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Emerging market business groups and firm risk: Effects of internal capital markets, corporate governance and capital structure

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எப்பொருள் யார்யார்வாய்க் கேட்பினும் அப்பொருள்
மெய்ப்பொருள் காண்ப தறிவு

In whatever matter and from whomever heard,
wisdom will witness its true meaning.

Thirukkural, Verse 423 (Thiruvalluvar, 132 BC) Translated by GU Pope, 1886

This thesis is dedicated to

Sameera Alexandrea

Aarti Laxmi

&

Sherrea Ophelia

Abstract

This thesis examines an important yet largely unexplored inner-workings of business group affiliation in emerging economies by exploring firm risk of group affiliates in comparison to their non-group firms. Using data for seven financial years the analysis focused on group affiliated firms and non-group firms in India, one of the largest emerging economies. The study is done in three phases. In the first study, the impact of business group affiliation on firm risk relative to non-group firms is examined. Followed by analysing if the difference between risk-taking by business-group affiliated firms and non-group firms depends on the relative size, sales revenue and cash flow of a firm within a business group, and finally on the relative bankruptcy risk of a firm. The second study extended the analysis by examining the impact of corporate governance on risk-taking, and the difference in the impact of these corporate governance variables between business group affiliated and non-group firms. The proxies for corporate governance include a wide range of board characteristics. Finally, the study extended the modelling of firm-level risk by considering the two-way relationship between risk and capital structure using a structural equation modelling (SEM) framework. The findings of the analyses suggest that 1)firm risk of both business group affiliates and non-group firms are defined by unsystematic risk (over 80%). 2)group affiliated firms' risk-taking are a)lower relative to non-group firms, b)highly dependent on the contribution of the affiliates towards overall groups' size, revenue and cash flow, c)financially safe firms assumes lower risk than financially distressed firms, 3)corporate governance is an effective mechanism to monitor firms in EMEs regardless of its organizational form, 4)firm risk and capital structure of both group affiliates and non-group firms are interlinked suggesting that both firms are likely pursuing strategy of reducing the likelihood of bankruptcy either by adjusting its capital structure or by adjusting the risk it bears.

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List of Abbreviations

EMEs	Emerging market economies
R&D	Research and Development
IFC	International Financial Corporation
IMF	International Monetary Fund
GDP	Gross domestic products

CHAPTER ONE :
INTRODUCTION

1.1 Background

A few fast growing and liberalising Asian and Latin American countries were identified as 'newly industrialising countries in the 1980s. However, this term was replaced by emerging market economies (EMEs) due to the widespread of liberalisation and adoption of market-based policies by the developing countries. EMEs are classified by International Monetary Funds (IMF) as middle-income countries that lack criteria such as market development, size and liquidity to be classified as developed economies. EMEs have been receiving growing attention since the early 80s because of their growing share in global trading and foreign direct investments. EMEs worldwide share certain characteristics, namely, weak institutions, market imperfections and market incompleteness. These characteristics often contribute to the high transaction costs for firms and it is argued that this results in concentrated ownership structures of firms, and formation of organisational structures such as business groups.

Literature on business groups describe business groups as confederations of legally independent firms that share multiples economic, social, formal and informal ties (Granovetter, 1995; Khanna & Rivkin, 2001) that take coordinated action (Khanna & Rivkin, 2001). Even though the firms within the groups are legally independent, they typically are horizontally and vertically connected. Firms' horizontal connections are such as cross-shareholding, interlocking directorship, while vertical connections are such as shared ownership and control (Elango, Pattnaik, & Wieland, 2016; Yiu, Bruton, & Lu, 2005). The divergence between control and ownership in business groups through pyramidal ownership structures and cross-holdings of shares are argued to be facilitating tunnelling activities by controlling shareholders.

Generally business groups are highly diversified, however, individual firms in each groups are more focused (Khanna & Palepu, 2000a) which facilitates resources including human capital reallocations. Early literature of Left (1978) argued that

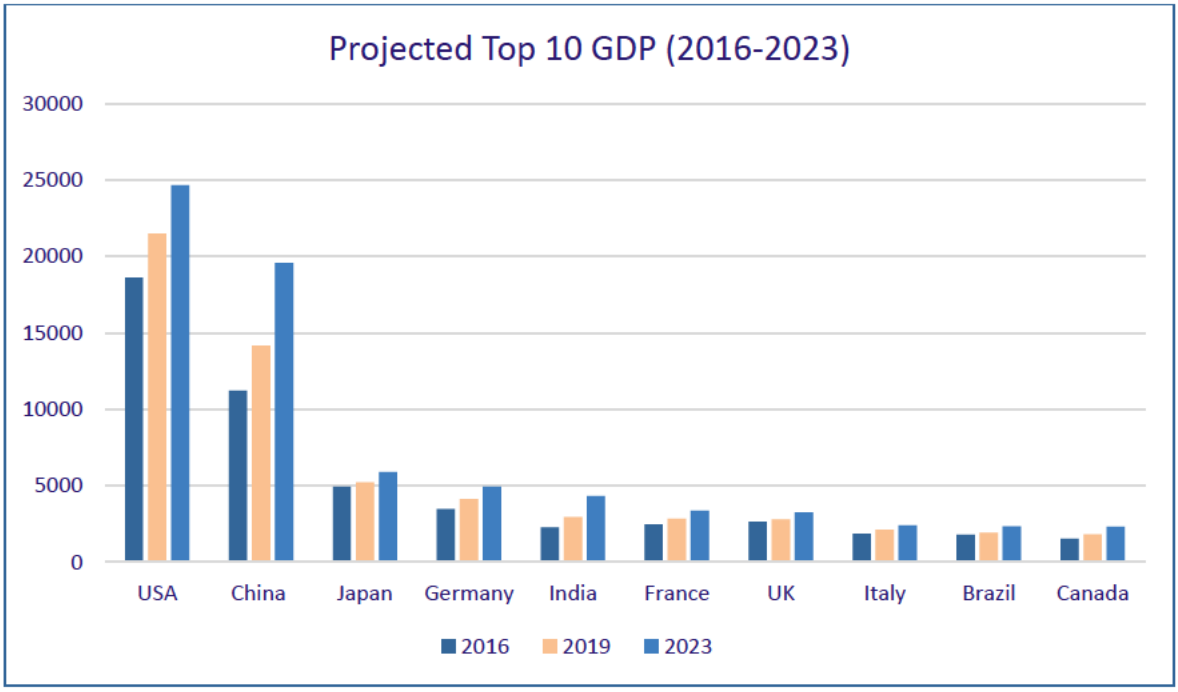
business groups serve three main functions. First, business groups are organisations structured in such way to appropriate quasi rents – which accrue access to imperfect markets of capital and information. Second, business groups are alternative to portfolio diversification in the absence of market for risk and uncertainty. Third, through use of vertical integration, business groups eliminate problems arising from bilateral monopoly and oligopoly. It has been argued business groups affiliation can reduce (certain kinds of) agency, bankruptcy and monitoring costs (Ferris, Kim, & Kitsabunnarat, 2003).

The context of this study, India, has a large population of both business group affiliated firms and non-group firms which have similar level of ownership concentration but only business groups have additional attributes such as internal capital market and co-insurance effect. Both types of firms are well represented by firms from sectors that are highest attractor of FDI such as services, computer software/hardware, telecommunications, construction, trading, automobile industry, chemicals, drugs & pharmaceuticals and power.

Further, risk landscape is ever evolving but risk management in emerging economies is still under-developed and especially in India is still very new. Hence, firms in India are more reliant on the existing mechanisms such as internal capital fund and co-insurance to address risk management issue. Risk Survey, 2018 conducted by Deloitte India's Risk Advisory in reports that in the last 3 years risk management practices are being widely adopted after firms view risk as a value enabling function.

In additional, business groups are ubiquitous in EMEs worldwide, especially in countries that are highest contributor towards world GDP. Three out of ten top EMEs in the world are Brazil, China and India (IMF, 2018). Figure 1.1 below reports the top ten global gross domestic products (GDP) illustrates that the top 3 countries contribute 29% towards overall global GDP and are predicted to be contributing one third (33%) of the overall GDP by 2023. In particular, India is among the top 5 countries as of 2016 and expected to overtake UK in 2019 and 2023 in terms of GDP. Meanwhile, according to IMF (2018) India is third largest country in terms of purchasing power

parity (PPP). According to statistics from Department for Promotion of Industry and Internal Trade, India, from April 2000 to March 2019, the cumulative foreign direct investment (FDI) in India was USD609.8 billion with service sector, computer, and telecom industry remains leading sectors for FDI inflows. This total FDI is enormous in comparison to some of the developed countries such as USA (USD25.6b), UK (USD26.8b) and Singapore (USD83b). Further, India's high growth rate since 2003 are reported to represent a structural increase rather than simply a cyclical upturn and are expected to continue to grow (Goldman Sachs, 2011).



International Monetary Fund World Economic Outlook @ 02/04/2018

Figure 1.1: The ten largest economies in the world by 2023, measured in GDP (billions of 2018 USD)

As discussed in the literature, the defining characteristic of business groups is their ability to move capital and other scarce resources such as managerial talent among member firms. Business groups pose an interesting intellectual challenge for researchers who are interested in both EMEs and the relationship between organisational forms and outcomes such as firm performance. On the one hand, features such as internal capital markets potentially add to the ability of business group affiliated firms to perform better, for example, by bypassing credit market frictions

(Khanna & Palepu, 2000a). By extension, business group affiliation makes bankruptcy less likely and, in principle, enables firms to be more entrepreneurial. On the other hand, reallocation of resources from successful firms within a business group to less successful ones (Meyer, Estrin, Bhaumik, & Peng, 2009) can create incentive problems for the former and moral hazard for the latter (Bhaumik, Estrin, & Mickiewicz, 2017). At the same time, it has been argued that business groups structures facilitate activities such as tunnelling (Bertrand, Mehta, & Mullainathan, 2002), and this adds to the considerable corporate governance challenge posed by ownership concentration that is common among both business group affiliated firms and their non-group counterparts (Bhaumik et al., 2017; Chacar & Vissa, 2005; Morck & Yeung, 2003).

Not surprisingly perhaps, much of the literature on business groups in EMEs contexts focus on firm performance and corporate governance issues. In this dissertation, we extend that literature by focusing on how business group affiliation affects risk-taking by firms. Risk is an important component of a firm's entrepreneurial orientation (Lumpkin, & Dess, 2001; Naldi, Nordqvist, Sjöberg, & Wiklund, 2007; Wiklund & Shepherd, 2005). In the context of Anglo-Saxon countries, discussion about risk is based on the premise that risk-taking reflects a corporate governance problem and, consequently, there is a large literature that examines how mechanisms such as remuneration contracts offered to managers – for example, inclusion of shares and share options in the remuneration packages – can influence firm-level risk. In EMEs, ownership concentration ameliorates the principal-agent or Type I agency problem, such that excessive risk-taking is perhaps less of a concern. Indeed, to the extent that ownership concentration coincides with family ownership of firms, it can be argued that the owner-managers of these firms are risk-averse (Bhaumik & Dimova, 2014) and consequently take less risk than what might be optimal from a strategic perspective.

In this dissertation, we take a fairly comprehensive look at risk-taking by business group firms. Our analysis is undertaken in the context of India, an EMEs which has a large population of both business group affiliated firms and non-group firms. First, we

examine how business group affiliation impacts the risk-taking, relative to non-group firms. We also examine whether the difference between risk-taking by business-group affiliated firms and non-group firms depends on the relative size of a firm within a business group, and on the relative bankruptcy risk of a firm. Second, we extend this analysis to examine the impact of corporate governance on risk-taking, and the difference in the impact of these corporate governance variables between business group affiliated and non-group firms. Our proxies for corporate governance include a wide range of board characteristics and takes advantage of a change to the corporate governance code in India which added clarity to the identity of independent directors. Finally, we extend the modelling of firm-level risk by considering the two-way relationship between risk and capital structure using a structural equation modelling (SEM) framework.

The aims and objectives of this thesis are described in section 1.2 to provide more details on these three major parts. The overall contributions of this dissertation are reported in section 1.3.

1.2 Aims and Objectives

The overall aim of this thesis is to investigate risk-taking behaviour of business group affiliated firms in emerging economies in comparison to non-group firms. The effects of ownership structure, corporate governance and capital structure of business group affiliated firms' risk. The sub-aims and corresponding objectives are presented in Table 1.1.

Table 1.1: Sub-aims and their corresponding objectives
This table presents the sub-aims and their corresponding objectives of this thesis

	Sub-aims		Objectives
1	Examine the impact of ownership and organizational form on firm risk and improve the understanding of how internal capital markets of business group affiliated firms affects firm risk	a	Identify the difference in firm risk of group affiliated firms in relative to non-group firms.
		b	Examine the risk-taking behaviour of group affiliated firms relative to their size within their respective group.
		c	Analyse the difference in firm risk of group affiliated and non-affiliated firms change when risk-taking is modelled in a behavioural finance framework i.e. when firms are financially distressed or safe
2	Investigate the effectiveness of corporate governance mechanisms in shaping the risk-taking behaviour of group affiliated and non-group firms that have similar high ownership concentration but different organizational form	a	Examine the effect of corporate governance attributes to firm risk of group affiliated and non-group firms
		b	Check on the robustness of the findings by examining the effect of corporate governance attributes to the firm characteristics identified in 1(b) and 1(c)
3	Employ Structural Equation Modelling (SEM) to examine the difference in two-way relationship between firm risk (unsystematic risk) and capital structure of group affiliated and non-affiliated firms	a	Develop a SEM model that captures the interlinks between firm risk and capital structure
		b	Analyse the effect of 2(a) on both firm risk and capital structure of group affiliated and non-group firms to confirm the robustness of the model
		c	Identify the role of relationship banking to firms' capital structure decisions

1.3 Contribution

This thesis on the relationship of business groups in emerging markets and firm risk contributes to the literature and knowledge of emerging market firms and business groups.

First, the thesis broadens the literature of business group that previously largely concentrated on performance of firms as a results of business group affiliation (Bhaumik et al., 2017; Chacar & Vissa, 2005; Khanna & Rivkin, 2001) by focusing on the impact of business group affiliation on corporate strategy.

Second, it contributes to the wider literature of corporate governance that had focused on the argument of principal-agent conflicts in the Anglo-Saxon context (Coles, Daniel, & Naveen, 2008; De Miguel et al., 2001; Ferreira & Laux, 2007), corporate governance as a mechanism improve performance (Anderson & Reeb, 2004; Burkart & Panunzi, 2006) previously. This thesis contributes in a specific way to address the deficiency in literature on the influence of corporate governance on firm risk in business group affiliated firms and non-group firms in developing economy.

Third, the thesis enhances the understanding on the two-way relationship between firm risk and capital structure of business group affiliation and non-group firms using Structural Equation Modelling (SEM) by incorporating the effect of corporate governance and relationship banking. Using SEM technique allow us to observe the two-way relationships and analyse determinants that are observable by multiple indicators.

Finally, the thesis extends the literature on emerging market by focusing on risk which a key component-indicator of corporate strategy. This extends the previous studies which were mainly on agency theoretic issues such as agent problems between majority and minority shareholders (Dharwadkar, George, & Brandes, 2000) and influence of ownership on firm performance (Kim, Kitsabunnarat, & Nofsinger, 2004).

1.4 Thesis Structure and Format

This thesis is prepared in a format where the empirical chapters (Chapter 3-5) consists of studies that is prepared and partly prepared for publication. These papers are formatted to fit the format of the thesis to aid continuity. Written permission from Faculty of Social Science to submit this thesis in the alternative format is attached in Appendix A.

Overall, this thesis consists of six (6) chapters including this introduction chapter. Chapter 2 is a literature review on the topic of sub-aims (1-3), followed by the three (3) empirical chapters (Chapter 3-5). The final chapter, Chapter 6, provides the overall conclusions and summary of the work described in the thesis.

CHAPTER TWO :
LITERATURE REVIEW

2.1 Emerging Market Economies

The term emerging market economies (EMEs) originated from the International Financial Corporation (IFC) classification of middle-income countries where foreign financial institute are allowed to buy securities. These countries lack a few criteria to be classified as developed. The criteria are economic development, size and liquidity as well as market accessibility[1]. According to International Monetary Funds (IMF), 23 countries are currently categorized as EMEs. This group of countries has been receiving growing attention since the early 1980's because of their increasing share in global trading and foreign direct investment. The contribution of EMEs to global economy is immense as the EMEs gross domestic products (GDP) constitute 32% of the global GDP[2].

EMEs traditionally lack in areas such as distribution systems, import restrictions, necessary capital and human resources (Hoskisson, Johnson, Tihanyi, & White, 2005). Besides the deficiencies in the aforementioned factors, missing or lack of market institutions also contributes to the high transaction costs for firms to operate in EMEs. EMEs have weaker property rights, weaker rule of law and weaker environment for contract enforcement compared to their developed country counterparts, not just at a point in time but persistently across time. Unsurprisingly, EMEs also have weaker environments of investor and credit protection.

As EMEs develop better market institutions, firms in EMEs benefit by enjoying lower transaction cost, having access to capital and other resources. However, despite having

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[1]MSCI Market Classification Framework (https://www.msci.com/documents/1296102/1330218/MSCI_Market_Classification_Framework.pdf/d93e536f-cee1-4e12-9b69-ec3886ab8cc8)

[2] Data obtained from World Bank Database (http://databank.worldbank.org/data/download/GDP.pdf) as of 2017.

reduced transaction costs and improved dynamic environmental conditions, persistent weaknesses with investors' protection discourages outside investors to actively invest on firm equity. The effect of weak investors' protections in most EMEs results in outside investors suffering from information asymmetry and control disadvantages (Hill & Jones, 1992). This makes ownership concentration the optimal strategy for investors, resulting in high ownership concentration in hands of a group of people, usually promoters of companies and their friends and family. In the words of Bhaumik and Dimova (2014): "*If the legal protection against expropriation of outside investors is good, the optimal outcome would be a widely held and professionally managed firm. If, on the other hand, protection of outside shareholders is inadequate, it would be optimal for the founder-entrepreneur (and hence the associated family) to remain involved, either as the target shareholder who would monitor the professional manager or as the owner-manager insider who may then be actively involved in expropriating the minority shareholders*." (pp. 12-13). In the Indian context, for example, promoter-individuals, their families and corporate bodies associated with the promoters are collectively the largest shareholder in 50.3 percent of firms, and they own more than 50 percent of the shares in more 37.98 percent of the firms (Bhaumik & Dimova, 2014; Table 1.3).[3]

In addition, market imperfections in EMEs make it optimal for a significant percentage of firms to be associated with wider business networks – "business groups" in the parlance of the literature (Ghemawat & Khanna, 1998; Khanna & Palepu, 1997; Peng & Delios, 2006). These networks, which are often diversified across different industries, provide the associated EMEs firms to overcome imperfections in market for resources such as credit and managerial talent. One of the consequences of the relationships among the firms associated with a network with diversified sources of revenue is that these firms benefit from internal markets for resources such as capital and managerial skills, which are either scarce or which are vulnerable to market

[3] The percentages were computed on the basis of a sample of 5,337 firms for which detailed ownership information were available in the *Prowess* database.

failures. As we discuss in the next section, this has important implications for firm behaviour.

Further, the ownership concentration in EMEs firms, for both business group-affiliated and unaffiliated firms, has implications for corporate governance in these contexts. As such, ownership concentration, and the consequent emergence of promoter-owner-managers (POMs), by its very nature, aligns the interests of the majority/controlling shareholders and upper level managers who take strategic decisions. As a result, in contrast to Berle & Means (1932) firms with dispersed ownership, the key agency conflict in these firms is not between the managers and shareholders, but between majority and minority shareholders. In the literature, this is known as principal-principal (as opposed to principal-agent) or Type II (as opposed to Type I) agency problem (Anderson, Mansi, & Reeb, 2003; Young et al., 2008). It is unclear, therefore, as to what extent stylized corporate government mechanisms that were developed to mitigate principal-agent or Type I agency problems are effective in these contexts (Bhaumik & Selarka, 2008). This, too, has implications for firm behaviour in EMEs contexts.

2.2 Business Groups

Business groups are a widespread phenomenon in many countries under various names, such as *keiretsu* in Japan, *chaebol* in Korea, *konzerne* in Germany and *Jituanqiye* in Taiwan. The characteristics of business groups may differ from country to country, but it is commonly defined as a group of legally independent firms that can be horizontally or vertically connected to one another. Horizontal connections include equity cross-ownership or interlocking directors and vertical connections through single ownership and controlled by controlling shareholders (Chang & Choi, 1988) or linked together through equity cross-ownership (Khanna, 2000). It has also been argued that firms affiliated to business groups are held together by interpersonal trust that is generally observed within kinship networks (Granovetter, 1995). Even though business groups exist in many countries, it is dominant form of organization throughout most emerging economies.

The literature on business groups in emerging economies has put forward explanations as to why business groups are a highly visible form of organization in EMEs. The transaction cost theory proposed by Williamson (1998) suggests that the optimal structure of a firm depends on its institutional context. As discussed above, the range and depth of institutional mechanisms that make market-based transactions easy in advanced economies are either absence or weak in emerging economies and this has been cited as one of the main reasons for the effectiveness of business groups in emerging economies. Consider, for example, the market for capital. If investor and creditor protection are weak, and so are contract enforcement mechanisms that underpin the ways (e.g., attaching collateral and forcing liquidation of assets on defaulting firms) in which firms overcome market failures on account of adverse selection, firms may have limited access to external capital markets, such that the internal capital market that is associated with business groups can gain in importance.

Similarly, emerging markets are characterized by missing markets for key resources such as managerial talent. It is now well understood that management practices are a key determinant of productivity and firm performance, and that firms based in developing countries (and, by extension, emerging markets) may be at a disadvantage because of poor management practices (Bloom, Mahajan, McKenzie, & Roberts, 2010; Bloom & Reenen, 2010). Indeed, it has been argued that "differences in management practices account for about 30% of total factor productivity differences between countries and within countries across firms" (Bloom, Sadun, & Reenen, 2017). It is also well understood that managerial talent may be scarce in emerging markets and that these markets are also characterized by labour market imperfections (Khanna & Yafeh., 2000). In these conditions, business group structures can create internal markets for scarce resources such as managerial talent that gives firms affiliated to these business groups a competitive edge over their competitors. This argument can be extended to include other resources such as technological resources that are scarce during early stages of development.

Business group companies, which are generally spread across a number of different industries (Khanna & Yafeh, 2007), also generate some other benefits for associated

companies. The diversification itself enables them to mitigate industry-specific risks in an environment that is characterized by market incompleteness, i.e., inability to hedge risks through appropriate use of insurance contracts. It has been argued that business group affiliated firms are co-insured against financial distress or bankruptcy (Claessens, Fan, & Lang, 2006) by other affiliates within the group. However, the evidence regarding risk sharing is mixed (Khanna & Yafeh, 2005), such that this may not be the most important reason for existence of business groups. But there are other benefits from diversification. For example, where such diversification leads to presence of affiliated firms in both the upstream and downstream industries, resulting in de facto vertical integration within the business group that connects their main manufacturing firms with other affiliated firms which supply raw materials and intermediate goods and services (Chang & Hong, 2002), the relevant companies can also benefit from lower transactions cost associated with inter-firm contracts. Where institutions are weak and contracts are incomplete, there are also benefits associated with retaining the residual rights of control within the business group structure (see Hart, 1995).

As such, in contexts that are characterized by weak institutions, market imperfections and market incompleteness, business group is more relevant organization form as they can internally generate capital, reallocate capital and resources including human resource among the affiliates. Firms in emerging economies may need to rely heavily on network and relationship-based strategies, hence, developing the ability to enforce contracts, which with business affiliations can now be done informally (Meyer et al., 2009). In such volatile environment, group affiliation may enhance firms' ability to secure resources through non arms-length transaction and still implement internal contracts without depending on law enforcements (Filatotchev & Mickiewicz, 2001). Kim (2003) has argued that the most important benefit possessed by group affiliates due to having internal capital markets is the capability to internalise transaction cost, and this argument can be generalised to include other resources that are key to a firm's competitiveness. To reiterate, therefore, firms' ownership structure in a given context

is an equilibrium response to the country's development (or underdevelopment) of its institutions, legal environments and market frictions.

The advantages of business groups in reallocating capital among its affiliates through internal capital market not only improves economic efficiency but also done more efficiently than the underdeveloped external capital market (Khanna & Palepu, 2000a, 2000b). The importance and benefits of business groups in emerging economies have been much discussed in the literature (Chang & Hong, 2002; Claessens et al., 2006; Ferris et al., 2003; Khanna & Palepu, 2000a, 2000b; Khanna & Yafeh, 2007). Affiliation with Japanese keiretsu was shown to reduce agency, bankruptcy and monitoring costs and liquidity constraints (Ferris et al., 2003). Khanna and Palepu (2000) too reports that group affiliation addresses agency problems. These advantages can result in outcomes such as better risk management (Bhaumik et al., 2017) and greater R&D activities (Chang, Chung, & Mahmood, 2006; Sasidharan, Jijolukose, & Komera, 2015) for business group affiliated firms.

However, there are also weaknesses or costs associated with business group affiliations, in particular, because of moral hazard created by the internal capital market. For example, it has been demonstrated that business group affiliated firms have greater persistence of poor performance (Chacar & Vissa, 2005), and are less likely to experience technological progress (Bhaumik & Zhou, 2014). Business groups also indulge in unrelated (and hence inefficient) diversification (Kock & Guillen, 2001), redistribute cash to financially weaker firms within the group which results in negative spill overs for other group-affiliated firms (Gopalan, Nanda, & Seru, 2007), and have lower returns on investment of their retained earnings (Bhaumik et al., 2017). In addition, it has been argued that where ownership structures lead to conflict between majority and minority shareholders, business groups may expropriate minority shareholders using mechanisms such as tunnelling (Bertrand, Mehta & Mullainathan, 2002; Baek, Kang & Lee, 2005; Kali & Sarkar, 2011).

This, in turn, has led people to question the efficacy of these organizational structures as institutional environment improves in emerging market economies, as robust

markets emerge for erstwhile scarce resources, and as it becomes increasingly possible to hedge against risk using insurance contracts. Khanna & Palepu (2000) argue that in emerging market contexts such as Chile the benefits that are not associated with diversification weakened over time; "the evolution of institutional context alters the value-creating potential of business groups, albeit slowly" (pp. 268). In the same vein, Bhaumik, Das, & Kumbhakar (2012) find that with financial sector development in contexts such as India the advantage associated with business groups – specifically, how business group affiliation ameliorated financial constraints of firms – weakened over time. More damningly, a recent meta-analysis Carney *et al.*, (2011), suggests that even when institutions are weak, it may not be easy to make a case for the existence of business groups. Overall, group affiliation is shown to be outperforming unaffiliated firm in countries where institutional development is high (e.g. Singapore, Hong Kong, Sweden and Malaysia). By contrast, in countries with institutional void, there are mixed findings on the performance of group affiliated firms compared to unaffiliated firms. A business group's ability to adapt to changing institutional contexts, in particular, may depend on the strength of the state and the extent to which state's facilitate this adaptation process (Carney, Van Essen, Estrin, & Shapiro, 2018).

In conclusion, while business groups may have a role to play in EMEs in the early stages of their development, when institutions are weak, and markets are imperfect and/or incomplete, it is unclear as to whether these organizational forms are optimal as institutions and markets in EMEs develop over time. Specifically, it is unclear as to whether the peculiarities of business groups are conducive to strategic decision-making about key issues such as risk-taking. We shall revisit this issue later in the dissertation.

2.3 Ownership Concentration

As mentioned earlier, EMEs firms are also characterized by significant ownership concentration. Following the pioneering work of La Porta et al. (1997, 1998), it has been argued that concentrated ownership of firms is driven by weak shareholder protection. Specifically, in the absence of strong shareholder protection, an investor's

ability to extract a return on her investments depends on her control over a firm which, in turn, depends on share concentration in her hands. In other words, legal shareholder protection and legal shareholder concentration are substitutes. Burkart & Panunzi, (2006) have argued that this is not necessarily the case; "[i]n particular, when the law is a substitute for monitoring, legal protection and ownership concentration can be complements" (pp. 2). However, the La Porta et al. (1997, 1998) explanation for ownership is widely accepted, and the importance of legal institutions is further strengthened by studies that suggest, for example, that while ownership concentration is unaffected by disclosure standards, this concentration is lower in countries in which the burden of proof is lower for legal action against auditors (Guedhami & Pittman, 2006). In EMEs, ownership concentration often coexists with family control (Bhaumik & Dimova, 2014), but this need not always be the case.

Ownership concentration of firms in EMEs help resolve the stylized principal-agent problem in widely held firms (Berle & Means, 1932; Jensen & Meckling, 1976), but they give rise to their own array of agency problems. Specifically, where concentration of ownership coincides with majority shareholding by an investor (or a group of investors acting in unison), firms are characterized by the so-called Type II agency problem (Villalonga & Amit, 2006) or the principal-principal problem (Young, Peng, Ahlstrom, & Bruton, 2002; Young et al., 2008). The controlling owners have the incentive to expropriate minority/outside shareholders to derive minority shareholders of their rights and gain private benefits of control in return, and since they may have the right to decide how the firm is run and how the profits are distributed (Claessens & Fan, 2002), minority shareholders are exposed to the possibility of expropriation. Evidence of expropriation of minority shareholders in firms that are controlled and managed by dominant/majority shareholders have been reported in the literature (Singla, Veliyath, & George, 2014). The problem of expropriation is expected to be particularly acute in firms in which there is significant divergence between the cash flow rights and control rights of these majority/controlling shareholders (Claessens, Djankov, Fan, & Lang, 2005).

In principle, while ownership concentration may result in expropriation of minority shareholders, where the majority shareholders are also the managers making strategic decisions – an example of which is family firms – one would expect amelioration of the principal-agent problem. More generally, since large shareholders have significant incentive to monitor the managers, they overcome the collective action problem experienced by outside investors in widely held companies, and hence the managers in these firms are better monitored (Alchian & Demsetz, 1972). Hence, in principle, one would expect that ownership concentration would result in better firm performance.

At the same time, majority (or controlling) shareholders are entrenched and are, therefore, less accountable to minority shareholders and other stakeholders of the company. This, in turn, may result in poor decision-making, or decisions that augment the private benefits of the majority shareholders at the expense of others. Filatotchev and Mickiewicz (2001) find that concentrated ownership may lead to less efficient use of financial resources. Similarly, Bhaumik & Selarka (2012) find that M&A decisions by firms with Type II agency problems do not necessarily result in post-M&A value addition (but the literature suggests that the relationship between ownership concentration and M&A outcomes may be mixed (Craninckx & Huyghebaert, 2015). These firms can also be risk averse, given the exposure of the majority shareholders in a single enterprise (García-Marco & Robles-Fernández, 2008), which can result in outcomes such as reduction in product diversification (Hill & Snell, 1988) – more generally, less diversification (Amihud & Lev, 1999) – and less internationalization (Bhaumik, Driffield, & Pal, 2010). These problems can be even more acute where ownership concentration coincides with family control (Bhaumik & Dimova, 2014).

In conclusion, therefore, while ownership concentration in EMEs firms may result from weak investor protection, and while ownership concentration may ameliorate the principal-agent problem that characterizes widely held firms, ownership concentration itself may result in distorted incentives that may adversely affect strategic decisions of firms and expropriation of minority shareholders. Where ownership concentration coexists with business group structures, the ability to expropriate, in particular, may

increase with business group affiliation that facilitates tunnelling. Business group affiliation also facilitate greater entrenchment of majority investors (who may also serve as managers,) by way of mechanisms such as pyramidal ownership (Almeida & Wolfenzon, 2003). At the same time, the incentive structures within the firms may be further distorted by access to the internal market for capital, in particular, and strategic resources, more generally; specifically, by the ability of business groups to insure affiliated firms against idiosyncratic negative shocks and the moral hazard associated with such insurance.

2.4 Corporate Governance in Emerging Market Economies

A narrow definitions of corporate governance focuses on the relationships between firm managers, the board of directors and firm's shareholders as defined by Shleifer & Vishny (1997) in their seminal review as the element that "deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment" (p.737). Meanwhile, broader descriptions include the relationship of the firm to all its stakeholders and society that enable firms to attract capital, perform efficiently, generate profits and meet legal obligations and general society's expectations. The boarder definitions corresponds to Sir Adrian Cadbury, head of Committee on the Financial Aspects of Corporate Governance in the United Kingdom definition of corporate governance as "the system by which companies are directed and controlled" (Cadbury Committee, 1992).

The Anglo-Saxon approach clearly refers to corporate governance as the set of mechanisms practiced by firms when ownership is separated from management and also concerned with the fiduciary responsibilities of managers and directors of the firm to act on the best interest of shareholders and maximise shareholder value. With the separation of ownership and management, the agency problems of shareholders in firms in diluted ownership are two-folds. First, shareholders are concern that management will be interested with its own rent-seeking behaviour and second, the board members may cater to the interests of particular groups including the management rather than protect the interests of the shareholders. The literature also

suggests that designing optimal contracts that align interests of managers and shareholders may not be easy (Grossman & Hart, 1986; Holmstrom, 1999), and that use of executive compensation packages to manage managerial moral hazard may not be easy (Garen, 1994; Grinstein & Hribar, 2004) especially when CEOs and others in the upper management can influence their own compensation packages. Correspondingly, corporate governance system practiced worldwide is designed to mitigate these problems and align the behaviour of all parties with the best interests of shareholders. The mechanisms implicitly involve a threat that managers who do not work in the interests of the shareholders can be removed, even though powerful managers can protect themselves by ensuring that golden parachutes are triggered at the time of termination of employment (Wade, O'Reilly, & Chandratat, 1990). Use of golden parachutes are more likely in contexts where ownership concentration is high, such that the threat of removal of managers is more credible (Falaschetti, 2002).

These set of corporate governance mechanism may be effective in protecting shareholder interests and reduce agency costs in countries where principal-agent problems are prevalence. However, they are unlikely to be a panacea for corporate governance in emerging market contexts. As we have noted above, a striking feature of firms in emerging market economies is the concentration of ownership in the hands of affluence family or business groups (Khanna & Palepu, 1999). The lack of participation of outside investors due to institutional void and weak investor and creditor protections (Bhaumik et al., 2017), most of the firms in emerging market economies are either part of business groups or privately owned and controlled by families with shareholding between forty to sixty percent. The dominance of these types of firms alter both the nature of conflict within firms, and the credibility of any threat to remove incumbent managers.

Extensive family ownership and control, business group structures and weak legal protection of minority shareholders in emerging economies (Young et al., 2008) denote that the traditional agency problems between principal-agent in firms with dispersed ownership is now replaced with principal-principal conflicts. This type of agency problems known as type II agency problems is the possibility of majority

shareholders expropriating minority shareholders. In fact, Claessens et al., (2002) in their study on ownership structure conclude that the main corporate governance problem in emerging markets is the expropriation of minority shareholders by controlling shareholders. La Porta, Lopez-de-Silanes, Shleifer, & Vishny, (2002) also find that outside (minority) shareholders are prone to be expropriated by controlling (majority) shareholders in countries with weak investors protections. At the same time, given that the managers in these firms are, in most cases, inseparable from the majority shareholders, such that these managers are entrenched and cannot be removed through minority shareholder action and market discipline. The type II agency problems require remedies, in the form of corporate governance that is different from the one that mitigate the classic principal-agent conflicts.

All of the afore-mentioned arguments raise the question if the dynamics of the existing corporate governance mechanisms - a predominant product of the developed country, are efficient in alleviating type II agency conflicts by effectively monitoring and improving firm practices and subsequently achieving their strategic goals. The literature is divided in its opinion about this issue. Some researchers, for example, have argued that in countries such as China, while CEO duality and presence of foreign shareholders (who presumably have a greater incentive to monitor the management) have the expected impact on market valuation of firms, key factors influencing this market value may be related to shareholding concentration of the largest shareholder and the non-controlling blockholders (Bai, et al., 2004). Similarly, Gibson (2003) Gibson find that while firm performance and CEO turnover are not unrelated in emerging market economies, there is no link between firm performance and CEO turnover in firms that have large domestic shareholder. Indeed, it has been pointed out that the effectiveness of corporate governance models in emerging market contexts may depend on the institutional context in which they are adopted and informal institutions, in particular, may play an important role in determining their effectiveness (Globerman, Peng, & Shapiro, 2011). This is consistent with the argument of Allen (2005) that factors such as trust and reputation may be more useful at driving corporate governance in emerging market economies than law-based mechanisms.

Akin to the ownership structure of firms in most emerging markets around the world (La Porta, Lopez-de-Silanes, & Shleifer, 1999), Indian listed companies are characterised by a high degree of ownership concentration, and presence of large majority-controlling shareholders. Indeed, both group-affiliated and unaffiliated firms are predominantly family or business group-controlled with high ownership concentration. At the same time, business group companies have the capacity and perhaps even the incentive to expropriate minority shareholders using mechanisms such as tunnelling (Bertrand et al., 2002; Kali & Sarkar, 2011).

Given the different characteristics of the affiliated and unaffiliated firms in India, it provides a natural setting to examine the effect of corporate governance mechanisms on group-affiliated and unaffiliated firms that have equal ownership concentrated but dissimilar ownership structure. Khanna & Palepu (1999) find that external monitoring of group affiliates is more problematic than that of unaffiliated firms. The authors highlighted the opaqueness of business group structure provides the opportunities for business groups to engage in questionable practices to the detriment of minority shareholders. Majority or the controlling shareholders are likely to be directly involved in the operational management which gives them large discretions over firms' strategic decisions (Cronqvist & Nilsson, 2003). However, corporate governance facilitates strategic decision making by firms whereby the board of directors is in a position to make sure the management works to serve the interests of minority shareholders and safeguard them being expropriated by majority shareholders. The findings are particularly interesting for this study as it raises the question if the internal monitoring in the form of corporate governance (board of directors in this case) plays a different role in shaping the risk-taking behaviour of the different types of firms.

2.5 Firm Risk

Expansive literature on the effect of ownership types and structure on its financial and strategic implications generally takes ownership structure as given (Claessens et al., 2002; M Faccio, Marchica, & Mura, 2011; Fahlenbrach, Low, & Stulz, 2010; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; Low, 2009) and very much focused in

Anglo-Saxon countries (Cronqvist & Nilsson, 2003; Dalton, Hitt, Certo, & Dalton, 2007; Grossman & Hart, 1980; Jensen, 1986; Jensen & Meckling, 1976; Morck, Shleifer, & Vishny, 1988). Much discussion and research on ownership structure focused on the agency relationship between owners and managers in widely held firms (Bebchuk & Fried, 2003; Burkart & Panunzi, 2006) and the effect of ownership structure on firm performance (Agrawal & Knoeber, 1996; Andres, 2008; Coughlan & Schmidt, 1985; Demsetz & Villalonga, 2001; Kocenda & Svejnar, 2002) owing to the agency problems due to managers' failure to act in the interests of shareholders . However, this type of agency problem, known as Type I agency problem, is more prominent in Anglo Saxon countries then in developing countries (Sraer & Thesmar, 2007).

This phenomenon is not widespread in the developing countries because of lack of strong institutions to protect minority shareholders and enforce contracts (Friedman, Johnson, & Mitton, 2003). Incongruent to the vast literature from the Anglo-Saxon economies where agency conflicts take the prominent role in explaining the divergence and conflict of interests between the owners and the insiders on firm strategic decision making, in developing economies, most large firms are parts of business groups or family firms with high ownership concentration with a family or the founder of firm holding control blocks in several publicly traded firms. Firms in the EMEs have higher ownership concentration. Hence, the convergence of ownership and control of owners and insiders, mitigates if not eliminates the type I agency problem suffered by firms with diluted ownership. However, such ownership structures bring about their own sets of problems (Morck & Yeung, 2003).

Family firm scholars have found that another form of agency problems, known as Type II agency problem, pose a threat to firms with concentrated ownership such as family firms and business groups. The divergence of interests of majority and minority shareholders is identified as the ground for the problems (Madison, Holt, Kellermanns, & Ranft, 2016; Villalonga & Amit, 2006). Gómez-mejía et al. (2007) suggest that controlling family shareholders often pursue noneconomic goals at the expense of financial gain (Gómez-Mejía et al., 2007). For example, family firms and business

groups divert their resources within the group to pursue noneconomic agendas that may results in negative impact of affiliates firm performance, thus creating conflict between family and non-family shareholders.

Ownership concentration measures the power of controlling shareholders that are also the strategic decision makers of the firm or have the capacity to influence the firm's corporate decisions makers. High level of insiders shareholding has implications towards corporations objectives and the way they exercise their power, and this is reflected in company strategy with regard to profit goals, dividends, capital structure, growth rate (Thomsen & Pedersen, 2000). Figure 2 in Appendix A provides the break-up of the shareholding and ownership across the year of the sample of this study which account for 64% of the total manufacturing firms in the Bombay Stock Exchange and National Stock Exchange. It is evident that the average shareholding of "promoters" in Indian companies is 50% or even more and group firms have higher promoter's shareholding compared to non-group firms. In this context, it is important to recognize how the differences in the structure of ownership and control among the different firms influence firm behaviours, especially firm risk-taking behaviour. Examining the link between ownership concentrations and firm risk is one way to gauge the non-financial implications of ownership concentration on firm behaviour, specifically firm risk.

Existing theories propose a straightforward relationship the high ownership concentration and firm strategies. Since large shareholders, in this case business groups, pursue their own interests, they may seek to expropriate other minority shareholders by diverting firm resources for their own use or pledging funds in unprofitable project to gain personal benefits. The incentives for large shareholders to engage in such activities are severe due the excess of control rights over cash-flow rights. These activities cause surge in the asymmetry of information between the insider and outside shareholders causing the lack of participation of external shareholders.

Understanding firm risk-taking behaviour is both compelling and important in many ways. Studying firm risk-taking behaviour is crucial as it is stated as the fundamental

driver of performance (Khanna & Yafeh, 2005; Miller & Bromiley, 1990), growth (John, Litov, & Yeung, 2008), innovativeness and entrepreneurial orientation (Lumpkin & Dess, 2001; Naldi et al., 2007; Wiklund & Shepherd, 2005). However, firm risk-taking is also an indicator of the financial health of the firm as excessive risk-taking is believed to have led firm into financial distress and eventual solvency (Acharya, Bharath, & Srinivasan, 2007; Samarakoon & Hasan, 2003). It also offers an overview of firm's financial health that could signpost the possibilities of a firm heading for financial distress/bankruptcy. Both academicians and practitioners studying firm risk-taking behaviour in the wake of global financial crisis in 2007 identified excessive corporate risk-taking as one of the elements contributing to the crisis.

Nevertheless, risk despite being an indicator of instability in firm returns, is considered as one of the dimension for entrepreneurial orientation (Choi, Zahra, Yoshikawa, & Han, 2015; Fisher & Hall, 1969; Zahra, 2005). The authors perceive entrepreneurs to have more positive attitude towards risky choices and growth orientated than non-entrepreneurs. Entrepreneurs making innovative and proactive choices are expected to generate greater return, parallel with the CAPM theory that greater risk generate greater return, as supported by many empirical and theoretical research (Brealey & Myers, 1981; Brick, Palmon, & Venezia, 2015; McNamara & Bromiley, 1999). Although it is clear that undertaking risk is essential for entrepreneurs to be innovative, venture into new business and remain competitive, empirical evidence suggest that excessive risk-taking may lead to bankruptcy. John et al., (2008) in their study on the relationship of corporate governance and risk-taking point out that firm risk-taking choices and magnitude are criterions for regulators to consider for effective policy-making and improving investor's protection.

CHAPTER THREE :
ORGANIZATIONAL FORM AND FIRM RISK

ABSTRACT

This study provides evidence on an important yet largely unexplored impact of business group affiliation on firm risk-taking in comparison to standalone non-group firms in emerging economy. Using firm level panel data of Indian listed manufacturing firms, the panel regression analysis finds strong evidence that group firms are negatively related to total risk and unsystematic risk compared to non-group firms. Both group and non-group firms are strongly characterized by unsystematic risk as it accounts for up to 81% of total risk. However, group firms' total risk and unsystematic risk are significantly lower than non-group firms and this characteristic of group firm can be contributed to the co-insurance effect exclusive to group firms. Conversely, the risk-sharing function may not provide a blanket benefit across the group considering the ability of each affiliate to provide co-insurance coverage depending on the weightage of affiliates' size, sales revenue and cash flow weight against overall groups. Exploring the risk-taking behaviour of both ownership types facing the risk of bankruptcy, this study finds that financially distressed firms both of group and non-group undertake higher risk than similar type healthy firms. Taken together, the statistically and economically significant results show that while ownership concentration of both types of firms reduces type I agency problems, it is evident that the co-insurance factor and ability to share risk across the group enable certain affiliated firms to assume higher risk while smoothing the risk across the group.

Keywords: emerging market, group affiliation, risk-taking, bankruptcy risk.

3.1 Introduction

As argued earlier in this paper, risk-taking lies at the heart of corporate decision-making. On the one hand, it is considered to be an integral part of a firm's entrepreneurial orientation (Lumpkin and Dess, 1996). It has been argued, for example, that in organizations such as family firms "risk-taking is a distinct dimension of entrepreneurial orientation …. and that it is positively associated with proactiveness and innovation" (Naldi et al., 2007; pp. 33). On the other hand, risk-taking has implications for likelihood of bankruptcy, with its attendant costs.[4] Some scholars argue that risk-taking is not necessarily associated with better firm performance and that, indeed, risks taken by firms often have low returns (Bromiley, 1991). Unsurprisingly, therefore, there is a large literature that examines that determinants of risk-taking in firms.

A significant part of the literature on risk-taking focuses on the familiar agency conflicts within firms, and de facto posits risk-taking is a function of the mechanisms that are used to mitigate these agency conflicts. The strand of the literature has focused on managerial compensation (Armstrong & Vashishtha, 2012; Coles, Daniel, & Naveen, 2006; Low, 2009; Rajgopal & Shevlin, 2002), shareholder power (Laeven & Levine, 2009), institutional equity ownership and blockholders (Wright, Ferris, Sarin, & Awasthi, 1996) board structures (Pathan, 2009), and the corporate governance environment (Acharya, Amihud, & Litov, 2011; Bargeron, Lehn, & Zutter, 2010; John et al., 2008). Another strand of the literature has focused on firm ownership. For example, it has been argued that "firms controlled by large diversified large shareholder undertake riskier investments than firms controlled by nondiversified large shareholders" (Mara Faccio, Marchica, & Mura, 2016). Similarly, in the context of the thrift industry, it has been argued that stock thrifts, for which fixed and residual claims are separable, take more risks than mutual thrifts (Esty, 1997). As such, this

[4] Correspondingly, it has been argued that "the primary goal of risk management is …. to provide protection against the possibility of *costly lower tail outcomes* – situations that would cause financial distress or make a company unable to carry out its investment strategy"(Stulz, 1996).

line of analysis suggests that risk-taking behaviour of owners depends on the nature of their liability – limited vs unlimited – and their ability to diversify the risk associated with their stock holding in firms.

The literature heretofore is not particularly useful for scholars who focus on emerging market firms. These firms often have significant ownership concentration (Mitton, 2002), such that Type I agency problem between managers and owners is limited and owner-managers are generally entrenched (Bhaumik & Selarka, 2012). In these firms, there is considerable evidence of Type II agency conflict between majority and minority shareholders, and corporate governance mechanisms such as boards are typically ineffective (Fan & Wong, 2005; Young et al., 2008). In other words, in these contexts, risk-taking by firms is likely to be influenced largely by the incentives of the owner-managers. At the same time, given that a vast majority of these firms are family owned-controlled, factors such as residual risk bearing by the owners, and their ability to diversify their asset portfolio across stocks of multiple firms is likely to have a weaker influence on the risk-taking decision, given the significant non-monetary costs of bankruptcy of these firms for the owners (Bhaumik & Dimova, 2014; Shepherd, Wiklund, & Haynie, 2009; Zellwenger & Astrachan, 2008). In other words, we need a new conceptual framework to examine risk-taking behaviour of emerging market firms.

In this chapter, we take advantage of the co-existence of two types of emerging market firms – those affiliated to business groups and those that are unaffiliated, with similar ownership structures but different organizational forms, and posit that in these contexts differences in risk-taking can be explained by differences in organizational structures, after we control for other possible factors. Specifically, we argue that business group affiliation creates a particular set of incentives of managers that influence risk-taking by these firms. In particular, managers of business group affiliated firms trade off the moral hazard associated with the coinsurance facility available to group affiliated firms, whereby a distressed affiliated firm is bailed out by other firms affiliated to the group, with the paucity of incentives to take risks, given that extra returns associated with risk-taking may not accrue to the risk-taking

firm/managers and may instead be transferred to other group affiliated firms through internal capital markets. We hypothesize that, on balance, business group affiliated firms would take less risk than their unaffiliated counterparts. We examine this hypothesis using data from India where privately-owned business group affiliated firms co-exist with privately-owned unaffiliated firms and take into consideration factors such as the relative importance of a firm to the overall business group, and behavioural factors such as influence of the likelihood of bankruptcy on firm-level risk-taking. Our hypothesis finds robust support in the data: business group affiliated firms bear less risk than unaffiliated firms.

We contribute to two different literatures. First, our paper significantly extends the literature on emerging market firms, which largely focuses on agency theoretic issues such as expropriation of minority shareholders by majority shareholders (Dharwadkar et al., 2000), and the influence of ownership on operating performance (Kim et al., 2004), by focusing on risk, which is a key component-indicator of corporate strategy. Specifically, our paper extends the line of inquiry about the impact of ownership and organizational form on firm strategy such as internationalization that carry a significant amount of risk (Bhaumik et al., 2010). Second, we extend the growing literature on business groups which is largely focused on the performance impact of business group affiliation (Chacar & Vissa, 2005; Estrin, Poukliakova, & Shapiro, 2009; Khanna & Palepu, 2000a, 2000b; Khanna & Rivkin, 2001; Yiu, Bruton, & Lu, 2005), and specific forms of expropriation such as tunnelling (Bae, Kang, & Kim, 2002; Baek, Kang, & Lee, 2006; Bertrand et al., 2002) by focusing on the less discussed issue of the impact of the incentives associated with the business group structure on corporate strategy. Specifically, our paper extends the line of inquiry about the impact of business group affiliation on strategic decisions such as R&D investment (Bhaumik & Zhou, 2014; Chang et al., 2006; Mahmood & Mitchell, 2004), corporate refocusing (Hoskisson et al., 2005), and external orientation (Vissa, Greve, & Chen, 2010).

3.2 Hypotheses Development

As noted by Khanna & Yafeh (2007), business groups are ubiquitous in EMEs. It is often argued that this organizational form is a response to weak institutions and missing markets in emerging economy contexts (Friedman et al., 2003; Ghatak & Kali, 2001). This view suggests that business groups mitigate the problems associated with missing markets for key resources – capital, in particular – by creating internal markets for affiliated firms. The liquidity risk associated with this internal capital market, which is correlated with group-wide cash flows, is mitigated by the diversification of business groups across industries. The liquidity provided by internal capital markets, in turn, facilitate the ability to diversify and enter new markets, thereby creating a virtuous circle. Even when capital markets in emerging market contexts are liberalized, the advantages associated with internal capital markets do not always disappear, often because of persistent high transactions cost associated with external capital markets (Khanna & Palepu, 1999, 2000b)

Kim, Hoskisson, Tihanyi, & Hong (2004) argue that in order for business groups to benefit from their internal capital markets, they should adopt a competitive M-form structure. In this organizational form, managers of individual divisions or business units within a business group have full autonomy and cash flows to these divisions/units are allocated by the group on a competitive basis. In other words, in the competitive M-form set up, the internal capital market of a business group mimics the market disciplining role of the (imperfect or missing) external capital market. The alternative to the competitive M-form structure is the cooperative M-form structure whereby capital (and other scarce resources such as managerial skills) are shared by the divisions or business units. Available evidence suggests that internal capital markets – more generally, sharing of scarce resources through internal markets – do exist within business groups (Chang & Hong, 2000; Lamont, 1997; Shin & Park, 1999).

Evidence regarding the efficiency of internal capital markets is mixed, with some research suggesting that they allocate capital efficiently across affiliated firms (Almeida, Kim, & Kim, 2015; Khanna & Tice, 2001), and others suggesting that these

markets do not allocate capital efficiently (Almeida & Wolfenzon, 2003; Chang & Hong, 2000; Estrin et al., 2009; Scharfstein, 1998). However, while capital may or may not be allocated across divisions and business units within business groups on the basis of the returns of the associated projects, evidence suggests that business groups divert resources to affiliated weaker firms that could go bankrupt in the absence of this support (Dewaelheyns & Van Hulle, 2006; Gopalan, Nanda, & Seru, 2014). A key reason for support is to mitigate possible negative externality of a business group affiliated firm's bankruptcy for access to external capital and cost of capital of other firms within the same business group. With some notable dissent (Khanna & Yafeh, 2005), coinsurance within business group structures is stylized in the literature on business groups (Byun, Choi, Hwang, & Kim, 2013; Fisman & Wang, 2010; Jia, Shi, & Wang, 2013).

This coinsurance has two different implications for ability and willingness of firms affiliated to business groups to take risks, relative to unaffiliated or independent firms. On the one hand, as discussed above, coinsurance reduces bankruptcy cost and thereby makes it more feasible for business group affiliated firms to take risk. On the other hand, if higher returns associated with successful risk-taking does not accrue to the risk-taking firms and is, instead, distributed to weaker firms through internal capital markets, then managers of business group affiliated firms might be less willing to take risks that are, on average, associated with higher return. This would especially be true in contexts where firms, business group affiliated or otherwise, are largely family-owned such that, on the one hand, managers related to the controlling family by way of kinship are less likely to be severely penalized for taking risks that cause financial distress, and, on the other hand, compensation for managers of an individual business-group affiliated firm may be weakly related (or unrelated) to financial performance of the firm.[5] Evidence suggests that while business group affiliated firms are better able to mitigate the negative impact of risk-taking on firm performance than their

[5] It has been demonstrated, for example, that family CEOs of family firms receive lower compensation than non-family CEOs (Gomez-Meija, Larraza-Kintana and Makri, 2003). Indeed, the family CEO's compensation decreases with family concentrated and is more insulated from risk.

unaffiliated or independent counterparts, managers of the business group affiliated firms are less entrepreneurially "proactive" (Bhaumik et al., 2017).

It is possible to argue, of course, that risk-taking by individual affiliated firms within a business group may be a group-level decision rather than a firm-level decision, such that incentives of firm-level managers do not matter. However, any contract between a business group and an affiliated firm is necessarily incomplete, especially when the group-level and firm-level management are part of the same kinship network, and thereby ex post (Hart & Moore, 1990). Further, the transactions cost associated with enforcing the initial contract and ex post state verification could increase considerably in the presence of informational asymmetry – whereby firm-level management know more about the risk implications of their decisions than the group-level management – "even when parties share organizational goals" (Holmstrom & Tirole, 1989). The problem can be made even more complicated by interaction between unforeseen contingencies and informational asymmetry (Tirole, 1999). Where business groups are also family owned, this problem can, in principle, be mitigated by allowing the patriarch/matriarch of the family to be an arbiter of the ex post dispute, but in family firms punishment for breaching the initial contract about risk-taking may not be credible (Bhaumik & Dimova, 2014).

In light of this discussion, we posit the following:

Hypothesis 1 (H1)**:** *Business group affiliated firms would take less risk than their unaffiliated or independent counterparts.*

Thus far, in our discussion, we have implicitly assumed that firms affiliated to a single business group are homogenous, which is inevitably not the case. For example, for the financial year ending in 2017, the total revenue of the India Hotels Company Limited was INR 24.45 billion, while that for Tata Consultancy Services was INR 1.18 trillion. Both these companies are part of the Tata Group. It is easy to see that this has significant implications for the capacity of the business group to de facto insure these companies. Specifically, in the context of our thought experiment, if India Hotels Company Limited runs into financial trouble, it may not be difficult for the rest of the

group companies, led by Tata Consultancy Services, to insure the former against bankruptcy and other extreme outcomes. By contrast, if Tata Consultancy Services is in financial distress, the rest of the Tata Group companies may find it difficult to provide the same degree of insurance, given the size of the company relative to other companies affiliated to the group. In other words, even where coinsurance exists in principle, de facto insurance cover is more likely for smaller companies within a business group than for larger companies. It is plausible, therefore, that risk-taking behaviour of firms affiliated to a business group would depend on their relative size within the business group. Specifically, lower insurance cover results in greater exposure to bankruptcy risk for larger companies within these groups, without affecting the aforementioned disincentive to take risks that are associated with higher return. On balance, it is likely that larger companies with a business group would take less risk compared to smaller firms within the same group.

Our second hypothesis, therefore, is as follows:

Hypothesis 2 (H2). *Relative to unaffiliated firms, risk taking by business group affiliated firms would vary with their relative size within their respective business groups, with risk taking declining monotonically with their relative size.*

One of the conclusions drawn by behavioural economists is that economic agents are more likely to take risk when they are in distress (Bowman, 1982; Kahneman & Tversky, 1979). An extension of this line of argument is that a firm is more likely to take risk when their performance is poor and, correspondingly, when their bankruptcy risk is high (Wiseman & Gomez-mejia, 1998). Under these circumstances only "bold" (i.e., risky) strategies that can lead to ruin but that are also associated with high levels of volatility of revenue, cash flows etc can ensure that the firm will escape bankruptcy in some states of the world. Available evidence is consistent with this argument. (Bromiley, 1991), for example, finds that "poor performance [of firms] appears to increase risk-taking" (p. 37). Similarly, Koudstaal & van Wijnbergen, (2013) find that "banks with a more troubled loans portfolio are likely to take on more risk" (p. 23).

This line of argument has an interesting implication for the difference in risk-taking behaviour of business group affiliated and unaffiliated firms.

The de facto likelihood of bankruptcy of business group affiliated firms is low, given the ability of business groups to bail out distressed member firms using the internal capital markets. Hence, if the purpose of increased risk-taking at times of distress is to ensure that bankruptcy can be avoided in some states of the world, this is more likely to be the case for unaffiliated firms than for affiliated firms. At the other end of the spectrum, when an unaffiliated firm is *safe*, i.e., quite a long away from being distressed, it is likely to take less risk. A business group affiliated firm that is safe may, not only take less risk per se, but also less risk relative to the unaffiliated firm. This is on account of the fact that a safe business group affiliated firm should be ready to step in and assist other firms affiliated to the business group, should they be in distress, unlike the unaffiliated firm.

Our third hypothesis, therefore, is as follows:

Hypothesis 3a (H3a). *Unaffiliated firms that are in distress will increase risk-taking but this may not be the case for distressed business group affiliated firms.*

Hypothesis 3b (H3b). *Both business group affiliated and unaffiliated firms will reduce risk-taking when they are financially "safe", but the risk reduction will be greater for business group affiliated firms*.

3.3 Research Design

In order to proceed with the analysis, we have to first have firm-year specific estimates of risk. Note that we are primarily concerned about the unsystematic or idiosyncratic risk that is associated with firms; we posit that this, as opposed to systematic risk, is a more appropriate measure of risk in the context of our discussion. We, therefore, use the much-used Sharpe's (1963) *single index model* to decompose total risk into unsystematic and systematic risk (Low, 2009). The relevant model is given by

$$r_{it} = \alpha_{it} + \beta(r_m) + \epsilon_{it} \qquad [1]$$

where r_{it} is the return of stock *i* in period *t;* α_{it} is the stock's alpha in period *t*; β is the beta of the stock; r_m is the market return and ϵ_{it} is the residual term. In this model, total risk (TTL RISK) is given by the variance of r_{it} ($\sigma_i{}^2$); systematic risk (SYS RISK) is given by the variance of $\beta(r_m)$, i.e., (σ^2 (β*r_m); and unsystematic risk (UNSYS RISK) is given by the variance of the residual (σ_{ϵ^2}) .

Next, we estimate the following baseline model to examine the difference in risk-taking by business group affiliated and unaffiliated firms, which is the basis for *H1*:

$$\text{RISK}_{i,t} = \alpha + \text{GROUP}_{i,t}\beta_1 + \text{Control Variables}_{i,t-1}\,\gamma + \text{v}_{i,t} \qquad [2]$$

Drawing on the relevant literature, we control for the following firm-specific characteristics: firm size (SIZE), firm age (AGE), sales growth of the firm (SALES_GRW), future growth opportunities (TOB-Q), and leverage (LEV). The respective literature for each firm-specific characteristics is explained in section 3.4.1. As we shall see later, the sample period also includes the financial crises periods of 2008 and 2009, and hence we control for the financial crisis, and distinguish between the impact of the crisis on risk-taking by business group affiliated and unaffiliated firms.

Equation [2] is estimated using a random-effects model. While it is well understood that random effects model estimates are consistent under certain conditions, in our case, the use of random effects estimators is necessitated by the fact that business group affiliation in the Indian context (GROUP) is time invariant, such that use of fixed effects models are not feasible. The use of lagged values for the control variables enables us to address the endogeneity problem. Hypothesis 1 suggests that β_1<0.

Next, we examine whether the risk-taking behaviour of business group affiliated firms vary with their relative size within a business group. As we shall see later, we can measure relative size in different ways, e.g., using assets, revenue, and cash flows. Specifically, we examine size distribution of firms within each business

group, and assign each affiliated firm to one of four quartiles. We then estimate the following model:

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta_1 + GROUP * SIZE\_WEIGHT\_Q2_{i,t}\beta_2 + GROUP * SIZE\_WEIGHT\_Q3_{i,t}\beta_3 + GROUP * SIZE\_WEIGHT\_Q4_{i,t}\beta_4 + Control\ Variables_{i,t-1}\gamma + v_{i,t} \quad [3]$$

where Q2, Q3 and Q4 refer to the second third and fourth quartiles of size distribution, and Q1 is the omitted category. The control variables for equation [3] are the same as those for equation [2], and equation [3] too is estimated using a random effects model. In keeping with H2, we expect $\beta_2 > \beta_3 > \beta_4$.

Finally, in order to examine H3a and H3b, we first compute the widely used Altman's (1968) z for each firm-year observation. The analysis in Altman's pioneering paper involved use of multivariate discriminant analysis (MDA) involving the following variables: working capital/total assets ratio, retained earnings/total assets ratio, earnings before interest and taxes/total assets ratio, market value of equity/book value of total debt ratio. Most of the models predicting bankruptcy risk involve data of firms in the U.S. However, these models may not be very accurate in predicting bankruptcy risk in emerging markets without incorporating the peculiarities of emerging market environment. Hence, in the 1990s Altman developed a new score using data from Mexico to incorporate the local factors that affect a firm's financial health. However, this model has two restrictions: 1) it requires the firm to have publicly traded equity 2) it is primarily for manufacturing firms. Later in 2005, Altman modified the data to improve the restriction of earlier model. Therefore, this study utilizes z-score computed using the financial ratio variables proposed in Altman (2005) to predict bankruptcy risk in emerging market. Specifically, we compute Altman's z score for each firm year using the following equation:

$$Z = (6.56*wc\_ta) - (3.26*re\_ta) + (6.72*opprof\_ta) + (1.05bv\_tl) + (3.25) \quad [4]$$

where wc_ta is working capital/total assets, re_ta is retained earnings/total assets, opprof_ta is operating income/total assets, and bv_tl is book value/total liabilities. A firm is considered to be distressed if its z measure is less than 1.81, and it is considered

to be safe if it's z measure is greater than 2.99; a score between 1.81 and 2.99 lies within a grey zone.

Thereafter, we estimate the following model:

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta_1 + DISTRESS_{i,t-1}\beta_2 + GROUP * DISTRESS_{i,t-1}\beta_3 + SAFE_{i,t-1}\beta_4 + GROUP * SAFE_{i,t-1}\beta_5 + Control\ Variables_{i,t-1}\gamma + v_{i,t} \quad [5]$$

The control variables for equation [5] are the same as those for equations [2] and [3], and equation [5] too is estimated using a random effects model. In keeping with H3a and H3b, we expect $\beta_2 > 0$, $\beta_3 \leq 0$, $\beta_4 < 0$ and $\beta_5 < 0$.

For all our regression models, in order to account for the possibility that risk-taking by business group affiliated firms is correlated within groups, we use clustering using a group-level identifier. Each regression models also controls for unobserved industry- and time-effects using industry and time dummies.

3.4 Data

3.4.1 Data Description

This study utilises firm level data from one of the largest EMEs of the world, India, the 10th largest economy in the world by nominal GDP ($2.04 trillion) and 3rd largest in the world by purchasing power parity ($7.28 trillion). According to survey conducted by Enterprise Surveys Global methodology under the World Bank Group, around 85% of the total firms in India constitute of firms held by largest owners. Importantly, a significant proportion of these firms are affiliated with business groups. Hence, the Indian context gives us a mix of business group affiliated and unaffiliated firms that is crucial for our analysis.

Data used in this study were collected from Prowess database provided by the Central for Monitoring the Indian Economy (CMIE). The Prowess database contains information on financial performances of listed and unlisted Indian companies. The database is built from the audited Annual Reports of companies and information

submitted to the Ministry of Company Affairs. In the case of listed companies, the database also includes company filings with stock exchanges and prices of securities listed on the major stock exchanges. It also provides information about business group affiliation, including identity of the group with which the firm is affiliated. In addition, there is detailed information about the board of directors. Prowess is widely used on many published empirical studies on Indian corporate sector, for example (Bhaumik & Selarka, 2012; Gopalan et al., 2014; Kali & Sarkar, 2011). It has, specifically, been used for studies that involves comparison of business group affiliated and unaffiliated firms (Bhaumik et al., 2017).

In keeping with the vast majority of firm-level studies, our sample includes firms from India's manufacturing sector (Bhaumik & Selarka, 2012; Chacar & Vissa, 2005; J Sarkar & Sarkar, 2000). Specifically, we include in our sample manufacturing firms listed in the Bombay Stock Exchange Ltd. (BSE) and National Stock Exchange of India Ltd. (NSE) in this study. Of the total of 5,395 firms listed in BSE and NSE, manufacturing firms were retained using 2-digit National Industrial Classification (NIC) from 10 to 32, which gives us an initial sample of 2,434 firms. The sample is then narrowed down into two ownership type such that each firm in the sample is affiliated with business group or is an unaffiliated or stand-alone private firm. The two different groups are identifiable using 6-digit ownership codes as provided by Prowess. Firm affiliated with business groups are coded as 201010 and stand-alone firms are coded 201020.

Data for seven (7) financial years were included for this study, from 2008 to 2014. The sample period is set after taking into account the evolution of corporate governance regulations in India. As discussed in the introductory section, later in this dissertation, we shall examine the role of corporate governance in influencing risk-taking behaviour of firms. One of the most important developments in corporate governance in India is the enactment of Clause 49 of the Listing Agreement of Stock Exchange imposed by Securities and Exchange Board of India (SEBI) since year 2000. It has been much discussed in the literature (Chakrabarti, Megginson, & Yadav, 2008). Some of the key mandatory recommendations on the implementation of governance

with regards to transparency, risk management, audit reports and directorships were implemented by the reformation of Clause 49 in 2006. Any analysis involving corporate governance should, therefore, start from 2008, to ensure that we account for a two-year post reform period for implementation of corporate governance reforms. In order to ensure that the sample period is consistent across the chapters, we opt for 2008-2014 data for all chapters of this dissertation.

We designate 2008 and 2009 and crisis years, which has implications for our regression analysis. According to data available from the Federal Reserve Bank of St Louis, the Federal Home Loan Mortgage Corporation (Freddie Mac) announced in February 2007 that it would no longer purchase the most risky subprime mortgages and mortgage-related securities. In June 2007, Bear Stearns informed investors that it was suspending redemptions from its High Grade Structured Credit Strategies Enhanced Leverage Fund. In August 2007, the American Home Mortgage Investment Corporation filed for Chapter 11 bankruptcy protection. In the same month, the credit rating of Countrywide Financial Corporation was downgraded. By September 2007, the Bank of England was preparing to provide liquidity support to Northern Rock, and the FOMC had voted to reduce the federal funds rate. In other words, even though the Lehman crisis broke in September 2008, the financial crisis had de facto started in 2007, such that 2008 was in effect a crisis year. At the other end, the National Bureau of Economic Research declared that the Great Recession had ended in June 2009, such that 2010 and beyond could in effect be called post-crisis years.

The final sample consists of unbalanced panel of 1,554 firms with 9,920 firm-years observations across 22 industries and 2 ownership types between 2008 and 2014. Group firms accounts for 42% (4,153 firm-years) of the total observations and non-group firms account for the balance 58% percentage (5,767 firm-years) of the observations. The breakdown of the final sample selection is simplified as follows:

Total manufacturing firms	2,434 firms
(Less) State (23) and Foreign-Owned firms (146)	2,265 firms
(Less) Firms with less than 5 years obs. (363)	1,902 firms
(Less) Firms with incomplete accounting data (128)	1,774 firms
(Less) Unavailability of complete stock prices (220)	1,554 firms (9,920 obs.)

Appendix B highlights the basic information of the sample on the distributions of group and non-group firms across the industries. It is evident that most of the industries are well represented in both ownership types. A closer look at the two-digit NIC code reveals that business groups prevail in heavy industries such as manufacturing of motor vehicles, trailers and semi-trailers (NIC 29) and other transport equipment (NIC 30). Meanwhile, non-group firm prevail in industries such as textile (NIC 13), pharmaceuticals and medicinal (NIC 21) and rubber and plastic products (NIC 22). From the overall sample, 41.86% are group affiliated firms and 58.14% are non-group firms.

In Table 3.1, the measurement and definitions of variables used in the analysis of this chapter are presented.

Table 3.1: Definitions of Variables
This table describes the variables in this study and the definitions of the variables

Variables	Definitions
TTL RISK	Total risk is variance of daily stock price using 60 days price. The variance is then annualised to get yearly variance.
UNSYS RISK	Unsystematic risk is the residual of single-index market model (Sharpe, 1963) decomposed from total risk.
SYS RISK	Systematic risk is the product of the firms' beta times the market daily returns.
BG	Dummy variable: 1 if the firm is a business group member; 0 otherwise
SIZE	Natural log of one year lagged total assets - Ln(Total Assets t-1)
LEV	One year lagged debt-to-equity ratio - Debt t-1/Equity t-1
AGE	Years since firm incorporation t-1
SALES_GRW	(Sales t - Sales t-1)/Sales t-1)
TOB-Q	(Market Value / Book Value) t-1
CRISIS	Dummy variable: 1 if year is 2008 and 2009; 0 otherwise
POST-CRISIS	Dummy variable: 1 if year is 2010 - 2014; 0 otherwise
SIZE_WEIGHT	Total assets of Firm *it* / Total Assets of Group *t*
REV_WEIGHT	Total sales of Firm it / Total Sales of Group t
CF_WEIGHT	Total cash flow of Firm it / Total cash flow of Group t
DISTRESS	Dummy variable: 1 if the firm is in distress zone; 0 otherwise
GREY	Dummy variable: 1 if the firm is in in grey zone; 0 otherwise
SAFE	Dummy variable: 1 if the firm is in safe zone; 0 otherwise

3.4.2 Variable Measurement

3.4.3 Summary Statistics

Table 3.2 reports the yearly mean and median of group and non-group firms across the years and during the crisis and post-crisis separately. The mean and median of overall firm market risk as measured by total variance of stock returns indicates that non-group firms are about 1.3 times higher than the mean of group firm's total risk. The pattern of total risk for both types of firms are similar with the total risk declined immediately post-crisis and increase thereafter until 2014.

By decomposing the total risk to unsystematic and systematic risk, it is evident that unsystematic risk makes up considerable proportions of firm's total risk for both the ownership types. The overall average unsystematic risk for both group and non-group firms consist of 81% of mean total risk concluding that most of the firm-risk is

explained by unsystematic risk. It is noted that during the financial crisis, from 2008 to 2009, these percentage is lower for both types of firms as higher percentage of total risk are now systematic risk as expected.

Similar to total risk, on average, the mean of unsystematic risk of non-group firms (11.148) is 1.3 times higher that are higher than that of group firms (8.866). Unsystematic risk is firm level or industry level risk that can be reduced or diversified by firm strategy. This risk has more explanatory power in achieving the objective of this study rather than the systematic risk which is market-related risk and may not be diversified by firms.

On average the mean of systematic risk of group firms are higher throughout the sample period, while the median of group firms are almost 2 times higher than that of non-group firms. However, the percentage of systematic risk is very low that it may not be effective to explain the risk-taking behaviour of firms.

Table 3.2: Annual Mean & Median of Dependent Variables of Group and Non-Group Firms

This table reports annual mean and median of selected manufacturing firms listed in Bombay Stock Exchange (BSE Ltd.) and National Stock Exchange of India Ltd. (NSE Ltd.) owned by group and non-group firm. Total risk is the annualised variance of daily returns over the fiscal year. Unsystematic risk is the annualised residuals from the market model. Systematic risk is the annualised variance of the product of firm beta times the market daily returns.

	N		TTL RISK (σ_i^2)				UNSYS RISK (σ_ϵ^2)				SYS RISK ($\beta_i^2 Rm^2$)			
	Group	Non-Group	Group		Non-Group		Group		Non-Group		Group		Non-Group	
Year			Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
2008	582	766	15.627	15.184	17.513	17.578	11.746	10.879	13.644	13.417	2.288	2.024	1.649	1.312
2009	586	785	13.122	13.128	15.019	14.919	10.439	10.235	12.082	11.835	1.248	0.921	0.742	0.403
2010	600	830	8.640	8.014	11.756	11.422	7.007	6.230	9.759	9.435	0.717	0.644	0.557	0.451
2011	604	852	9.093	8.088	12.660	12.536	7.408	6.267	10.451	10.062	0.832	0.658	0.582	0.430
2012	601	865	8.501	7.538	11.968	11.725	7.236	6.165	9.904	9.714	0.385	0.218	0.261	0.152
2013	593	846	10.736	9.705	13.926	14.117	9.040	8.081	11.204	10.915	0.416	0.415	0.312	0.128
2014	587	827	11.158	10.943	14.029	14.225	9.330	8.880	11.308	11.286	0.565	0.421	0.329	0.188
CRISIS	**1,168**	1,551	**14.370**	**14.063**	16.251	16.191	**11.090**	**10.515**	12.853	12.574	**1.766**	**1.372**	1.190	0.707
POST-CRISIS	**2,985**	4,216	**9.615**	**8.666**	12.861	12.902	**7.995**	**7.117**	10.520	10.319	**0.576**	**0.412**	0.408	0.230
TOTAL	4,153	5,767	10.953	10.654	13.773	14.036	8.866	8.358	11.148	11.102	0.911	0.544	0.618	0.296

Equality of mean and median of the dependent variables are presented in Table 3.3. For the equality of means, Welch t-test is used to test if the population mean between these two groups are equal. In the same manner, Wilcoxon rank-sum or also known as Mann-Whitney test is used to examine if the sample from group and non-group are from populations with the same distribution. From the test it is established that group firm have significantly lower total risk and unsystematic risk and higher systematic as conformed by the value of mean and median in Table 3.3

Table 3.3: Annual Equality of Mean and Median of Independent Variables between Group and Non-Group Firms

This table reports the univariate analysis of annual equality of mean and median of the two ownership type. The difference-in-means t-tests assume unequal variance across groups. Wilcoxon rank-sum test is used to test for differences in the medians. *, ** and *** indicate that group firms risk is significantly higher than non-group firms at 10%, 5% and 1% significance level, respectively.

		TTL RISK		UNSYS RISK		SYS RISK	
Year	**N**	**Mean Test**	**Median Test**	**Mean Test**	**Median Test**	**Mean Test**	**Median Test**
2008	1347	-7.463***	-8.610***	-7.662***	-8.807***	7.486***	7.915***
2009	1372	-8.816***	-9.425***	-8.373***	-9.075***	8.512***	9.1144***
2010	1429	-12.934***	-12.730***	-12.941***	-12.767***	5.816***	7.048***
2011	1454	-12.826***	-12.266***	-12.147***	-12.020***	6.837***	7.546***
2012	1465	-13.038***	-12.359***	-11.438***	-11.347***	5.048***	5.497***
2013	1439	-10.199***	-10.188***	-7.822***	-8.405***	2.408***	4.817***
2014	1414	-11.229***	-11.295***	-8.750***	-9.059***	8.955***	9.964***
CRISIS	2719	-10.860***	-12.214***	-10.988***	-12.603***	10.445***	11.492***
POST-CRISIS	7201	-26.176***	-25.846***	-23.057***	-23.720***	12.522***	15.317***
TOTAL	9920	-25.914***	-26.050***	-24.188***	-25.073***	14.329***	18.400***

In Table 3.4, the equality of mean and median of the control variables are presented. These univariate analyses (mean and median tests) provide equal results to indicate that group affiliates are generally larger (SIZE), high in leverage (LEV), older (AGE) and have higher future growth opportunity (TOB_Q) than non-group firms. Even though, the difference in average sales growth (SALES_GRW) between group and non-group firms are not as significant as the rest of the variables, generally it is evident that sales growth of non-group firms is higher than that of group firms. The results are consistent with the characteristics of firms in the context of this study.

Table 3.4: Annual Equality of Mean and Median of Control Variables between Group and Non-Group Firms

This table reports the univariate analysis of annual equality of mean and median of all the independent variables. The difference-in-mean t-test assume unequal variance across groups. Wilcoxon rank-sum test is used to test for differences in the median. *, ** and *** indicate that group firms are either higher (+ sign) or lower (- sign) than non-group firms at 10%, 5% and 1% significance level respectively.

Year	N	SIZE		LEV		SALES_GRW		AGE		TOB_Q	
		Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test
2008	1347	19.180***	17.216***	2.555***	2.990***	-1.141	-0.427	9.816***	11.016***	3.363***	4.209***
2009	1372	18.818***	16.878***	2.923***	3.013***	-1.657**	-0.432	10.370***	11.414***	1.951**	4.080***
2010	1429	18.371***	16.593***	2.688**	2.356***	-1.812**	-0.491	10.639***	11.727***	3.443***	5.619***
2011	1454	18.237***	16.529***	1.950**	1.948**	-0.786	-0.785	10.981***	12.057***	3.808***	5.395***
2012	1465	18.750***	16.840***	1.270*	1.891*	1.111	1.798*	11.103***	12.242***	3.068***	4.222***
2013	1439	18.297***	16.402***	1.113	1.442	-0.464	-0.324	10.746***	11.892***	2.883***	4.506***
2014	1414	18.381***	16.468***	1.219	1.311	-2.318***	-2.792***	10.893***	11.880***	3.326***	4.365***
CRISIS	2719	26.863***	24.106***	3.876***	4.239***	-1.847**	0.593	14.282***	15.864***	3.823***	5.548***
POST-CRISIS	7201	41.076***	36.980***	3.623***	3.992***	-1.739**	-1.158	24.332***	26.759***	7.423***	10.453***
TOTAL	9920	48.830***	43.998***	4.958***	5.583***	-2.300***	-1.195	28.239***	31.131***	8.376***	11.835***

Table 3.5: Mean and Median of Dependent and Independent Variables of Group and Non-Group Firms during Crisis and Post-Crisis Period

This table reports the mean and median of dependent and control variables for both group and non-group firms during the financial crisis and post-crisis.

Variables	Total Sample						Crisis						Post-Crisis					
	Group			Non-Group			Group			Non-Group			Group			Non-Group		
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
Dependent Variables																		
TTL RISK	4153	10.953	10.654	5767	13.773	14.036	1168	14.370	14.063	1551	16.251	16.191	2985	9.615	8.667	4216	12.861	12.902
UNSYS RISK	4153	8.866	8.360	5767	11.148	11.102	1168	11.090	10.515	1551	12.853	12.574	2985	7.995	7.117	4216	10.520	10.319
Independent Variables																		
SIZE	4153	4.581	4.504	5767	2.967	2.956	1168	4.419	4.372	1551	2.819	2.806	2985	4.645	4.573	4216	3.021	3.019
LEV	4153	1.694	1.047	5767	1.484	0.897	1168	1.626	1.076	1551	1.352	0.896	2985	1.721	1.033	4216	1.533	0.898
SALES_GRW	4153	0.155	0.098	5767	0.173	0.103	1168	0.222	0.160	1551	0.251	0.159	2985	0.129	0.080	4216	0.144	0.085
AGE	4153	41.34	34.00	5767	30.74	27.00	1168	41.42	34.00	1551	31.36	27.00	2985	41.31	34.00	4216	30.51	27.00
TOB-Q	4153	1.612	0.990	5767	1.205	0.777	1168	1.640	1.092	1551	1.314	0.884	2985	1.602	0.942	4216	1.165	0.730

Table 3.5 presents the mean and median of both dependent and control variables for ownership type. The table also reports the statistics for crisis and non-crisis period. During the crisis period group firm had higher TTL_RISK (1.3 times) and UNSYS_RISK (1.2 times) than non-group firms in comparison to their respective firms' total sample mean. Meanwhile, during the post-crisis period, the mean of both group and non-group firms are now below the mean of total period sample for both TTL_RISK and UNSYS_RISK. However, in the post-crisis period, comparing the risk measurement against their own mean in total sample, non-group firms have higher percentage of TTL_RISK (12.861) and UNSYS_RISK (10.520).

As for the control variables, especially LEV, SALES_GRW and TOB-Q there are no obvious different in all the three sample categories. Summarizing Table 3.5, it is revealed that group and non-group firms are equally affected during the crisis period. However, post-crisis group firms UNSYS_RISK reduced significantly in comparison to non-group firms.

The computation of Pearson correlation coefficient as shown in Table 3.6, shows the strength of the correlation coefficients between the variables. It is expected to not have significant collinearity in the regressions by using this set of variables because of the low degree of correlation between independent variables which are between -0.201 and 0.197. This suggests the absence of multicollinearity in the regression model. The unsystematic risk is highly correlated to total risk as considerable proportions of total risk are made of unsystematic risk. However, this does not pose a problem as both the risk measures are dependent variable.

The tolerance values (1/VIF) and variance inflation factors (VIFs) is presented in the first four columns of Table 3.6. The first two columns report the 1/VIF and VIF for TTL_RISK and the following two columns report 1/VIF and VIF of UNSYS_RISK. Tolerance values are more than 0.90 which is higher than the recommended 0.1. While the VIF values are less than 1.1 indicating that VIF values are below the threshold of 10. The overall results indicate that multicollinearity does not pose a serious problem to the results as they are all within the recommended range.

Table 3.6: Pearson Correlation Coefficients Matrix

This table presents the Pearson correlation coefficients matrix of both dependent and control variables

	TTL RISK		UNSYS RISK								
	VIF	**1/VIF**	**VIF**	**1/VIF**	**TTL RISK**	**UNSYS RISK**	**SIZE**	**LEV**	**SALES-GRW**	**AGE**	**TOB_Q**
TTL RISK	**-**	**-**	1.40	0.72	1						
UNSYS RISK	1.43	0.70	-	-	0.938***	1					
SIZE	1.40	0.71	1.44	0.69	-0.511***	-0.489***	1				
LEV	1.05	0.95	1.05	0.95	0.095***	0.105***	0.122***	1			
SALES_GRW	1.02	0.98	1.02	0.98	0.008	-0.018	0.025*	-0.021*	1		
AGE	1.05	0.96	1.05	0.95	-0.160***	-0.157***	0.197***	0.012	-0.058***	1	
TOB_Q	1.06	0.94	1.06	0.94	-0.195***	-0.201***	0.165***	-0.005	0.106***	0.070***	1

3.5 Regression

In this section the findings from the empirical tests are reported. On each of the tabled results are reported for the firm level regressions. Standard errors are clustered by group in all the random-effects regressions. In section A, the results from equations (2) are discussed. In section B, discusses the effect of group relative size (eq. 3) on firm risk. Section C describes the results from the regressions of effect of financial distress on firm risk (eq. 5).

3.5.1 Results and Discussion

A. Group Affiliation and Firm Risk Results. (Hypothesis 1)

Table 3.7 presents the regressions of the eq. 2 using the full sample. Column (1) reports the OLS regressions on the effect of group affiliation on TTL_RISK taking into account the control variables that remain constant to control any determinants of firm risk-taking behaviour as per eq. 1. In column (2), random-effects regression of eq. 3 is presented to estimate the effect of group ownership on TTL_RISK. It is evident that the two different estimations provide similar coefficient to show group firms assume lesser risk than non-group firms. In column (3), eq. 4 is estimated to identify the effect of group affiliation on TTL_RISK during the financial crisis period. The same estimation is repeated for UNSYS_RISK and reported in column (4) – OLS, column (5) – random-effects model and column (6) – random-effects during financial crisis period. All the regressions were done by clustering group id (VCE/Cluster Group) to address the endogeneity problem as discussed in Section 3.3.3. The independent variables are one year lagged as mentioned in Section 3.4.2.

The findings of the base model of both OLS (column 1 and 4) and random-effect regression (column 2 and 5) provide similar findings. On average, both group and non-group large firms have negative significant coefficient to firm risk. This is supported by the argument that the owners of large firms have with higher stake in firms seek to avoid higher risk for the fear of losing their wealth (Anderson, Duru, & Reeb, 2012). However, the effect of group affiliation is not statistically significant on

UNSYS_RISK. As for TTL_RISK, affiliates' firm-risk is significant at 10% level. In summary, all the regression estimates derived from the different equations give negative relations between the group ownership and firm risk; suggesting that after controlling for endogeneity concerns, group firms undertake lower risk than group firms.

Table 3.7: Regression Results on the Relationship between Group Ownership and Firm Risk
This table reports the basic OLS and random-effects model regression on the relationship of group ownership on firm risk. The numbers in parentheses are standard errors. *, ** and *** indicate the significant level at 10%, 5% and 1% respectively.

Variable	TTL RISK			UNSYS RISK		
	(1)	(2)	(3)	(4)	(5)	(6)
BG	-0.2148*	-0.2309*	-0.5769***	-0.0912	-0.1227	-0.3114
	(0.1279)	(0.1315)	(0.1490)	(0.1667)	(0.2011)	(0.2095)
CRISIS			3.1646***			1.9424***
			(0.1357)			(0.1999)
*CRISIS * BG*			1.2500***			0.6819***
			(0.1630)			(0.1231)
SIZE	-1.4773***	-1.4564***	-1.4548***	-1.2304***	-1.1666***	-1.1665***
	(0.0334)	(0.0551)	(0.0554)	(0.0978)	(0.1263)	(0.1263)
LEV	0.3831***	0.3255***	0.3227***	0.3449***	0.2938***	0.2925***
	(0.0312)	(0.0312)	(0.0312)	(0.0310)	(0.0344)	(0.0344)
SALES_GRW	0.0643	-0.0137	-0.0052	-0.1255	-0.1868*	-0.1820
	(0.1068)	(0.0878)	(0.0880)	(0.1055)	(0.0930)	(0.0929)
AGE	-0.0167***	-0.0173***	-0.0171***	-0.0150***	-0.0159***	-0.0159***
	(0.0044)	(0.0045)	(0.0045)	(0.0034)	(0.0036)	(0.0036)
TOB_Q	-0.2512***	-0.1656***	-0.1637***	-0.2294***	-0.1548***	-0.1536***
	(0.0278)	(0.0331)	(0.0330)	(0.0257)	(0.0284)	(0.0285)
Intercept	23.0475***	23.2165***	19.6564***	18.8416***	18.8285***	16.6700***
	(0.3398)	(0.3688)	(0.2905)	(0.3151)	(0.3433)	(0.4011)
Observations	9920	9920	9920	9920	9920	9920
R-Squared	0.446	0.447	0.450	0.447	0.374	0.377
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
VCE/Cluster Group	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

Crisis Period and Firm Risk Results.

As seen in Table 3.8, when the crisis period dummy is included in to the regression as per column (3) and (4), it is evident that group affiliates are now taking even lesser TTL_RISK (-0.5769) compared non-group firm. There is not much movement on the UNSYS_RISK which is expected as the financial crisis will have more impact on SYS_RISK than on UNSYS_RISK. The crisis dummy (CRISIS) indicate the level of firm risk taken by all type of firms in the sample. The positive sign shows that TTL_RISK are very high at 3.165 and UNSYS_RISK is at 1.9424. The high TTL_RISK in comparison to UNSYS_RISK proves that all types of firms in this context are highly affected by the market-level risk. In the next row, to examine the effect of group affiliation in the crisis period, group dummy is integrated with the crisis dummy (CRISIS * BG). It is established that group firms take even higher risk than non-group firm during the financial crisis and once again it is evident that TTL_RISK (1.25) are higher than that of UNSYS_RISK (0.6819). Thus, hypothesis H2 is supported.

The effects of all the independent variables are similar across both the risk measurement and are mostly significant at 1% level with the exception of SALES_GRW. This is consistent with the summary statistics as shown in Table 3.4. The evidence shows that SIZE is negatively related to firm risk. Evidence from prior empirical studies shows that large firms (in term of assets) are more stable and are less prone to default (Harris & Raviv, 1991) hence are expected to take less risk than smaller firms. In this context where most firms have high ownership concentration, the survival of large firms is the main objective of the owners.

Firm leverage (LEV) has positive and significant correlation with firm risk as firm with higher leverage tends to lead to higher risk (Kwok & Reeb, 2000). While prior literature has time and again provided evidence that business group have higher leverage than stand-alone firms, very few direct evidence is given on the link between stand-alone firm, leverage and firm-risk. This is also evident in our sample. Typically, firms with higher leverage are deemed to have increased bankruptcy risk (Anderson

et al., 2012). The very nature of our risk measurement which is variance of stock price which is the interpretation of market perceptions on firm implies that higher leverage indicates higher risk.

It is important to note that SALES_GRW and TOB-Q have negative coefficients for both the ownership types in spite SALES_GRW is statistically insignificant. The negative correlations of SALES_GRW and TOB-Q to firm risk indicate and firms with growth opportunity exhibit lower risk. This finding suggests that both group and non-group firms are not taking higher risk even when they have historical growth and potential growth in the future. These firms could potentially increase growth level if they invest in R&D or innovative industries, however, our findings show otherwise. The plausible explanation for the findings possibly lies on prior literature suggests that family shareholding have strong incentives to monitor and that potentially influence the increase in efficiency of strategic decisions and in particular investment strategy and process (Anderson et al., 2012). This allows firm with high ownership concentration to commit fewer resources on investments and still achieve similar outcomes.

Meanwhile, AGE is also negatively related to firm risk. This suggests that older firms tend to take less risk. This finding is well documented in previous literature that suggest older firms tend to be closer to their optimal size and therefore have less growth opportunity (Bilsen & Konings, 1998) that can lead inertia and rigidness in innovating (Kumar, 2004). Overall all these factors may lead to lower risk-taking. These findings are continuing across all the regression performed here forth. Hence, the relationship between control variables and firm risk will not be discussed for the rest of the hypotheses.

B. Firm Characteristics and Firm Risk Results

Table 3.8 reports the results of regressions of equations Eq. 3 is estimated for the size weightage in column (1), the revenue weightage in column (2) and cash flow weightage in column (3). Column (4), (5) and (6) reports the relationship of the same variables' with UNSYS RISK.

Firm size as measured by total assets being one of the key determinants that influences the firm risk is included in this regression. Affiliates' size weightage towards overall group size is used to differentiate firm risk. The firms in the lower quartile (q1) are affiliates that contribute the lowest towards overall groups' assets. Firm-risk of the rest of the firms that are higher contributors (q2, q3 and q4) is then compared to that of affiliates in q1.

As reported in column (1) and (4) of Table 3.8, the outcome of the analyses, for both TTTL RISK and UNSYS RISK, discloses that group firms in the three quartiles (q2, q3 and q4) take lower risk than that affiliates that are in q1. Even though the findings are statistically insignificant, economically it can be stated that affiliates that are highest contributor (q4) take the lowest risk (-0.3251 & -0.5836) implying that smaller firms in their particular group take higher risk than the bigger firms within the same group.

In column (2) and (5), the coefficient of affiliates' revenue weight on overall groups' revenue is reported. The results, once again show that firms in the higher quartile are negatively related to firm risk as compared to firms in the lowest quartile (q1). The coefficients of both TTL RISK and UNSYS RISK are significant at 10% and 5% level respectively. The findings indicate that firm-risk keeps reducing as the quartile increases, suggesting that firms that contribute the most towards overall groups' revenue tend to take lower risk.

Next, the overall weight of affiliates' cash flow as reported in column (3) and (6). The value is negatively related to firm risk for all three quartiles. Affiliates in the highest quartile (q4) are highly significant (1% level) for both TTL RISK and UNSYS RISK as compared to the other 2 quartiles.

The outcome reported in Table 3.8 repeatedly attest that affiliates that are the highest contributors towards groups value tend to take lower risk. While all the variables tested - total assets, sales revenue and operating cash flow equally towards an affiliates' assets/income that could be reallocated to other affiliates experiencing distress, it is evident that size (total assets) and (sales) revenue are not as liquid as cash flow. Hence, the affiliates that are considered the cash cows of the groups may be more risk averse compared to the rest of the affiliates. This evidence further proves that affiliates risk-taking appetite hugely depends on their ability to provide co-insurance immediately to other affiliates in the case of financial distress.

Table 3.8: Regression Results on the Relationship between Firm Characteristics and Firm Risk
This table reports the basic OLS and random-effects model regression on the relationship of size, revenue and cash flow weightage on firm risk. The numbers in parentheses are standard errors. *, ** and *** indicate the significant level at 10%, 5% and 1% respectively.

Variable	TTL RISK			UNSYS RISK		
	(1)	(2)	(3)	(4)	(5)	(6)
BG	-0.4467	-0.1131	-0.3713	-0.0110	0.2256	-0.0352
	(0.2455)	(0.2682)	(0.1725)	(0.2164)	(0.2303)	(0.1926)
CRISIS	3.1754***	3.1757***	3.1823***	1.9585***	1.9552***	1.9661***
	(0.1316)	(0.1309)	(0.1276)	(0.1956)	(0.1953)	(0.1895)
*BG * CRISIS*	1.2102***	1.2140***	1.2157***	0.6356***	0.6429***	0.6360***
	(0.1667)	(0.1681)	(0.1669)	(0.1252)	(0.1273)	(0.1262)
*BG * SIZE_WEIGHT_Q2*	-0.1454			-0.2886		
	(0.2752)			(0.2409)		
*BG * SIZE_WEIGHT_Q3*	0.0463			-0.2396		
	(0.2802)			(0.2816)		
*BG * SIZE_WEIGHT_Q4*	-0.3251			-0.5836		
	(0.2977)			(0.3120)		
*BG * REV_WEIGHT_Q2*		-0.5006			-0.5631*	
		(0.2882)			(0.2472)	
*BG * REV_WEIGHT_Q3*		-0.5829*			-0.7056*	
		(0.2938)			(0.2767)	
*BG * REV_WEIGHT_Q4*		-0.7545*			-0.8687**	
		(0.3136)			(0.3062)	
*BG * CF_WEIGHT_Q2*			-0.0533			-0.0185
			(0.1561)			(0.1487)
*BG * CF_WEIGHT_Q3*			-0.1132			-0.1877
			(0.1588)			(0.1443)
*BG * CF_WEIGHT_Q4*			-0.5646***			-0.7742***
			(0.1596)			(0.1545)
SIZE	-1.4451***	-1.4280***	-1.4399***	-1.1468***	-1.1353***	-1.1456***
	(0.0526)	(0.0450)	(0.0491)	(0.1222)	(0.1149)	(0.1175)
LEV	0.3222***	0.3193***	0.3184***	0.2913***	0.2886***	0.2865***
	(0.0313)	(0.0306)	(0.0299)	(0.0347)	(0.0339)	(0.0326)
SALES	-0.0077	0.0101	0.0127	-0.1839*	-0.1645	-0.1573
	(0.0884)	(0.0844)	(0.0854)	(0.0933)	(0.0869)	(0.0839)
AGE	-0.0173***	-0.1622***	-0.1605***	-0.0157***	-0.0153***	-0.0157***
	(0.0044)	(0.0046)	(0.0045)	(0.0035)	(0.0035)	(0.0035)
TOB_Q	-0.1630***	-0.1622***	-0.1605***	-0.1532***	-0.1524***	-0.1495***
	(0.0332)	(0.0335)	(0.0342)	(0.0286)	(0.0288)	(0.0299)
Intercept	19.7683***	19.9981***	19.8053***	16.9049***	17.0629***	16.8700***
	(0.3113)	(0.3106)	(0.2849)	(0.3484)	(0.3414)	(0.3691)
Observations	*9920*	*9920*	*9920*	*9920*	*9920*	*9920*
R-Squared	*0.42*	*0.42*	*0.42*	*0.315*	*0.315*	*0.316*
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
VCE/Cluster Group	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

C. Bankruptcy Risk and Firm Risk

In Table 3.9, annual mean and median value of bankruptcy risk is presented to show the bankruptcy risk for both group and non-group firms across the years in the 3 different bankruptcy risk zones. Using the well-known Z-Score distress prediction model by Altman (2005), the Z-score were computed using coefficients and variables proposed for emerging markets and subsequently comparing the risk-taking behaviour of the firms.

The comparison involves classifying the firms into three zones, namely distress, grey and safe, on the basis of the cut-off points for each zone given by Altman (2005). The cut-off points for each zone are given in Table 3.9. The results show that more of group firms are in the distress and grey zones compared to non-group firms. Only 8.4% of non-group firms are in the distress zone versus 10% of group firms. Whereas, for grey area where firms are quite close to the distress zones, there are 7.4% non-group firms compared to 12% of group firms. 84% of non-group firms and 78% of group firms are in the safe zone.

However, on the closer look on the firms classified as distress, it is noted that mean of Z-score of non-group firms are far worse than group firms with an overall average of -1.606 compared group firms' -0.928. This demonstrates that while there are fewer number of non-group firms in the distress zone, these firms are deeper into financial distress compared group firms. Meanwhile, the value for both group and non-group firms in the grey zone are almost similar (2.595 and 2.534). In the safe zone, non-group firms have higher Z-score (5.060) than group firms (4.539).

Table 3.9: Bankruptcy Risk Score Comparison by Group and Non-Group Firms

This table presents the annual comparison of group and non-group firms in three zones of bankruptcy risk using the coefficient and variables proposed by Altman (2005) for emerging markets. The bankruptcy zones are Z < 1.81 "Distress", 1.81 < Z < 2.99 "Grey" and Z > 2.99 "Safe zone.

	N		Distress				N		Grey				N		Safe			
	Group		Group		Non-Group				Group		Non-Group				Group		Non-Group	
Year	Group	Non-Group	Mean	Median	Mean	Median	Group	Non-Group	Mean	Median	Mean	Median	Group	Non-Group	Mean	Median	Mean	Median
2008	46	43	-0.923	0.060	-2.099	-0.602	56	35	2.582	2.619	2.495	2.455	480	687	4.826	4.646	5.158	4.961
2009	60	63	-0.846	-0.633	-1.430	-0.394	69	61	2.504	2.545	2.545	2.670	457	662	4.787	4.597	5.096	4.822
2010	44	43	-0.912	0.148	-2.557	-0.574	53	48	2.538	2.530	2.566	2.608	503	738	4.832	4.618	5.165	4.952
2011	53	62	-0.976	0.102	-1.506	-0.229	65	57	2.564	2.663	2.523	2.556	486	731	4.804	4.595	5.055	4.753
2012	70	86	-0.910	0.164	-1.126	0.059	86	77	2.567	2.649	2.434	2.461	445	701	4.760	4.497	5.017	4.677
2013	73	88	-0.779	0.213	-1.540	-0.333	90	80	2.506	2.569	2.480	2.496	430	678	4.690	4.392	4.933	4.648
2014	81	97	-1.120	-0.178	-1.629	-0.313	84	69	2.497	2.460	2.500	2.501	422	661	4.684	4.368	4.983	4.702
CRISIS	106	106	-0.880	0.286	-1.701	0.036	125	96	2.539	2.595	2.527	2.625	937	1349	4.807	4.614	5.127	4.906
POST-CRISIS	321	376	-0.945	-3.532	-1.579	-0.212	378	331	2.532	2.595	2.493	2.518	2286	3509	4.758	4.506	5.033	4.760
TOTAL	427	482	-0.928	-3.805	-1.606	-0.205	503	427	2.534	2.595	2.501	2.529	3223	4858	4.772	4.539	5.060	4.806

In the final regression results presented in Table 3.10, the firm that have been classified as *Distress*, *Grey* and *Safe* are included in the regression to analyse the risk-taking behaviour of group firms related to non-group firms. The firms that are in the distress and safe zones are compared against firms in the grey zone to differentiate their risk-taking behaviour. Hence, the omitted category is "GREY" and the coefficient reported are those of firms in *Distress* and *Safe* zones related to *Grey* zone.

The estimation shows that the group affiliates risk-taking is not significant when the bankruptcy dummies are included. However, in the crisis period the high positive coefficient of both types of risk measures show that high firm risk during the financial turmoil did not change even though the firms may be in distress. Firms that are in the *Distress* zone have higher risk (0.3071 and 0.2405) than the firm the firms in the *Grey* zone. This value is also statistically very significant. While group affiliates take even higher risk than non-group firms (0.3071 + 0.2140) even though this finding is not statistically significant.

Meantime, all firms in the *Safe* zone take very little risk (-0.5411 and -0.3167) related to firms in the *Grey* zone. Group affiliated firms in the *Safe* zone are very risk averse compared to the affiliates in the *Grey* zone. This value is statistically very significant. This finding validates our argument that group firms that are in the *Safe* zone and will not face any financial distress in the coming years do not tend to take more risk to avoid being unable to provide co-insurance towards the group. Whilst, group firms that are in the *Distress* zone take even higher risk compared to the rest of the categories and non-group firms as they cannot get into more trouble by taking risk as they are already facing the possibilities of going bankrupt soon. By taking the additional risk, firms in the *Distress* zone are taking the gamble of making higher profit or in the worse scenario of further loss they can be assisted by the co-insurance effect of business groups.

Table 3.10: Regressions Results on the Relationship between Financial Distress and Firm Risk
This table reports the basic OLS and random-effects model regression on the relationship of size, revenue and cash flow weightage on firm risk. The numbers in parentheses are standard errors. *, ** and *** indicate the significant level at 10%, 5% and 1% respectively.

Variables	TTL RISK	UNSYS RISK
	(1)	(2)
BG	-0.2504	0.2316
	(0.2526)	(0.2669)
CRISIS	3.2526***	2.2110***
	(0.0143)	(0.0184)
*BG * CRISIS*	1.2967***	0.7297***
	(0.1639)	(0.1229)
DISTRESS	0.3071***	0.2405***
	(0.0258)	(0.0598)
*BG * DISTRESS*	0.2140	0.1081
	(0.2994)	(0.2777)
SAFE	-0.5411***	-0.3167***
	(0.0236)	(0.0190)
*BG * SAFE*	-0.6549**	-0.8901***
	(0.2458)	(0.2229)
SIZE	-1.3961***	-1.1123***
	(0.0468)	(0.1131)
LEV	0.2775***	0.2532***
	(0.0223)	(0.0236)
SALES_GWR	-0.1061	-0.2924*
	(0.1045)	(0.0926)
AGE	-0.0177***	-0.0163***
	(0.0046)	(0.0035)
TOB_Q	-0.1320***	-0.1324***
	(0.0369)	(0.0288)
Intercept	18.6582***	15.8263***
	(0.2423)	(0.2964)
Observations	*9920*	*9920*
R-Adj	*0.416*	*0.354*
Year FE	*Yes*	*Yes*
Industry FE	*Yes*	*Yes*
VCE/Cluster Group	*Yes*	*Yes*

3.5.2 Conclusion

The overall objective of this study is to understand the effect of group affiliation on firm risk in the emerging market using the data from Indian manufacturing firms. Group affiliates are characterized as having more dispersed ownership and diversified operations suggest the probability that they have the comparative advantage for affiliates to undertake higher risk in comparison to non-group firms. However, it is shown that despite having similar ownership concentration, hence the likelihood to suffer from similar type of agency problems, both group and non-group have distinguishable firm risk-taking behaviour.

First, the results also show that high proportion of firm total risk consists of unsystematic risk. High unsystematic risk suggests that firms are able to manage this type of risk using strategies derived within the firms. Second, even though systematic risk only accounts for less than 10 percentage of overall risk, group affiliates exhibit a higher level of systematic risk related to non-group firms. The findings of this study show that on average group firms are more risk averse than non-group firms.

Business groups consist of widely diversified firms and any individual affiliate may benefit from the diversification effects at group level. The assumption that group-affiliated firms may reallocate resources to assist other financially distressed firms can be further supported by observing the unsystematic risk of both group and non-group firms. This is the justification for performing all the regressions on the total risk and unsystematic risk only.

It is predicted that business group affiliated firms will be able to manage risk using co-insurance effect, hence, managing the group affiliated firm as a portfolio rather than as a single entity proves the existence of risk sharing among group firms consistent with the findings documented by Nakatani (1984) and Nivoix & Nguyen (2009). Fortuitously, groups have higher incentives to monitor group firm risk-taking behaviour and consequently allocating assistance to the affiliates that are in difficulties.

Whilst it has been demonstrated that co-insurance effect which is exclusive to business groups facilitates risk sharing across the group, it is further argued that not every affiliate will be able to assume equal amount of risk across the board. This could be implicated directly to the characteristics of affiliates that form the business groups. Some affiliates might be 'too big to fail' while others may be the 'cash cow' of the whole group that cannot fail at any costs thus not able to take high risk.

To examine this, group affiliates are categorised in quartiles according to the weightage of their contribution towards groups' overall size, revenue and cash flow and analyse their risk-taking behaviour. The results show that group affiliates risk-taking behaviour is negatively related to their contribution size. The affiliates that are in the highest quartile take much lower risk than those affiliates in the lower quartile for all three sizes relative to further prove the argument that risk-taking behaviour of group firms are co-related to their ability to provide co-insurance to other affiliates.

Given that group affiliates exhibit lower level of unsystematic risk and obliged to provide co-insurance for other affiliates in the network, one can expect them to be conservative in taking higher risk when the firms are facing the risk of bankruptcy. However, the findings show the opposite occurs in this context, with both types of firm exhibit equal risk-taking behaviour when they are in the distress and safe zones. The firms in the distressed zone take higher risk relative to the firms that are in grey area, whilst firms in the safe zone assumes significantly lower risk compared to the firms in the grey area with group affiliates even lesser risk. The results highlight the power of prospect theory in explaining how firms are sensitive to loss relative to gain as well as the inability of group firms to provide de-facto coverage for affiliates that are 'too big to fail' firms.

Besides the main findings, group and non-group firms in India show lower firm risk when the firms are bigger (measured by total assets), older (age) and in the presents of growth opportunities (represented by Tobin's q). Whereas, historical growth (represented by sales growth) do not have much effect on firm risk.

It is concluded with the argument that group affiliated firm's lower risk-taking is attributed to the effect of co-insurance on group affiliated firm. It can be argued that co-insurance of group firms not only allow resource reallocation but also to ensure survival of group affiliates in the long run.

CHAPTER FOUR :
CORPORATE GOVERNANCE AND FIRM RISK

ABSTRACT

Extending the previous research on the effectiveness of corporate governance on firm performance, value and risk in developed countries have been ample but very little evidence of the same effect on firms from developing countries with different ownership structure. Hence, in this study, we aim to examine the role of corporate governance mechanisms in defining firm risk in business group affiliated firms relative to non-group firms in developing economy. Using a sample of firms from India, one of the largest emerging economy, we show that having similar ownership concentration and family control that causes type II agency problems, business group affiliated firms and non-group firm risk are affected similarly by all the different corporate governance attributes. We further check on the robustness of this study by analysing how group-affiliated firms' asset, sales and cash flow contribution towards its overall group affect firm risk. We deepen the robustness check by examining the risk-taking behaviour of group- affiliated firms facing low and high bankruptcy risk. Overall, we find that corporate governance mechanism, which is a wide range of board characteristics in this case, is a effective tool to monitor and control controlling shareholders in firms with high ownership concentration.

Keywords: emerging economies, risk-taking, group-affiliated, corporate governance

4.1 Introduction

In the previous chapter, it is established that group affiliated and stand-alone private firms have dissimilar firm-risk, even though it can be suggested that high ownership concentration in both group and non-group firms will coerce them to have similar risk appetite. While both types of firms have comparable agency problems and incentives in the form of private benefit of control to undertake similar firm risk, it is shown that group affiliated firms take lesser risk that non-group firms. It has been emphasized that the main factor that inhibits group affiliated firm risk-taking behaviour is the co-insurance effect that is exclusively available to affiliated firms. The moral hazard - a result of the co-insurance effect, is also argued to be contributing to the risk-taking behaviour of affiliated firms.

In this chapter, we extend the discussion in the previous chapter by examining how corporate governance in emerging market contexts may influence risk-taking by firms, and how corporate governance may work differently for business group affiliated and unaffiliated firms. The motivation for this chapter is the observation that emerging market economies have adopted corporate governance regulations and practices from the developed country contexts. For example, corporate governance codes in both China and India have emphasised the role of independent directors. In China, independent directors are meant to be independent of controlling shareholders and all committees except the corporate strategy committee are meant to be chaired by and largely composed of these directors (Jiang & Kim, 2015). Similarly, in India, half of the board of a listed company is expected to be comprised of independent directors (Chakrabarti et al., 2008). However, it is unclear as to whether these corporate governance practices (or regulations) can have a significant impact on firm behaviour in a context where ownership is concentrated and hence incumbent owner-managers cannot be removed or disciplined either by way of internal mechanisms such as shareholders' meetings, nor by way of markets. Further, corporate governance codes in these countries often want to ensure that minority shareholders are not expropriated by the majority-controlling shareholders, and therefore emphases issues such as

minority shareholders' rights and disclosure of related party transactions (Rajagopalan & Zhang, 2008).

There is an emerging literature that focuses on the impact of corporate governance on firms with concentrated ownership which are more prominent in developing economies. However, this area of study is still very new (Black & Khanna, 2007; Black, Kim, Jang, & Park, 2015; John et al., 2008; Yoo & Sung, 2014) and mainly focused on the effect of corporate governance on firm value, other measures of performance, R & D investment and issues such as related party transactions and earnings management. The impact of corporate governance on risk-taking by firms in these contexts, however, remains unexplored and yet it is important to better understand both the impact of corporate governance on emerging market firms with concentrated ownership, and also the difference in the impact of corporate governance on risk-taking by business group affiliated and unaffiliated firms. The rationale for this has been discussed in an earlier chapter.

Risk-taking is one of the critical determinants of corporate success. While it is true that excessive risk is pointed out as one of the contributors to financial crises (Fahlenbrach & Stulz, 2011; Rose-ackerman, 1991), it is also safe to infer that firms may not thrive if certain degrees of risk is not undertaken. Firm risk is a key policy to improve efficiencies in the utilisation of assets and the resulting profitable opportunities, returns, firm growth and innovativeness (Boubakri, Cosset, & Saffar, 2013; Bromiley, 1991; Jensen & Meckling, 1976; John et al., 2008). If owner-managers of firms with concentrated ownership are less willing to take risk – see Bhaumik & Dimova (2014) for a discussion about risk-taking by family firms – this may have a detrimental effect on the future wealth of the minority shareholders who may not share the risk attitude of the majority-controlling shareholders. As we have already seen, business group affiliated firms may actually take even less risk than unaffiliated firms, further aggravating the problem. Even though risk sharing is an important function of business groups, both group and non-group firms have similar ownership structure, that is, highly concentrated with ownership of shares in the hands of family owners or groups (Khanna & Rivkin, 2001). Both types of firms are managed

by managers who are entrenched. Entrenched managers manage firms may undertake less risky investments to reduce exposure of company and themselves (John et al., 2008). This raises the question as to whether, in emerging market contexts, the role of corporate governance may be used to constraint corporate decision makers' to induce firms to take more risks for both group and non-group firms.

The main contribution of this chapter, therefore, is to the literature which examines the efficacy of corporate governance codes and mechanisms that are based on developed country contexts with dispersed ownership and principal-agent problem in emerging market ownership where owner-managers are entrenched. Prior research in Anglo-Saxon contexts with diluted ownership suggests that agency problems between the contracting parties and the economic players of the firms determine their risk-taking incentives (Panageas & Westerfield, 2009). There is a limited literature on the impact of corporate governance on firm risk-taking behaviour in both Anglo-Saxon and developing country contexts (John et al., 2008), but many of the studies outside the Anglo-Saxon contexts are focused on Japanese firms (Huang & Wang, 2015; Nakano & Nguyen, 2012; Nguyen, 2011). We extend that literature by focusing on the Indian context which also gives us the ability to explore how corporate governance may differently impact risk-taking for business group affiliated and unaffiliated firms.

We find strong and robust evidence that corporate governance plays a strong role in monitoring and controlling the controlling shareholders who also hold the managerial position in firms with high ownership concentration. Successful monitoring and controlling of the managers subsequently shape firm strategies in particular firm risk.

4.2 Hypotheses Development

In this section, we first explore the literature to draw some conclusions about the influence of corporate governance on risk-taking by firms. For our purposes, we adopt the stylised way to capture corporate governance of firms, namely, by way of their board characteristics (Su & Lee, 2013). This is consistent with the experiences of firms in Anglo-Saxon contexts where a company's Board of Directors exists to protect the interests of the shareholders who cannot observe the actions of the managers, and who are also widely dispersed and therefore do not have the incentive to directly monitor these managers. Indeed, besides defining the firm's business concept, developing firms mission and implementing the strategy to achieve the firm's strategy, one other crucial role of board members is to appoint and reward executives for their performance but at the same time monitor the inclination of executives in pursuing their self-interest over the shareholders' interests (Pearce & Zahra, 1992).

The composition of board is critical to ensure that the board members fully utilise their business expertise to formulate and set the company's structure, strategic goals and financial policies, provide advice towards putting the goals and policies to effect, overseeing the implementation and supervise the management of the firm and report to all shareholders including the non-controlling ones. Therefore, board composition is an important consideration in explaining the ability of internal monitoring in the form of corporate governance. There are numerous studies that demonstrate that not only do Board characteristics such as independence – which is an important concern of regulators – matter (Garg, 2007), but so also does factors such as the gender composition of the Board (Buse, Bernstein, & Bilimoria, 2016; Liu, Wei, & Xie, 2013).

The literature suggests that Board characteristics can influence risk-taking by firms; we discuss this literature in greater detail below. A priori, there is nothing to suggest that the influence of corporate governance on risk-taking would be qualitatively different for business group affiliated and unaffiliated firms. In emerging market contexts, and certainly in the Indian context, both types of firms have concentrated

ownership and entrenched owner-managers. However, given that business group affiliated firms take less risk than unaffiliated firms, ceteris paribus, the quantitative impact of corporate governance on these two types of firms may differ.

4.2.1 Board Size and Firm Risk

Literature in psychology and organizational behaviour on group decision-making suggests that the final decision made by a group is a result of compromise between each individual in the group as group members try to minimise conflicts and reach consensus. Kogan & Wallach (1966) argue that an individual does not deviate much from his/her own judgments when making decisions privately but clings closer to central tendency when making decisions as a group. Since the pressure for conformity increases with size of the group, it is less likely that extreme choice is likely to be taken in a large size group. Kogan & Wallach, (1964); Sah & Stiglitz, (1991) studies further support the aforementioned claim by observing the risk level of projects rejected and approved by the final decisions of decision-making groups. The approval of sufficient members to approve projects shows that the likelihood of accepting risky projects is as much as accepting less risky projects. However, large groups end up selecting average projects in anticipation of stable performance. Applying this to corporate boards' decision-making, Cheng (2008) provides evidence that firms with larger board size have less volatile accounting and market-based performance. Firms with larger boards also appear to select less risky investments and associated with lower return volatility. Nakano & Nguyen (2012) extending similar study to Cheng (2008) in Japanese *kiretsu* type of firms, find that larger boards are associated with lower risk-taking by demonstrating the lower performance volatility as well as lower bankruptcy risk. Huang & Wang (2015) using Chinese firms sample find systematic relationship between board size and firm risk-taking. The firms with smaller board size are more likely to pursue riskier investment policies. As such, much of the literature on corporate governance postulate the negative relationship between board size and risk-taking. While CEOs do not necessarily have to agree with the mean/median Board opinion when they are part of the majority-controlling

shareholder group – an argument that can be translated to other contexts with powerful CEOs (Pathan, 2009), on the basis of the existing evidence we hypothesise the following:

Hypothesis1 (H1)*: Boards' size is negatively associated with firms' risk.*

4.2.2 Board Independence and Firm Risk

The concept of board independence originated in the United States in response to some of major corporate and accounting scandals such as Enron and Worldcom. By having independent directors that have no material relationships with the company, independent directors with no vested interests in the business practices are expected to monitor the firms with impartiality (Ringe, 2013). In India the minority shareholders rights are protected under the Companies Act 2013 by being able to nominate a director on the board of the company. The mandatory appointment of independent directors in listed companies is made with the objective to ensure a balance of interests between promoters and other shareholders. Section 149 of the Companies Act 2013 sets out the composition of a board for a listed company. It must include executive as well as non-executive directors. The non-executive directors should comprise at least half of the directors on the board. If the chairman of the board is a non-executive director, then at least one third of the directors on the board must be independent directors. Where the company does not have a non-executive chairman, then at least half the directors on the board must comprise independent directors, and where the non-executive chairman is a promoter of the company or is related to any promoter or person at board level, at least half of the directors on the board must comprise independent directors.[6]

Board independence has been an important component of the corporate governance code in much of the developed world, and can be traced back to the recommendations of, among others, the Cadbury Committee. Correspondingly, much of the recent

[6] Ministry of Corporate Affairs, Government of India

academic research on corporate governance examines board governance and its implications for firm performance and managerial decisions such as dividend payments (Zattoni & Cuomo, 2010). There is also considerable scepticism about the ability of independent directors to effectively monitor and discipline managers even within the institutional contexts of the developed economies. For example, it has been argued that companies tend to appoint independent directors who are over-optimistic and overly sympathetic to the company management, and yet who may not be good performers (Cohen, Frazzini, & Malloy, 2012). Indeed, it has been argued that management-friendly boards can be optimal for companies (Adams & Ferreira, 2007).

The challenge of meeting corporate governance objectives by way of independent directors becomes even more challenging in the context of EMEs, where the corporate landscape is dominated by firms with concentrated ownership (OECD, 2012), many of them owned or controlled by families. Anderson & Reeb (2004) find that dominant-controlling shareholders in, for example, family firms seek to minimise the presence of independent directors while minority shareholders seek to have independent directors' representation. This finding highlights the importance of independent directors in protecting and representing the interests of minority shareholders. This is mainly because independent directors on board firms with high ownership concentration such as family or business group-controlled firms are expected to monitor the owner-manager's activities, such as tunnelling, diversification and bailing out weak affiliates, that can be detrimental to the minority shareholders' wealth and subsequently reduced the private benefits of control of owner-manager (Holmén et al., 2016). However, it is unclear as to whether independent directors are able to address corporate governance problems in EMEs. Clarke (2006), for example, argues "proponents of the institution of independent directors misconceive the nature of the corporate governance problem in China …. and have not taken into account specific features of the Chinese institutional environment – particularly the legal environment – that affect the viability of any proposed solution" (pp. 126). This is consistent with the findings (Peng, 2004), namely, that while outside directors are associated with improvement in firm performance when performance is measured by sales growth,

there is little impact of outside directors on firm profitability which may matter more to the shareholders. This argument is generalisable to other EMEs contexts where the cost of attempting to discipline errant managers by way of litigation can be significantly high, and where entrenchment of manager-owners in firms with concentrated ownership makes it difficult to discipline them under any circumstances. Further, within certain EMEs cultural contexts, independent board members may defer to the top management as part of a social exchange (Ma & Khanna, 2016). The problem is further exacerbated by paucity of qualified independent directors. For example, Balasubramanian, Black, & Khanna (2010) do not find any relationship between board independence and firm performance in India.

There is evidence to suggest that, scepticism notwithstanding, independent board members can have some impact on managerial decisions. For example, (Peasnell, Pope, & Young, 2005) find that outside directors can influence the extent of earnings management in companies. Similarly, evidence suggests that board independence may be positively associated with dividend payments (Sharma, 2011). In the specific context of firms' risk-taking, evidence suggests that independent directors can influence management decisions, for example, by reducing excessive risk-taking by firms (Jiraporn & Lee, 2008). More generally, a positive association between board independence and firm performance has been found in the context of EMEs (e.g., Liu, Miletkov, Wei, & Yang, 2015). Related research suggests that paucity of qualified independent directors and their consequent "busyness" may not pose a problem in the context of EMEs (Sarkar & Sarkar, 2009). Hence, it is perhaps possible to postulate that independent directors will be able to defend interests of shareholders – minority shareholders in the case of EMEs. Since firms with concentrated ownership and/or family control are expected to take less risk than is optimal for long run growth, this, in turn, may imply that in the context of these firms board independence may have to be associated with greater risk-taking.

Hypothesis 2 (H2) *: Independent directors are positively related to firm risk.*

However, independent directors in group affiliated firms may have different motivation and incentives when it comes to shaping firm risk of individual group affiliated firms. Individual group affiliated firms typically have sufficient power to pursue their firm strategies but these strategies may affect other firms in the group as they are interdependent for internal capital and risk-sharing. Even though Clause 49 requires independent directors to be unrelated to any of the board members, given the lack of supply of outside directors with directorship expertise and professional qualification, most of independent directors may seat in multiple boards within the same group. Hence, instead of monitoring and advising individual group affiliated firms using only information from that individual firm, independent directors may take into consideration the overall group position in performing their duty.

Moral hazard in group affiliated firms due to the presence of co-insurance is a factor that can also influence independent directors to discourage risk-taking by group affiliated firm. Even though individual group affiliated firms within the group enjoy the benefit of having shielded from bankruptcy risk in the eventual of failed risky business ventures, this co-insurance effect may not be de-facto to all the firms within the group. For example, failure of main provider to group income and cash flow may contribute to the failure of the total group. Keeping this in mind, independent directors may discourage risk-taking in group affiliated firms.

Therefore, it can be hypothesised that independent directors discourage risk-taking.

Hypothesis 2a (H2a)*: Independent directors are negatively related to group affiliated firms' risk.*

4.2.3 Female Directors and Firm Risk

Extensive studies in the psychology and other fields show the behavioural differences in gender. These studies investigate women's risk-averse nature when allocating pension funds, insurance, investment and purchasing common stocks along with gambling. Although the studies yielded mixed results, there is a strong prevalence that women are more risk averse in most matters including health, investments (Borghans,

Golsteyn, Heckman, & Meijers, 2009), insurance decisions and gambling (Barber & Odean, 2001). The wide-ranging empirical studies document the evidence of women's tendency of being less likely to undertake risks and more sensitive to losses than gains when compared to men.

In the corporate finance field of study, empirical evidence shows that board gender diversity enhances monitoring process (Melero, 2011), female executive, directors and board members are cautious in making corporate decisions (Huang & Kisgen, 2013) and more diligent monitors than their male counterpart (Adams & Ferreira, 2009). Corporate strategic decisions that are shown to have been impacted by the presence of female CEOs include lower leverage, less volatile earnings and higher chance of surviving when compared to similar firms run by male CEOs. It can be suggested that firms with the presence of female board members engage in less risk-taking or make less risky policy choices and investment decisions (Sila, Gonzalez, & Hagendorff, 2016).

A number of studies have analysed how bank risk is affected by CEO and senior executive gender (Berger, Kick, & Schaeck, 2014; Mara Faccio et al., 2016), the effect of female CEO on firm risk (Elsaid & Ursel, 2011) and the effect of board diversity on firm risk (Sila et al., 2016). Findings from the banking industries suggest that female CEO are more risk averse than their male counterpart (Berger et al., 2014; Mara Faccio et al., 2016). From the limited number of studies made on non-financial firm, the mixed findings make it difficult to arrive to a conclusion. A number of countries have passed legislation mandating female board representation, firms in emerging economies are not mandated to have female board members.

Drawing from the above literature, it can be postulated that females' nature of being risk-averse accentuates the possibility of female board members encouraging less risk-taking. Especially so in EMEs where ownership concentration is high and most of the personal wealth are concentrated in particular firm or group, it can be hypothesized that female directors will be more risk-averse than male directors.

***Hypothesis 3 (H3)** : Female directors are negatively related to firms' risk.*

4.2.4 Financial Institutions Nominees and Firm Risk

Financial institutions appoint representatives to sit on the board of firms it lends money to closely and actively monitor the firm's behaviour. These financial institutions can be either commercial banks, life insurance companies or investment banks. Having a representative on the board of directors is mainly a strategic position taken by financial institutions to obtain financial information that will benefit them, which can otherwise be very costly if the bank has no insider information. At the same time, by having representative on a firm's board of directors, the financial institution can curb managerial opportunism.

The fiduciary duty of directors to protect the interests of shareholders can be the source of conflict of interests on the part of the financial institutes nominees (Kroszner & Strahan, 1999). This is mainly because of the different payoff structures of debt and equity. This conflict of interest between the shareholders and lenders may contribute to the financial institute nominee in the board can have significant impact on the firm strategies mainly the firm risk-taking behaviour. In the case of India, apart from bank representatives, financial institute nominees also include insurance company representatives.

When it comes to risk-taking, the main aim of the representative is to ensure that board of directors do not make decisions that are detrimental to the firms' ability to repay debt or undertake excessive risk. However, in EMEs with the high ownership concentration the concern of the board of directors are more towards protecting the interests of minority shareholder and to ensure majority shareholders do not have access to excessive free cash flow.

Hypothesis 4 (H4) *: Financial institutes' representatives presence are positively related to firm risk.*

4.2.5 State Nominees and Firm Risk

Government and state ownership is quite common across the world (Boubakri et al., 2013; Claessens, Djankov, & Lang, 2000). In India, state government holds certain percentage of shares in private firms especially in development corporations. Even though the states' shareholding is minimal, they have representative sitting on board of the corporations. These state appointees, having the responsibility of protecting the interests of the states, will monitor and advice the board in favour of states' objectives. Thus, government intervention in the firms' strategic decisions is very likely.

As state agents, these board members may be responsible for achieving different objectives than the rests of the shareholders. One side of the literature suggests that the government share ownership has negative effect on corporate risk-taking (Boubakri et al., 2013; Uddin, 2016; Uddin, Halbouni, & Raj, 2014). They report that government ownership discourages firm from taking excessive risks due to promoting public employment, social stability, and political control over the economy, and supplementing government revenue by additional dividends incomes, capital gains, and corporate taxes (Uddin, 2016). Besides promoting economic efficiency, their interests also vest in the social effectiveness of any investments or projects. Hence, it can be argued that despite being minority shareholder, political pressure can be exerted to achieve government objectives.

However, the minimal number of state appointees on board firms with highly concentrated ownership may function differently from widely held firm. The state appointees on board, that do not interfere with the day-to day operations of the firm, are said to be influential monitors. It is claimed that state owned firms have better corporate governance than publicly traded companies (Ang & Ding, 2006), hence, board with state appointees can be expected to serve the interests and protections of minority shareholders. Which denotes that state appointees would discourage excessive free cash flow available to owner-manager by encourage undertaking of more investment. Hence, the relationship between state nominees and business group risk-taking is expected to be positive.

Hypothesis 5 (H5) *: State appointees presence is positively related firm risk.*

4.2.6 CEO Duality and Firm Risk

CEO duality is when a person holds both the Chief Executive Officer and board chairperson positions in a firm. Having dual positions denote that the person is mainly responsible for firm strategic decisions. However, the CEOs will not adopt a separate leadership structure for the two positions. The board of directors being the apex of the decision control system of firms will be led by CEO who has the responsibility for both making decisions to maximise shareholder value and monitoring those decisions on behalf of the firm. Having CEO that lead the decision control hierarchy will most likely result in compromises in the control system and eventual conflict of interest (Yang & Zhao, 2014). It also implies a higher authority and concentrated power in CEO's hand which enables CEOs to dominate and reduce board effectiveness in monitoring and controlling of the management. Therefore, this dual role may impair the ability of the rest of the board to monitor the CEO's activities that may result in potential agency problem.

According to agency theory, conflict of interests occurs when the CEO assumes the dual role (D'Aveni & Finkelstein, 1994). In firms with diluted ownership, the CEO of the firm will have decision rights but not necessarily hold control rights over shareholder capital. This can be the cause CEO have conflicting interests to the shareholders and do not always act to maximise shareholder value (Yang & Zhao, 2014). However, in the case of firms with concentrated ownership, the CEO is most likely to be a family member who holds significant ownership rather than a professional manager whose risk-taking incentive is controlled through pay-to-performance sensitivity. The literature on owner-CEO versus agent-CEO found that owner-CEO is more risk tolerant in comparison to agent-CEO (Eisenmann, 2002; Fahlenbrach, 2009; Fahlenbrach & Stulz, 2009) due to the vastly different economic pay-offs for their efforts in engaging in positive net present value yet risky projects (Amihud & Lev, 1981).

On the other hand, some other researchers argue that the benefits of CEO duality outweigh the negative impact. A CEO who is also the chair of the board enjoys greater benefits as the duality allows information on firm-specific strategic challenges and opportunities (Jensen & Meckling, 1995) readily available to the board chairperson. Having this specific knowledge enable the CEO to coordinate board actions and execute strategies that can give the firm competitive edge specifically in harsh business conditions (Eisenmann, 2002). Similarly, consolidation of power and decision making in the hands of the CEO is beneficial in making firm strategic decisions such as firm-risk mainly because the CEO will be able to make informed decisions.

CEOs in group-affiliated firms and non-group firms in India have high shareholding and higher sunk costs because they have invested greater time, energy and resources (Tang, Li, & Liu, 2016) which can curb their risk-taking appetite. With the CEO who is also the chair of board having long-term approach and greater firm-specific expertise, it is critical that the firm take only a reasonable amount of risk as the CEO will also be concerned about the survival of the firm. Accordingly, CEOs will be risk averse by avoiding investment in new business ventures or even entrepreneurial activities and subsequently influencing board decisions on firm risk-taking propensity.

This benefit of duality especially in a group setting allows clarity regarding strategic decisions that will shape the direction of the group as a whole. As excessive risks may expose the whole group to potential bankruptcy risk, CEO of group-affiliated firms may not make strategic decisions truly for economic reasons but also other consideration such as group survival. Hence, it is argued that power concentration on dual CEO who is risk-averse and subsequent ineffective controlling functions from the board suggest a negative relationship between CEO duality and firm-risk.

Hypothesis 6 (H6) *: CEO duality is negatively related to firm risk.*

4.2.7 The Model

In this study, the risk proxies, variance in stock returns (TTL_RISK) and residuals of market return model - unsystematic risk (RISK) will be regressed on all the possible variables that influence its value such as business group dummy (GROUP), crisis period dummy (CRISIS) and the interactions with business group. It is also crucial to control for the various firm specific characteristics such as firm size (SIZE), firm leverage (LEV), firm sales growth (SALES_GRW) and Tobin's Q (TOB_Q).

Building on this and to test the hypotheses, the linear regression model can be model as follows:

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta + Corporate\ Governance_{i,t}\delta + Control\ Variable_{i,t-1}\gamma + e_i \quad [1]$$

Whilst the random effects model for this study can be specified as follows:

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta + Corporate\ Governance_{i,t} + Control\ Variable_{i,t-1}\gamma + v_{i,t} \quad [2]$$

And the random effects model for this study including the crisis period can be specified as follows:

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta_1 + CRISIS_{i,t}\beta_2 + Corporate\ Governance_{i,t} + Control\ Variables_{i,t-1}\gamma + v_{i,t} \quad [3]$$

4.2.8 Robustness Tests

The main hypothesis of this study is that group affiliated firms will co-insure each other in the event of distress as proven by Claessens et al. (2006) that financially constrained firms benefit from group affiliation as they receive financial support when not financially viable. It can also be established that not all firms within the same group have the ability to co-insure every other firm in the group. Since the co-insurance effect is not de-facto for all the firms within the same group, group affiliated firms are able to take the risk when the benefits of co-insurance outweigh the costs of financial

distress in the case of negative outcome of investment. Building on these, arguably, corporate governance mechanisms play a role in monitoring firm risk-taking relative to group affiliates relative size.

To test on the robustness of these arguments, the weightage of particular affiliate towards the overall groups' total assets, total revenue and total cash flow are hypothesized to have negative effect on firm risk.

> ***Hypothesis 7 (H7)****: Affliates' size relative of overall group have negative effects on firm risk*

To test on these hypotheses the random effects model can be specified as follows:

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta_1 + CRISIS_{i,t}\beta_2 + BG * CRISIS_{i,t}\beta_3 + GROUP * SIZE\_WEIGHT\_Q2_{i,t}\beta_4 + GROUP * SIZE\_WEIGHT\_Q3_{i,t}\beta_5 + GROUP * SIZE\_WEIGHT\_Q4_{i,t}\beta_6 + Corporate\ Governance_{i,t} + Control\ Variables_{i,t-1}\gamma + v_{i,t} \quad [5]$$

4.2.8.1 Behavioural Factor

Similar to chapter 3, to further analyse the likelihood that group affiliates co-insurance effects have different effects on affiliates with different characteristics, a second robustness test is included to analyse if group affiliates assume a different strategy when in financial distress and financially safe. Applying the reasoning of prospect theory, group affiliated firms are likely to frame their strategy to avoid higher firm risk in affiliates that are safe from financial distress and undertaking higher risk in affiliates that are in the danger of financial distress.

Hypothesis 8 (H8)*: Affiliates bankruptcy risk has positive effects on firm-risk.*

To verify the testable hypothesis H8, the relationship between firm risk and group firm is estimated using the following random effects specification (7) to have an estimate of the group risk-taking on bankruptcy score computed using the methods proposed by Altman (2005) described in detailed in the following section.

$$RISK_{i,t} = \alpha + GROUP_{i,t}\beta_1 + CRISIS_{i,t}\beta_2 + BG * CRISIS_{i,t}\beta_3 + DISTRESS_{i,t-1}\beta_4 + GROUP * DISTRESS_{i,t-1}\beta_5 + SAFE_{i,t-1} + GROUP * SAFE_{i,t-1}\beta_6 + Corporate\ Governance_{i,t} + Control\ Variables_{i,t-1}\gamma + v_{i,t} \quad [6]$$

4.2.9 Definition of Variables

Corporate governance variables

The role of corporate governance mechanisms has been subject to considerable empirical analysis and therefore, we include in this study a number of corporate governance mechanisms specially board characteristics. The board of directors of a firm is meant to perform the critical functions of monitoring and advising top management (Coles et al., 2008) and based on Fama (1980) and Jensen & Meckling (1976) arguments that board of directors are central internal control mechanism for monitoring and influencing managerial strategic decisions, we include the following various board characteristics as independent variables to analyse the effect on firm risk-taking;

- board size (BOD) – studies suggest that board size matters in determining the effectiveness of monitoring and functioning. Lipton et al. (1992) suggest that larger boards could be less effective than smaller boards in monitoring due to coordination and free-rider problems.
- board independence (defined as the proportions of independent directors against total board size) (ID_PROP) – the increasing trend around the world towards board independence shows the common believe that greater level of board independence allow more competent monitoring and effective in protecting minority shareholder's rights. Starting from US, many countries issued recommendation and event mandatory guidelines on minimum requirement of independent directors.
- proportion of female directors (FE_PROP) – psychology and behavioural studies on risk-taking behaviour and investment decisions show gender differences in attitude towards risk-taking. Studies have shown inconclusive results. Adams & Funk (2012) show that female directors are risk-seekers and Farrell & Hersch (2005) find inverse relationship between female directors and firm-risk.

- number of financial institute nominees (FI_INS) – financial institute investors appoints nominees to the board to look after the interest of shareholders.
- number of state nominees (STATE) – firms such as state development corporations have representatives on the board to represent the state.
- CEO duality (CEO_DUAL) - CEO-chairman duality is when the same person makes firm decisions and also have the duty to monitor those decisions. The concentration of power on a single person can only mean the same attitude towards risk-taking

4.3 Data

4.3.1 Data Description

Table 4.1: Definitions of Variables
This table describes the variables in this study and the definitions of the variables

Variables	Definitions
TTL_RISK	Total risk is variance of daily stock price using 60 days price. The variance is then annualised to get yearly variance.
UNSYS_RISK	Unsystematic risk is the residual of single-index market model (Sharpe, 1963) decomposed from total risk.
SYS_RISK	Systematic risk is the product of the firms' beta times the market daily returns.
BG	Dummy variable: 1 if the firm is a business group member; 0 otherwise
BOD	Total number of executives in board of directors
ID_PROP	Proportion of independent directors within the board of directors
FE_PROP	Proportion of female directors within the board of directors
FI_INS	Representatives of financial insitute on board of directors
STATE	Representatives of financial insitute on board of directors
CEO_DUAL	Dummy variable: 1 if CEO of the firm is also the Chairman of Board of Directors; 0 otherwise
SIZE	Natural log of one year lagged total assets, Ln (Total Assets t-1)
LEV	One year lagged debt-to-equity ratio, (Debt t-1/Equity t-1)
AGE	One year lagged of years since firm incorporation
SALES_GRW	(Sales t - Sales t-1/Sales t-1)
TOB-Q	(Market Value / Book Value) t-1
CRISIS	Dummy variable: 1 if year is 2008 and 2009; 0 otherwise
POST-CRISIS	Dummy variable: 1 if year is 2010 - 2014; 0 otherwise
SIZE_WEIGHT	Total assets of Firm it / Total Assets of Group t
REV_WEIGHT	Total Sales of Firm it / Total Sales of Group t
CF_WEIGHT	Total cash flow of Firm it / Total cash flow of Group t
DISTRESS	Dummy variable: 1 if the firm is in distress zone; 0 otherwise
GREY	Dummy variable: 1 if the firm is in grey zone; 0 otherwise
SAFE	Dummy variable: 1 if the firm is in safe zone; 0 otherwise

4.3.2 Summary Statistics

Appendix C reports the summary of the 2 digit industry code of both group and non-group firms across 2008-2014. From the total sample of 9,853 firm-years, 41.9% are group firms and the remaining 58.1% are non-group firms. Both types of firms are well represented in our sample with the exception of 2 industries.[7]

Table 4.2 reports the summary statistics of both the independent and dependable variables for both group and non-group firms. Non-group firms have 9.6% higher total risk median than group firms. The median of unsystematic risk of non-group firms is 7.3% higher than group firms. The summary statistics of the corporate governance variables show that on average group firms are better governed than non-group firms. The median of board size of group firms is found to be 43% larger than non-group firms. The median of proportions of independent directors in both group and non-group firms are similar at 50 percentage. In contrast to other board characteristics, the proportions of female directors in non-group firms 28.6% are higher than group firms. Both financial institute nominees and state appointees in group firms are marginally higher than non-group firms. CEO duality is slightly more common in group firms than non-group firms, which is about 8% higher in group firms.

Table 4.2: Descriptive Statistics of Variables for Group and Non-Group Firms
This table reports the descriptive statistics of the independent and dependent variables of group and non-group firms.

Variables	Group					Non-Group				
	N	Min	Mean	Median	Max	N	Min	Mean	Median	Max
TTL_RISK	4128	2.29	10.94	10.64	35.56	5725	2.29	13.76	14.02	56.75
UNSYS_RISK	4128	1.72	8.85	8.34	33.29	5725	1.72	11.15	11.10	56.47
BOD	4128	1.00	9.77	10.00	21.00	5725	1.00	7.80	7.00	24.00
ID_PROP	4128	0.00	0.49	0.50	1.00	5725	0.00	0.48	0.50	1.00
FE_PROP	4128	0.00	0.05	0.00	1.00	5725	0.00	0.07	0.00	1.00
FI_INS	4128	0.00	0.18	0.00	1.00	5725	0.00	0.06	0.00	1.00
STATE	4128	0.00	0.04	0.00	1.00	5725	0.00	0.02	0.00	1.00
CEO_DUAL	4128	0.00	0.94	1.00	1.00	5725	0.00	0.87	1.00	1.00

[7] Books & cards and Motor vehicles, trailers & semi-trailers industry have small samples and are only present in non-group and group categories respectively.

Endorsing the findings in Table 4.2, the univariate analysis of annual equality of mean and median between group and non-group firms in Table 4.3 once again show that group firms have lower risk in comparison to no-group firms. Throughout the years, both TTL RISK and UNSYS RISK of group firms are significantly lower risk than non-group firms and on the increasing trend until 2012 and reduced in 2013 and 2014.

Table 4.3: Annual Equality of Mean and Median of Dependent Variables
This table reports the univariate analysis of annual equality of mean and median of the ownership types. The difference-in-means t-tests assume unequal variance across groups. Wilcoxon rank-sum test is used to test for differences in the median. *, ** and *** indicate that group firms are significantly higher than non-group firms at 10%, 5% and 1% significance level respectively.

		TTL RISK		UNSYS RISK	
Year	**N**	**Mean Test**	**Median Test**	**Mean Test**	**Median Test**
2008	1331	-7.354***	-8.503***	-7.690***	-8.808***
2009	1361	-8.914***	-9.488***	-8.583***	-9.212***
2010	1421	-12.957***	-12.756***	-12.929***	-12.765***
2011	1448	-12.815***	-12.269***	-12.100***	-11.998***
2012	1456	-12.990***	-12.313***	-11.398***	-11.322***
2013	1434	-10.262***	-10.199***	-7.992***	-8.510***
2014	1402	-11.341***	-11.382***	-8.972***	-9.292***
Total	9853	-25.891***	-26.011***	-24.332***	-25.154***

Similarly, Table 4.4 also affirms the findings in Table 4.2 that with the exception of proportion of female directors, all other corporate governance measures of group firms are significantly higher than non-group firms. This table once again concurs to the earlier argument that group firms are better governed compared to non-group firms.

In Table 4.5, the equality of mean and median of the control variables are presented. These mean and median tests provide equal results to indicate that group affiliates are significantly larger (SIZE), high in leverage (LEV), older (AGE) and have higher future growth opportunity (TOB_Q) than non-group firms. Even though, the difference in average sales growth (SALES_GRW) between group and non-group firms are not statistically significant as the rest of the variables, on average it is evident that sales growth of non-group firms is higher than that of group firms.

Table 4.4: Annual Equality of Mean and Median of Independent Variables between Group and Non-Group Firms

This table reports the univariate analysis of annual equality of mean and median of all the independent variables. The difference-in-mean t-test assume unequal variance across groups. Wilcoxon rank-sum test is used to test for differences in the median. *, ** and *** indicate that group firms are either higher (+ sign) or lower (- sign) than non-group firms at 10%, 5% and 1% significance level respectively.

Year	N	BOD		ID _PROP		FE_PROP		FI_INS		STATE		CEO_DUAL	
		Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test
2008	1331	11.087***	11.105***	3.172***	2.079***	-2.664***	-1.599*	8.113***	8.366***	2.438***	2.538***	5.125***	4.837***
2009	1361	11.037***	11.067***	1.919***	0.842	-2.404***	-1.688*	6.750***	7.054***	1.858***	1.929**	4.172***	3.964***
2010	1421	11.149***	11.252***	2.047**	1.896**	-3.062***	-2.155**	6.932***	7.381***	2.361***	2.495***	3.912***	3.725***
2011	1448	12.412***	12.035***	1.456**	0.866	-2.537***	-1.420	6.963***	7.427***	2.552***	2.708***	4.575***	4.304***
2012	1456	13.028***	12.444***	2.341***	2.172**	-2.231***	-1.467	6.885***	7.433***	2.610**	2.794***	4.447***	4.182***
2013	1434	13.275***	12.450***	2.214***	1.913**	-3.153***	-2.499***	6.422***	6.868***	2.310***	2.465**	5.172***	4.802***
2014	1402	11.973***	11.703***	2.646***	2.054**	-3.043***	-2.457***	6.107***	6.488***	1.793***	1.886**	4.228***	4.009***
Total	9853	31.604***	30.991***	5.819***	4.349***	-7.258***	-5.038***	18.291***	19.375***	6.067***	6.399***	11.949***	11.270***

Table 4.5: Annual Equality of Mean and Median of Control Variables between Group and Non-Group Firms

This table reports the univariate analysis of annual equality of mean and median of all the independent variables. The difference-in-mean t-test assume unequal variance across groups. Wilcoxon rank-sum test is used to test for differences in the median. *, ** and *** indicate that group firms are either higher (+ sign) or lower (- sign) than non-group firms at 10%, 5% and 1% significance level respectively.

Year	N	SIZE		LEV		SALES_GRW		AGE		TOB_Q	
		Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test	Mean Test	Median Test
2008	1331	18.897***	16.934***	1.622***	1.908**	-1.358**	-0.946	9.828***	11.020***	3.567***	4.349***
2009	1361	18.757***	16.831***	1.777***	2.123**	-1.639**	-0.509	10.325***	11.379***	2.041**	4.143***
2010	1421	18.283***	16.529***	1.601**	1.691*	-1.643**	-0.384	10.639***	11.719***	3.795***	5.750***
2011	1448	18.099***	16.429***	0.806	1.691*	-0.698	-0.377	10.970***	12.022***	3.879***	5.424***
2012	1456	18.734***	16.805***	0.342	1.284	1.103	1.694*	10.986***	12.095***	3.235***	4.411***
2013	1434	18.341***	16.411***	0.702	0.863	-0.032	-0.324	10.607***	11.761***	3.037***	4.645***
2014	1402	18.262***	16.346***	0.582	0.950	-2.327***	-3.028***	10.762***	11.740***	3.218***	4.379***
Total	9853	48.584***	43.765***	2.703***	3.908***	-2.084***	-1.305*	28.076***	30.945***	8.740***	12.109***

The computation of Pearson correlation coefficient is shown in Table 4.6 to indicate the strength of the correlation coefficients between the variables. This suggests the absence of multicollinearity in the regression model. The unsystematic risk is highly correlated to total risk as considerable proportions of total risk are made of unsystematic risk. However, this does not pose a problem as both the risk measures are dependent variable.

The variation inflation factors (VIF) and the tolerance values (1/VIF) is presented in the first four columns of the table. The first two columns report the VIF and 1/VIF for TTL_RISK and the following two columns report VIF and 1/VIF of UNSYS_RISK. High VIF value denote multicollinearity and the most common cut-off threshold is a value of 10. This is to ensure there is no serious collinearity problems between the variables. The highest VIF of 1.92 for firm size shows that there are no collinearity problems as the VIF values are below the threshold of 10. Next using the bivariate Pearson can increase the understanding of causal relationship among variables. This correlation measures how variables are related to each other and coefficient has possible values between +1 and -1. The value indicates the strength of the relationship and the + and – indicates the direction. The overall results indicate that multicollinearity does not pose a serious problem to the results as they are all within the recommended range.

Table 4.6: Pearson Correlation Coefficients Matrix

This table presents the Pearson correlation coefficients matrix of both dependent and control variables

	TTL RISK		UNSYS RISK								
	VIF	**1/VIF**	**VIF**	**1/VIF**	**TTL RISK**	**UNSYS RISK**	**SIZE**	**LEV**	**SALES-GRW**	**AGE**	**TOB_Q**
TTL RISK	**-**	**-**			1						
UNSYS RISK			-	-	-	1					
SIZE	1.08	0.92	1.08	0.92	-0.511***	-0.489***	1				
LEV	1.02	0.98	1.02	0.98	0.095***	0.105***	0.122***	1			
SALES_GRW	1.02	0.98	1.02	0.98	0.008	-0.018	0.025*	-0.021*	1		
AGE	1.05	0.96	1.05	0.96	-0.160***	-0.157***	0.197***	0.012	-0.058***	1	
TOB_Q	1.04	0.96	1.04	0.96	-0.195***	-0.201***	0.165***	-0.005	0.106***	0.070***	1

4.4 Regression

In this section the findings from the empirical tests are reported. On each of the tables, results are reported for the firm level regressions. Standard errors are clustered by group in all of the random-effects regressions.

4.4.1 Results and Discussion

In section A, the results of equations (2), (3) and (4) that examine the effect of corporate governance on firm risk including crisis period is reported. Section B discusses the effect of corporate governance on firm risk according to group affiliates' weightage of size (eq. 5), sales revenue (eq. 6) and cash flow (eq. 7) on firm risk. Section C describes the results from the regressions of effect of financial distress on firm risk (eq. 8). All the regressions were done by clustering group id (VCE/Cluster Group) to address the endogeneity problem and the independent variables are one year lagged.

A. Corporate Governance and Firm Risk Results. (Hypothesis 1-6)

The results of regression estimates are presented in Table 4.7. Using the two measures of firm risk, the first estimate presented in column (1) and column (4) is the OLS regression for group and non-group firms for TTL RISK and UNSYS RISK respectively. It is shown that group affiliated firm risk is lesser than non-group firms' risk for both risk measures with -2.698 for TTL RISK and -2.126 for UNSYS RISK. The difference is statistically and economically significant.

Next, in column (2) and column (5) the OLS regression estimates for both risk measures are reported. The regression now includes the corporate governance mechanisms and control variables. It is now observed that there is an increase in group affiliated firms' risk compared to non-group firms when corporate governance mechanism and control variables are included. However, the results are now not statistically significant and even then, non-group firms are still taking lower risk in comparison to group firms. This seems to suggest that the presence of corporate governance mechanism encourages risk-taking in group affiliated firms.

In column (3) and (6) the random effects model estimates for TTL RISK and UNSYS RISK are reported. Even though the relationship between group affiliated firm and both risk measures are now insignificant, the inclusion of the rest of the variables yield exactly the similar effect as the OLS regression effect.

As seen in the table, the crisis dummy (CRISIS) indicate the level of firm risk of both types of firms in the sample. In column (2) and (5) show that the inclusion of crisis period into the regression increases TTL RISK is very high (3.3767 & 3.1952) in comparison non-crisis period. UNSYS RISK in column (5) and (6) are a little lower (2.0092 & 1.9535) than TTL RISK. The high TTL_RISK in comparison to UNSYS_RISK proves that all types of firms in this context are highly affected by the market-level risk. This result is predictable as the financial crisis will have more impact on systemic risk than on firm's idiosyncratic risk. In the next row, to examine the effect of group affiliation in the crisis period, group dummy is integrated with the crisis dummy (BG * CRISIS). It is established that group firms are highly affected by firm risk than non-group firm during the financial crisis and once again it is evident that TTL_RISK (1.252 & 1.216) are higher than that of UNSYS_RISK (0.693 & 0.656).

Inclusion of corporate governance variable and accounting for the control variables that remain constant to control any determinants of firm risk, the following section discusses the results of both OLS and random effect model regression estimates:-

Hypothesis 1 (H1)

Size of Board of Directors - The role of board of directors as the representatives of the shareholders and other stakeholders of the company is to monitor and advice the managers specially the strategic decisions. As discussed in the hypothesis section, the results show that large group of board members face pressure of conformity and difficulty in reaching consensus, hence, accepting less risky projects. Additionally, large size of board members indicates the presence of people from diverse fields which show the extent of knowledge and expertise of the individual members. Taking

advantage of this, the pool of experts is utilised for making strategic decisions in firm risk show that larger boards are negatively related to firm risk indicating that the direction of the influence depends on the extent to which board is able to reach consensus as a whole. It shows that the bigger the board size the less risk the firm undertake which is supported by previous literature as discussed on the hypothesis development section. The results show that the bigger board size that is delegated with the monitoring task act better in the best interests of all shareholders and do not differentiate group and non-group as both the firm have lower risk as the interaction between board size and group firm does not give any statistically significant result.

Hypothesis 2 (H2 and H2a)

Proportion of Independent Directors – As per hypothesis 2 (H2) the proportion of independent directors on board of directors significantly affects firm risk. Both TTL RISK and UNSYS RISK are positively related to the proportion of independent directors indicating that independent directors encourage firm risk for all firms. This is supported by our earlier argument that independent directors, especially when regulated mandatorily to not have no material relationships with the company, are expected to monitor the owner-manager's activities, such as tunnelling, diversification and bailing out weak affiliates acting in the best interest of minority shareholders.

Subsequently, hypothesis H2a is also supported by the findings. Results of the regression in Table 4.7 suggest that the moral hazard in group affiliated firms due to the presence of co-insurance influences. Independent directors discourage firm risk in group affiliated firms because independent directors are concerned that pursuing risky investment may affect other firms in the group as all the firms are interdependent for internal capital market. The compulsion of providing co-insurance for other affiliates within the group and the fact that not all the group affiliated firms are de-facto receivers of this benefit, independent directors discourage risk-taking in group affiliated firms

Hypothesis 3 (H3)

Proportion of Female Directors – Prior to 2014, there was no regulations in India to make appointment of female directors mandatory, hence the low level of female representative on board. Even though the proportion of female directors on board of directors is considerably low, similar to other corporate governance variance the proportion of female directors is positively related to firm risk indicating that female directors encourage firm risk, which is not supported by our earlier hypothesis. Correspondingly, the proportion female directors does not affect firm risk of group and non-group firms differently. It is observed here that the objective of the female directors corresponds with the one of independent directors on board, whereby in order to mitigate expropriation by the entrenched managers, female directors encourages more risk-taking most likely in the form of new investments in positive NPV projects and reducing the accessibility of free cash flow to majority shareholders who also hold the managerial positions.

Hypothesis 4 (H4)

Financial Institute Nominees - The findings of both OLS (column 2 and 5) and random-effect regression (column 3 and 6) provide similar findings. On average, the presence of financial institute's representative on board of directors have positive significant coefficient to firm risk for both types of firms. The risk-taking of group firm is not significantly different from non-group firms as the coefficient is not statistically significant. More specifically, in India, typically one representative from the bank that lend largest amount of money sits on the board of directors. All large banks in India, with the exception of ICICI are state-owned banks. Agency theory would suggests that financial institute nominees on board of directors will increase monitoring and discourage firm risk, however, state-owned banks have been argued to lack the incentives to monitor and their lending pattern increases and decreases to play countercyclical role (Micco & Panizza, 2006)

Hypothesis 5 (H5)

State Appointee – State appointee on board are positively related to TTL RISK and UNSYS RISK for both types of firms. As we have discussed in the hypotheses section, state appointee does not interfere with the day-to-day operations of the firm. However, as noted in the previous paragraph, even though the number of state appointee on board of a firm (if any) is usually one, the state appointee on board play similar role as the state-owned banks and explains the result and its relations to the hypothesis. Similar to state-owned banks, state appointee may lack the incentives to monitor majority shareholders, however, state appointee acts largely in line with the views of financial nominees and independent directors.

Hypothesis 6 (H6)

CEO Duality – Even though CEO duality was argued to be a 'double-edged sword' that can either entrench CEO of the organisation by challenging a board's ability to effectively monitor and discipline management or the concentration of the power of a CEO and board chairman creates an explicit firm leadership structure that may facilitate decision-making (Deman, Jorissen, & Laveren, 2018). It is observed from the results that CEO of firms, regardless of group or non-group, discourage firm risk. This corroborate with the argument that CEOs with dual power in firms with high ownership concentration are most likely to be a family member who hold significant ownership rather than a professional manager whose risk-taking incentive is controlled through pay-to-performance sensitivity. The literature on owner-CEO versus agent-CEO found that owner-CEO is more risk tolerant in comparison to agent-CEO (Eisenmann, 2002; Fahlenbrach, 2009; Fahlenbrach & Stulz, 2009) due to the vastly different economic pay-offs for their efforts in engaging in positive net present value yet risky projects (Amihud & Lev, 1981).

Firm Specific and Firm Risk Results

The effects of all the independent variables are similar across both the risk measurement and are mostly significant at 1% level with the exception of SALES_GRW. This is consistent with the summary statistics as shown in Table 4.7. The evidence shows that SIZE is negatively related to firm risk. Evidence from prior empirical studies shows that large firms (in term of assets) are more stable and are less prone to default (Harris & Raviv, 1991) hence are expected to take less risk than smaller firms. In this context where most firms have high ownership concentration, the survival of large firms is the main objective of the owners.

Firm leverage (LEV) has positive and significant correlation with firm risk as firm with higher leverage tends to lead to higher risk (Kwok & Reeb, 2000). While prior literature has time and again provided evidence that business group have higher leverage than stand-alone firms, very few direct evidence is given on the link between stand-alone firm, leverage and firm-risk. This is also evident in our sample. Typically, firms with higher leverage are deemed to have increased bankruptcy risk (Anderson et al., 2012). The very nature of our risk measurement which is variance of stock price which is the interpretation of market perceptions on firm implies that higher leverage indicates higher risk.

It is important to note that SALES_GRW and TOB-Q have negative coefficients for both the ownership types in spite SALES_GRW is statistically insignificant. The negative correlations of SALES_GRW and TOB-Q to firm risk indicate and firms with growth opportunity exhibit lower risk. This finding suggests that both group and non-group firms are not taking higher risk even when they have historical growth and potential growth in the future. These firms could potentially increase growth level if they invest in R&D or innovative industries, however, our findings show otherwise. The plausible explanation for the findings possibly lies on prior literature suggests that family shareholding have strong incentives to monitor and that potentially influence the increase in efficiency of strategic decisions and in particular investment strategy and process (Anderson et al., 2012). This allows firm with high ownership

concentration to commit fewer resources on investments and still achieve similar outcomes.

Meanwhile, AGE is also negatively related to firm risk. This suggests that older firms tend to take less risk. This finding is well documented in previous literature that suggest older firms tend to be closer to their optimal size and therefore have less growth opportunity (Bilsen & Konings, 1998) that can lead inertia and rigidness in innovating (Kumar, 2004). Overall all these factors may lead to lower risk-taking.

These findings continued across all the regression performed here forth. Hence, the relationship between control variables and firm risk will not be discussed for the rest of the hypotheses.

Table 4.7: Regression Regressions Results on the Relationship between Corporate Governance and Firm Risk

This table reports the basic OLS and random-effects model regression on the relationship of corporate governance and firm risk. The numbers in parentheses are standard errors. *, ** and *** indicate the significant level at 10%, 5% and 1% respectively

Variable	TTL RISK			UNSYS_RISK		
	(1)	(2)	(3)	(4)	(5)	(6)
BG	-2.6980***	-1.0456*	0.2095	-2.1259***	-0.1957	0.8509
	(0.1720)	(0.4915)	(0.4264)	(0.1976)	(0.4271)	(0.3731)
CRISIS		3.3767***	3.1952***		2.0092***	1.9535***
		(0.1152)	(0.1337)		(0.1756)	(0.1904)
*BG * CRISIS*		1.2519***	1.2157***		0.6925***	0.6557***
		(0.1691)	(0.1652)		(0.1311)	(0.1249)
BOD		-0.3037***	-0.0993***		-0.2368***	-0.0632***
		(0.0034)	(0.0065)		(0.0034)	(0.0160)
*BG * BOD*		0.0107	-0.0094		-0.0367	-0.0476*
		(0.0326)	(0.0270)		(0.0277)	(0.0229)
ID_PROD		1.1620***	0.6845***		-0.6762***	0.2600**
		(0.0406)	(0.0591)		(0.0412)	(0.0809)
*BG * ID_PROP*		-1.4247*	-0.5317		-0.7752	0.0046
		(0.6037)	(0.5476)		(0.5400)	(0.4974)
FE_PROP		1.3150***	0.8233***		1.0852***	0.6974***
		(0.0604)	(0.0691)		(0.1046)	(0.1357)
*BG * FE_PROP*		1.8808	-1.2310		-1.8015	-1.3549
		(1.2264)	(0.9884)		(1.0509)	(0.8868)
FI_INS		0.2734***	0.5310***		0.2637***	0.4509***
		(0.0111)	(0.0303)		(0.0123)	(0.0374)
*BG * FI_INS*		0.1488	0.1047		0.0717	0.0161
		(0.2610)	(0.2335)		(0.2455)	(0.2111)
STATE		1.0475***	0.5314***		0.7121***	0.3263***
		(0.0328)	(0.0426)		(0.0247)	(0.0486)
*BG * STATE*		1.0695*	-0.8797*		-0.7433	-0.6248
		(0.4674)	(0.4170)		(0.4538)	(0.3951)
CEO_DUAL		-0.1941***	-0.1493***		-0.0732	-0.0384
		(0.0358)	(0.0324)		(0.0375)	(0.0279)
*BG * CEO_DUAL*		-0.8475	-0.5740		-0.9651*	-0.7123*
		(0.4512)	(0.3834)		(0.3910)	(0.3513)
SIZE		-1.4632***	-1.3821***		-1.1831***	-1.1080***
		(0.0479)	(0.0484)		(0.1193)	(0.1167)
LEV		0.2677***	0.2574***		0.2355***	0.2261***
		(0.0181)	(0.0178)		(0.0224)	(0.0211)
SALES_GRW		-0.0533	-0.0309		-0.2180*	-0.1979
		(0.0914)	(0.0881)		(0.1076)	(0.1026)
AGE		-0.0163***	-0.0157***		-0.0147***	-0.0141***
		(0.0042)	(0.0039)		(0.0034)	(0.0031)
TOB_Q		-0.1716***	-0.1655***		-0.1596***	-0.1543***
		(0.0337)	(0.0335)		(0.0291)	(0.0290)
Intercept	20.8494***	18.1110***	19.6828***	16.8609****	15.3577***	16.5551***
	(0.4367)	(0.3212)	(0.3344)	(0.3085)	(0.3193)	(0.3939)
Observations	9853	9853	9853	9853	9853	9853
R-Squared	0.232	0.310	0.455	0.383	0.376	0.375
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
VCE Group/Cluster	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

B. Affiliates' Size and Firm Risk Results

Hypothesis 7 (H7)

As reported in column (1-3) of Table 4.8, the outcome of the analyses, for both TTL RISK and UNSYS RISK, discloses that group firms in the three quartiles (q2, q3 and q4) take lower risk than that affiliates that are in q1. The findings for firm size are not statistically significant but firms' revenue and cash flow, especially in q3 & q4 are significant. The findings imply that group affiliates especially the bigger contributor towards the groups' overall revenue and income are risk averse compared to affiliates that contribute less towards overall group. This is the case for both revenue and cash flow.

The outcome reported in Table 4.8 repeatedly attest that affiliates that are the highest contributors towards groups value tend to take lower risk. The finding corroborates our earlier findings in chapter 3 that cash flow, being the most liquid compared to total assets and sales revenue, are the immediate resources that can be reallocated to other affiliates within the group. This evidence suggests that board of directors are equally concerned about firm survival as well as protecting minority shareholders (as it was shown before).

Table 4.8: Regressions Results on the Relationship between Corporate Governance, Firm Characteristics and Firm Risk

The regression in column (1) reports the random-effects estimation eq.5 to measure effect of group ownership on firms' size weight on overall group size. Column (2) reports the random-effects estimation on eq.6 to measure effect of group ownership on firms' revenue weight against overall group revenue. Column (3) reports the regression of eq.7 to measure the effect of group ownership on firms' cash flow weight. Numbers in parentheses are standard errors. The dependent variables are the two (2) risk measures. The independent variables are the interaction between business group and size of individual firm against group size in three quartiles, lagged size, leverage, sales growth, age and Tobin's Q. *, ** and *** indicate the significant level at 10%, 5% and 1% significance level, respectively.

Variable	TTL RISK			UNSYS RISK		
	(1)	(2)	(3)	(1)	(2)	(3)
BG	0.3388	0.5558	0.3293	1.0845**	1.2160**	1.0061**
	(0.4407)	(0.4521)	(0.4263)	(0.3832)	(0.3868)	(0.3718)
CRISIS	3.2079***	3.2038***	3.2102***	1.9694***	1.9625***	1.9733***
	(0.1283)	(0.1300)	(0.1267)	(0.1853)	(0.1872)	(0.1818)
*BG * CRISIS*	1.1675***	1.1722***	1.1835***	0.6041***	0.6102***	0.6121***
	(0.1698)	(0.1707)	(0.1692)	(0.1279)	(0.1296)	(0.1286)
BOD	-0.1071***	-0.1093***	-0.1073***	-0.0700***	-0.0714***	-0.0699***
	(0.0067)	(0.0065)	(0.0066)	(0.0163)	(0.0153)	(0.0159)
*BG * BOD*	0.0195	0.0274	0.0193	-0.0350	-0.0293	-0.0366
	(0.0286)	(0.0287)	(0.0282)	(0.0242)	(0.0243)	(0.0237)
ID_PROD	0.6843***	0.6917***	0.6885***	0.2598***	0.2641***	0.2639***
	(0.0587)	(0.0553)	(0.0565)	(0.0780)	(0.0752)	(0.0738)
*BG * ID_PROP*	0.5569	-0.5686	-0.5346	-0.0362	-0.0330	0.0012
	(0.5467)	(0.5468)	(0.5434)	(0.4995)	(0.4973)	(0.4920)
FEMALE	0.1044***	0.1046***	0.1043***	0.0690**	0.068624**	0.0687**
	(0.0216)	(0.0217)	(0.0219)	(0.0218)	(0.0219)	(0.0219)
*BG * FEMALE*	-0.1278	-0.1297	-0.1205	-0.1303	-0.1309	-0.1216
	(0.1190)	(0.1191)	(0.1200)	(0.1029)	(0.1029)	(0.1038)
FIN_INS	0.5261***	0.5237***	0.5300***	0.4430***	0.4424***	0.4489***
	(0.0284)	(0.0282)	(0.0295)	(0.0346)	(0.0339)	(0.0358)
*BG * FIN_INS*	0.1149	0.1337	0.1024	0.0351	0.0475	0.0143
	(0.2351)	(0.2346)	(0.2313)	(0.2123)	(0.2121)	(0.2078)
STATE	0.5443***	0.5535***	0.5464***	0.3378***	0.3443***	0.3395***
	(0.0431)	(0.0401)	(0.0422)	(0.0485)	(0.0454)	(0.0467)
*BG * STATE*	-0.9192*	-0.9225*	-0.8891*	-0.6637	-0.6616	-0.6294
	(0.4192)	(0.4126)	(0.4189)	(0.3974)	(0.3913)	(0.3976)
CEO_DUAL	-0.1483***	-0.1464***	-0.1462***	-0.0363	-0.0352	-0.0334
	(0.0321)	(0.0310)	(0.0311)	(0.0270)	(0.0259)	(0.0262)
*BG * CEO_DUAL*	0.5716	-0.5333	-0.5184	-0.70696*	-0.6703	-0.6412
	(0.3800)	(0.3802)	(0.3822)	(0.3486)	(0.3475)	(0.3476)
BG_SIZE_WEIGHT_Q2	-0.1006			-0.1954		
	(0.2747)			(0.2342)		
BG_SIZE_WEIGHT_Q3	0.0657			-0.1511		
	(0.2820)			(0.2696)		
BG_SIZE_WEIGHT_Q4	-0.3594			-0.5367		
	(0.2921)			(0.2891)		
BG_REV_WEIGHT_Q2		-0.4019			-0.4042	
		(0.2927)			(0.2445)	
BG_REV_WEIGHT_Q3		-0.5571			-0.5969*	
		(0.2969)			(0.2685)	
BG_REV_WEIGHT_Q4		0.7616*			-0.8039**	
		(0.3130)			(0.2895)	
BG_CF_WEIGHT_Q2			-0.0002			0.0363
			(0.1573)			(0.1510)
BG_CF_WEIGHT_Q3			-0.1034			-0.1495
			(0.1607)			(0.1435)
BG_CF_WEIGHT_Q4			0.5204**			-0.7024***
			(0.1582)			(0.1468)
SIZE	-1.3708***	-1.3566***	-1.3685***	-1.0896***	-1.0807***	-1.0893***
	(0.0446)	(0.0389)	(0.0429)	(0.1122)	(0.1059)	(0.1086)
LEV	0.2571***	0.2540***	0.2536***	0.2252***	0.2226***	0.2209***
	(0.0178)	(0.0177)	(0.0176)	(0.0213)	(0.0206)	(0.0197)
SALES_GRW	-0.0321	-0.0103	-0.0117	-0.1987	-0.1757	-0.1717
	(0.0884)	(0.0830)	(0.0841)	(0.1027)	(0.0943)	(0.0916)
AGE	0.0159***	-0.0154***	-0.0157***	-0.0141***	-0.0138***	-0.0141***
	(0.0038)	(0.0039)	(0.0038)	(0.0030)	(-0.0031)	(0.0031)
TOB_Q	-0.1647***	-0.1639***	-0.1624***	-0.1537***	-0.1528***	-0.1502***
	(0.0337)	(0.0341)	(0.0347)	(0.0291)	(0.0294)	(0.0304)
Intercept	19.8009***	20.0471***	19.8274***	16.7682***	16.9351***	16.7465***
	(0.3527)	(0.3603)	(0.3240)	(0.3499)	(0.3537)	(0.3568)
Observations	9853	9853	9853	9853	9853	9853
R-Squared	0.455	0.455	0.455	0.383	0.383	0.384
Year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
VCE Group/Cluster	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*

C. Behavioural Factor and Firm Risk Results

Hypothesis 8 H(8)

As reported in column (1-3) of Table 4.8, both TTL RISK and UNSYS RISK, show that both group affiliates and non-group firms assume similar risk under their respective condition. Similar to our findings in Chapter 3, applying the reasoning of prospect theory, firms that are already having the possibility of getting into financial distress do not take more risk. Both group affiliates and non-group firms frame their risk-taking strategy to avoid higher risk in firms that are safe from financial distress. This is especially if the firms are non-group firms. The findings are statistically significant. The outcome reported in Table 4.9 shows that both group affiliates and non-group firms that are financially sound are equally loss averse.

Table 4.9: Regression Results on the Relationship between Corporate Governance, Financial Distress and Firm Risk

The regressions in column (1) presents the estimation of eq.8. The table presents the effects of group ownership, interaction between group dummy and firm in distress and safe zones. Numbers in parentheses are standard errors. The dependent variables are the two(2) risk measures. The independent variables are the lagged size, leverage, sales growth, age and Tobin's Q. *, ** and *** indicate the significant level at 10%, 5% and 1% significance level, respectively

Variable	TTL RISK		UNSYS RISK	
	(1)	(2)	(1)	(2)
BG	0.6159	0.4834	0.4137	1.3424**
	(0.5217)	(0.4617)	(0.4656)	(0.4151)
CRISIS	3.5320***	3.2505***	2.1444***	1.9964***
	(0.1012)	(0.1282)	(0.1608)	(0.1874)
*BG * CRISIS*	1.2921***	1.2543***	0.7406***	0.7035***
	(0.1700)	(0.1660)	(0.1299)	(0.1247)
DISTRESS	0.8542***	0.2294***	0.7601***	0.2069***
	(0.0087)	(0.0215)	(0.0150)	(0.0503)
*BG * DISTRESS*	0.1134	0.1480	-0.0326	0.0167
	(0.2953)	(0.2780)	(0.2903)	(0.2840)
SAFE	-0.4600***	-0.4934***	-0.3168***	-0.2971***
	(0.0113)	(0.0246)	(0.0254)	(0.0219)
*BG * SAFE*	-0.7281**	-0.5326*	-0.9530***	-0.7955***
	(0.2333)	(0.2238)	(0.2149)	(0.2065)
BOD	-0.2966***	-0.0970***	-0.2288***	-0.0617***
	(0.0033)	(0.0063)	(0.0033)	(0.0150)
*BG * BOD*	0.0092	0.0102	-0.0378	-0.0461*
	(0.0320)	(0.0268)	(0.0272)	(0.0229)
ID_PROD	1.2079***	0.6904***	0.7091***	0.2665***
	(0.0389)	(0.0564)	(0.0400)	(0.0787)
*BG * ID_PROP*	-1.3907*	-0.4711	-0.7085	-0.0771
	(0.5966)	(0.5466)	(0.5340)	(0.4983)
FE_PROP	1.4726***	0.9003***	1.2126***	0.7521***
	(0.0526)	(0.0629)	(0.0965)	(0.1343)
*BG * FE_PROP*	-1.6337	-1.1550	-1.5733	-1.2687
	(1.1889)	(0.9856)	(1.0270)	(0.8905)
FIN_INS	0.1171***	0.4815***	0.1414***	0.4258***
	(0.0108)	(0.0318)	(0.0098)	(0.0489)
*BG * FIN_INS*	0.1381	0.0416	0.0261	-0.0754
	(0.2413)	(0.2237)	(0.2236)	(0.2002)
STATE	1.0125***	0.5340***	0.6883***	0.3384***
	(0.0327)	(0.0385)	(0.0242)	(0.0417)
*BG * STATE*	-1.0918*	-0.9352*	-0.7705	-0.6794
	(0.4507)	(0.4000)	(0.4335)	(0.3769)
CEO_DUAL	-0.1658***	-0.14273***	-0.0504	-0.0245
	(0.0334)	(0.0324)	(0.0347)	(0.0278)
*BG * CEO_DUAL*	-0.7896	-0.5557	-0.9069*	-0.6904*
	(0.4308)	(0.3781)	(0.3713)	(0.3457)
SIZE		-1.3614***		-1.0900***
		(0.0428)		(0.1115)
LEV		0.2136***		0.1878***
		(0.0186)		(0.0169)
SALES_GRW		0.0388		-0.1415
		(0.0841)		(0.0963)
AGE		-0.01543***		-0.0138***
		(0.0038)		(0.0030)
TOB_Q		0.15234***		-0.1424***
		-0.0364		(0.0313)
Intercept	18.1775***	19.9979***	15.3406***	16.7305***
	(0.2926)	(0.3273)	(0.2823)	(0.3779)
Observations	9853	9853	9853	9853
R-Squared	0.325	0.461	0.259	0.389
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Industry FE	*Yes*	*Yes*	*Yes*	*Yes*
VCE Group/Cluster	*Yes*	*Yes*	*Yes*	*Yes*

4.4.2 Conclusion

Effective corporate governance mechanism at firm level is highly important for firms to have access to financing, preferred cost of capital, higher return on equity, increased valuation and performance (Claessens & Laeven, 2003). Hence, the objective of this study is to identity the effectiveness of corporate governance in influencing corporate strategy. Although the importance of board of directors as a corporate governance at firm level has been previously questioned, our findings reveal that board of directors is effective in improving overall governance especially firm risk. The study finds evidence to support negative relationship between the number of directors on board of directors (the size of board of directors) firm risk. Contrarily, independent directors, female directors, financial institute nominees and state appointees have positive relationship towards firm risk. The findings of this study indicate that even though corporate governance is a product of developed economies, it is still effective in environment less transparent and the board members play crucial role in monitoring the owner-manager's strategic decisions in both group and non-group firms. Corporate governance is shown to be an important factor in influencing the strategic decisions of firms with concentrated ownership. It is not only an effective governance in emerging economies where enforcement is weak, but also successful in providing investors protection for minority shareholders. By encouraging risk-taking in firms with high ownership concentration, corporate governance can ensure that the private benefits of control of owner-manager is alleviated can ensure that large shareholders the power to expropriate minority shareholders. More importantly, better risk-taking can encourage entrepreneurial orientation and increase economic growth as a whole.

CHAPTER FIVE :
FIRM RISK AND CAPITAL STRUCTURE: TWO-WAY ANALYSIS USING STRUCTURAL EQUATION MODELLING

ABSTRACT

This study uses Structural Equational Modelling (SEM) to confirm the interrelationship between firm risk and capital structure. The overall model aims to examine the influence of corporate governance and relationship banking on firm risk and firm capital structure to explain firms' risk management strategies. Using firm level panel data of Indian listed manufacturing firms, the SEM model finds no difference in the two-way relationship of capital structure and firm risk between business groups and non-group firms. This suggests that both type of firms' strategic capital structure decisions are highly dependent on firm survival and limit the probability of going into financial distress. The model also yields implications that corporate governance is the key determinant of capital structure choices and firm risk of both group and non-group firms. It explains the dynamics of corporate governance in making strategic capital structure decisions based on each type of firms' ownership nature. However, relationship banking has equal influence on group affiliated and non-group firms' capital structure decisions.

Keywords: emerging economy, group affiliation, capital-structure, firm risk, structural equation modelling.

5.1 Introduction

Arguably, the total risk borne by any firm can be divided into non-capital risk and capital risk (Peterson, 1964). The non-capital risk aspect is a result of instability and uncertainty of the firm's market. The other aspect of firm risk is the capital risk which is result of adding debts into the capital structure. We have in the earlier chapters explored the non-capital risk by examining how business group affiliation, which are characterised by internal capital markets, influence risk-taking by firms, and how corporate governance structures affect risk-taking of business group affiliated and unaffiliated firms.

If risk-taking by firms is manifested in the variability of their revenues and cash flows, given a firm's capital structure, its likelihood of bankruptcy increases with the extent of the risk that it bears. The firm can then reduce the likelihood of bankruptcy either by adjusting its capital structure (Castanias, 1983) or by adjusting the risk it bears. Variants of these arguments can be found in a relatively small but interesting literature that relates risk management strategies of financial and non-financial firms to their capital structure (Froot, Scharfstein, & Stein, 1993; Froot & Stein, 1998; Stulz, 1996).

The relationship between risk and capital structure can also be approached in a different way, using the stylised framework of Jensen & Meckling (1976). Specifically, within the Jensen-Meckling framework, firm insiders can finance excessively risky projects using external debt (Williams, 1987). Leland (1998, pp. 1213) has argued that "[s]uch predatory behaviour creates agency costs that the choice of capital structure must recognize and control." He demonstrates that inability to "precontract risk levels before debt is issued" influences a firm's capital structure. The empirical literature on capital structure has, therefore, is pre-supposes that a firm's capital structure is determined by the volatility of its earnings, which is a measure of risk (Titman & Wessels, 1988).

A smaller literature has examined the relationship between capital structure and firm risk. For example, Mandelker & Rhee (1984) have found that a firm's operating and

financial leverage explains a large proportion of the variation in a firm's systematic risk.

It is evident that it could be instructive to jointly model a firm's risk-taking and capital structure decisions within the same empirical framework, to further extend the literature on risk-taking. Yet, there is very little recent research on this relationship between these two firm-level variables. In this chapter, we model firm-level risk and capital structure jointly, using a structural equation model (SEM) framework. Consistent with the earlier chapters, this framework enables us to compare the risk-capital structure relationship of business group affiliated and unaffiliated firms. Our prior is that since business group affiliated firms experience lower threat of bankruptcy on account of their internal capital market, risk-capital structure relationship would be different for these firms compared to the unaffiliated firms.

The SEM framework also enables us to push the envelope of empirical modelling of risk and capital structure in other ways. First, we are able to treat corporate governance as a latent variable that is influenced by observable board characteristics such as board size, board independence, and CEO duality. Second, since emerging market financial sectors are characterised by high information costs and transactions costs, such that capital structure may be influenced by mechanisms such as relationship banking that reduces at least the information cost. This aligns our framework to the literature that suggests that capital structure decisions may be influenced by the nature of the financial market – bank-based vs market-based (Rajan & Zingales, 1995) , as well as to the large literature on relationship banking.

5.2 Theoretical and Conceptual Framework

The focal point of this empirical research is the two-way relationship between firm risk and capital structure of the firms. The hypothesis is based on two logical arguments:

Even though Modigliani & Miller (1958) suggest that a firm's capital structure is insignificant from an economic view-point, other scholars suggest that the level of

firm debt may have effect on firm's behaviour such as firm risk (Jensen & Meckling, 1976; Myers & Majluf, 1984) .

Capital structure can be construed as a double-edged sword that, on one hand, it can be used to provide positive signal to investors (Gaud, Jani, Hoesli, & Bender, 2005) as high usage of debt may signal better performance to outside investors (Joshi, 2018). The issuance of debt allows the market to make inferences about a firm's strategies and performance. And on the other hand, high usage of debt firm may face higher bankruptcy cost as firm now has to meet higher debt repayment resulting in higher firm risk.

Taken together, capital structure and firm risk not only affect each other directly but also indirectly through other firm attributes.

5.2.1 The Mediating Role of Corporate Governance

The theory of capital structure by Modigliani & Miller (1958) pointed out that in frictionless market, capital structure of a firm is irrelevant. However, more than 4 decades later, other research theorize other potential determinant of capital structure. Jensen & Meckling (1976) identifies agency costs as one of the determinants of firm's capital structure. Corporate governance, a mechanism that is set to alleviate agency problems that arise due to the separation of ownership and management resulting in large deviation in cash and control rights (Berle & Means, 1932) is associated to capital structure decisions through agency costs. The enforcement of good governance is only feasible in countries with strong legal framework. Claessens & Laeven (2003) suggest that stronger legal environment which ameliorate governance helps develop better financial markets that attract investors to invest in firms with investment needs. Hence, it can be argued that in countries with developed corporate governance, firms' capital structure choices are influenced by corporate governance.

In emerging economies context, corporate governance is an enforced check and balance concerning minimizing the opportunistic behaviour of controlling shareholders towards minority shareholders. When it comes to capital structure, it a very common view in finance is that the wealth of shareholders maximizes when the

capital structure of the firm reaches optimal level. However, controlling shareholders in firms with concentrated ownership, who are also the entrenched managers of the firm, may not make financing decisions that maximise minority shareholders wealth. Therefore, the agency conflicts between majority and minority shareholders play a role in firms' financing decisions (Morellec, Nikolov, & Schurhoff, 2012). The objective of board of directors being effective monitoring, advising and improving firm practices to ensure firm managers act on the best interests of shareholders and work towards maximising shareholders value is an internal governance that is advantageous to minority shareholders. The presence of independent directors and non-executive directors on the board of both dispersed ownership and concentration ownership firms are very crucial in increasing the quality of monitoring, advising and improving firm practices (Crespí-Cladera & Pascual-Fuster, 2014). Hence, it lies with the board members of the firm to discipline the firm by making optimal capital structure decisions through governance.

Morellec et al. (2012) argue that an effective corporate governance system advances shareholders' interest by persuading managers to use more debt as well as to make more timely capital structure rebalancing. Overall, they show that agency conflicts have a first-order effect on capital structure decisions. This indicates that through good governance the tendency of controlling shareholders to favour low debt to equity ratio will be extenuated. Through enforcement of good governance, agency problems within firms are mitigated to certain extend and reduces information asymmetry between management and investors. Alleviated agency problems lessen agency cost which in return determine the capital structure of the firm. Hence, capital structure of firms and corporate governance are linked through their association with agency costs (Hasan & Butt, 2009).

From strategic and stability viewpoint, the uniqueness of the ownership structure of business groups and the co-insurance effect dictate that corporate governance will make capital structure decisions keeping in mind the survival of group as a whole. Even though encouraging debt over equity can discipline group affiliated firms' controlling shareholders, exposing group affiliated firm to possible bankruptcy will

affect the group as a whole. The co-insurance effect of group affiliated firms has an influence on firms' debt capacity. This effect is expected to be intense in affiliated firms that are big, large contributor towards the group's revenue and sales (refer to Chapter 4). Hence, coinsurance effect predicts a negative relationship between corporate governance and capital structure.

On the other hand, non-group firms are governed in a different manner than group affiliated firms. The ultimate objective of corporate governance when it comes to capital structure decisions is now purely to discipline controlling shareholders. Managers cum controlling shareholders of non-affiliated firms do not prefer debt as debt commitment restricts managerial flexibility (Jensen, 1986) and increases bankruptcy costs. Trade-off theory suggests that controlling shareholders make financing decisions by trading-off tax savings from debt financing against bankruptcy costs. In contrary, minority shareholders may prefer debt financing as debt constrains the private benefits of control accessible to managers cum controlling shareholders by reducing free cash flow and potential cash diversion (Jensen, 1986). Morellec et al., (2012) argue that the trade-off between agency cost of debt and the benefit of debt as the factor that disciplines controlling shareholders affect capital structure. Hence, it can be hypothesised that controlling shareholders of non-affiliated firms will turn down higher debt financing and corporate governance will do the exact opposite.

The opportunistic behaviour of managers may reduce in firms from the emerging economies because the ownership concentration of the firms rests in the hands large business groups or influenced family. When compared to firms with diluted ownership, majority shareholders of firms with concentrated ownership will not be effective in monitoring firm managers as the managers and the majority shareholders are often the same group of people. Since the interests of the managers and majority shareholders are closely aligned, which is maximise group/family wealth, majority shareholders lack the incentives to monitor the managers. Therefore, the need for internal governance that possesses the incentives to monitor both managers and the majority shareholders on behalf of the minority shareholders.

From this argument, it can be established that the corporate governance of firms play an important role in firms' capital structure choices and subsequently affects firm risk. The concentration of ownership in the hands of certain number of people within a family or groups can result in high agency costs. In the case of firms in emerging economies, as discussed before, both type of firms have high ownership concentration thus suffer from similar agency problems demonstrating that corporate governance plays a major role in shaping the capital structure of firms' with high concentration. Hence, the necessity to include corporate governance as a mediator in the SEM model.

5.2.2 The Mediating Role of Relationship Banking.

The pecking order theory firms suggests that firms prefer internally generated funds such as retained earnings before resorting to external finance. The theory posits that because of adverse selection firm owners prefer internal financing over debt (Myers, 1984). However, when only external financing is available, firms will turn to debt and equity will be the final choice. Pecking order theory recognises information asymmetry as another factor that effects firms' capital structure. In light of pecking order theory, firms prefer debt over equity. However, information asymmetry is a barrier for firms in acquiring debts.

Firm's capital structure is highly dependent on the degree of information asymmetry between controlling shareholder and other stakeholders. Firm managers and insiders are in possession of private information of the firm, such as investment opportunities and return streams (Harris & Raviv, 1991), which outside investors or creditors are less informed causing information asymmetry. The information asymmetry has an immense effect on firms' capital structure as it makes equity less desirable because external investors are not keen to invest in the firm.

The entities involved in making the capital structure decisions are also plagued with other issues that will be a concern to minority shareholders. In firms with diluted ownership, the role of managerial self-interest and entrenchment (Berger, Ofek, & Yermack, 1997; Friend & Lang, 1988) play a major role in financing decisions. Similarly, in firms with high concentration, the controlling shareholders are

entrenched, subject to non-diversifiable risk and bankruptcy risk were highlighted as among the main reasons for low level of debt.

Motivated to discipline controlling shareholders of firms, board of directors can make decisions on the allocation of debts, equity and other claims. (Grinstein, 2006). Addressing this problem through systematic governance ensures that minority shareholders are not appropriated. Encouraging debt in capital structure is an appropriate tool used to discipline the entrenched controlling shareholders (Harris & Raviv, 1988).

Debt is used as a disciplining device because default allows creditors the option to force the firm into liquidation if debt repayments are not fulfilled (Harris & Raviv, 1988). Hence, bank, one of the main creditors of firms, is taken into the equation to determine the two-way relationship between capital structure and risk. Although it is highly important to discipline firm managers or insiders, private information that is not freely available to banks increases cost of information asymmetry.

Even though pecking order theory suggests that firms have an apparent order when allocating capital structure and debt is the first choice when it comes to external financing arrangements, debt may not be readily available to firms with high ownership concentration. Moral hazard and adverse selection problems within firms with high ownership concentration require banks to invest in obtaining private information to make lending decisions and manage credit risk (Berger et al., 2008). Having a long-term relationship with banks helps resolve not only the moral hazard and adverse selection, but also several market imperfections in capital and intermediate product markets at lower costs (Mahmood & Mitchell, 2004). As firms with good reputation have the opportunity as well as ability to secure 1) financial resources and 2) at a significantly lower interest rate.

The long-term relationship with bankers proves to benefit both types of firms as a result of banks having easier means to make credit assessment of firms. Banker-customer relationship also serves as an advantage for bankers because banker are able establish their customers' creditworthiness much easier with the lower information

asymmetry and able to provide debts at a lower interest rates because of the lower cost of securing the private information (Li, Feng, Lu, & Song, 2015).

Having access to the co-insurance effect within the group, group affiliated firms are believed to have easier access in raising external financing due to lower bankruptcy risk (Mahmood & Mitchell, 2004), however, the opaqueness of group affiliated firms' ownership structure increases the degree of information asymmetry. This pose as a disadvantage to group affiliated firms to secure debt as this increased transaction costs compared to unaffiliated firms. Group affiliated firms are not at a superior position to secure lower interest rates relative to non-affiliated firms. Hence, the influence of relationship banking to both types of firms.

5.3 Structural Equation Modelling (SEM)

This study employs Structural Equation Modelling (SEM), hence in the section explains SEM, justification for using SEM followed by the data collection procedures, and regression analyses adopted in this chapter - SEM, Confirmatory Factor Analysis (CFA) and the Goodness of Fit Index (GFI).

This study uses Structural Equation Modelling (SEM) which is a comprehensive statistical approach to test hypotheses about relations among observed and latent variables. SEM is a collection of statistical techniques that allow examination of a set of relationships between one or more independent variables and one or more dependent variables. The independent variables and dependent variables in the analysis can be either continuous or discrete and either factors or measured variables. SEM is also referred to as causal modelling, causal analysis, simultaneous equation modelling, analysis of covariance structures, path analysis or confirmatory factor analysis. SEM overcomes the limitations in the traditional multivariate analysis. Some of the limitations of multivariate analysis include 1) the results of the analysis may be biased because of measurement error, 2) absence of model estimation to analyse several equations simultaneously, 3) not able to test hypotheses that are exploratory variables. Second generation multivariate analysis, such as SEM, developed to

overcome some weaknesses of the earlier analysis technique especially when the model involves a construct that is measured by a number of variables. The use of SEM technique is appropriate for several reasons 1) two-way relationship between capital structure and unsystematic risk can be modelled simultaneously, 2) SEM technique offers comprehensive estimates of measurement error, 3) SEM technique can consider both observed and unobserved variables into the model, 4) multiple structural equations can be estimated concurrently.

The empirical method used in this study is based on the statistical theory of unobserved variables that assumes multivariate normal data and a large sample size using SEM. The main idea behind using this model is to examine the relationship between an unobserved variable and a set of observable variables using covariance information. SEM does this by comparing a sample covariance matrix of the observed variables with parametric structure imposed on it by the hypothesized model.

Using SEM, the model will consider corporate governance and relationship banking as the latent variables and analyse the relationship to the observed variables using the covariance matrix of the latent variables. The latent variable approach was taken to address the cross-sectional data with multiple items that measure the same construct that incorporates the focus of the dimensional approaches with identifying latent mixture in the population (i.e. the interrelatedness among observed variables). Estimation of latent variable is done by analysing the variance and covariance of the observed variables. Hence, latent variable approach thereby combines the strength of conventional multilevel modelling and SEM.

To construct the model, the latent variable is measured in the first step linking the observed indicator variables in a factor analytical model also called measurement model. Second, the relationships between the latent variable and the observed explanatory (causal) variables are specified through a structural model. Different specifications can also be used to see which variables turn out to be significant. By using subsamples of business group and private firms it will be interesting to see which

variables have influence on the capital structure and firm risk and finally the two- way relationship between capital structure and firm risk.

5.3.1 Justification for Using SEM

There are number reasons for using SEM in this study. First, SEM has numbers advantage over other models in estimating the relationships among the factors. SEM allows examination of complex relationships. Especially when the phenomena of interest are complex and multidimensional, SEM is the only analysis that permits complete and simultaneous tests of all the relationships. Second, regardless of the complexity, SEM takes into account the modelling of interactions, non-linearities, correlated independents, measurement error, correlated error terms, multiple latent independents measured by multiple indicators, and one or more latent dependent measured by multiple indicators. By using latent variable which is measured by multiple observed indicators, SEM extenuates reliability and validity problems. Whereas, using a single observed variable that assumes no measurement error is associated with the measurement of a variable. This ensures the ability of a measure to be consistent and accurately define the construct of the measures.

Data analyses by SEM involves three stages: data screening, confirmatory factor analysis (CFA) for latent variable and finally the path analysis of structural equation modelling (SEM). First, the data are tested for violations of statistical assumptions such as sample size, normality and multicollinearity. Second, confirmatory factor analysis was conducted for both exogenous and endogenous variables. The third and final step in SEM is to develop a complete path model and analysis the model. A path diagram is used to achieve this. In the complete path model, all latent variables are measured by multiple observed indicators which have associated error terms in addition to the residual error factor associated with the latent variable to determine if the proposed factor solution fits the data.

SEM begins with the specification of a model to be estimated. There are two types of models involved in specification of a model. The first step is known as measurement model which involves connecting a construct with all the observed variables that

measure the construct as shown in Figure 5.1. This procedure is known as confirmatory factor analysis.

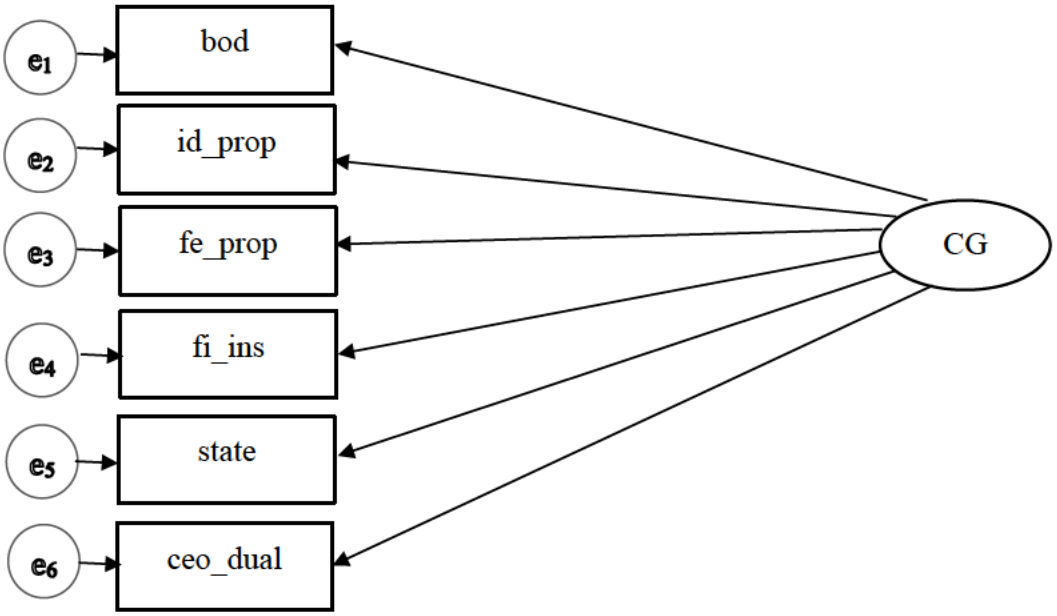

Figure 5.1: Measurement model for Corporate Governance construct using six observed variables

5.3.2 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) is done by assessing the factor loading of the variables to determine if the proposed factor solution fits the data. The procedure validates measurement model of a construct. CFA also assesses the validity and reliability of a construct. The validation of the construct must be conducted before modelling the causal-effect correlations between constructs can be established. CFA is conducted by modelling all the constructs of theoretical framework into a structural model to be analysed. Therefore, using Graphic User Interface (GUI) of STATA is the appropriate method to analyse and estimate the theoretical framework.

Through the CFA procedure, STATA will estimate the loading factor for each measured variable in the construct. The value of loading factor higher than 0.6 indicates that the measured variable is a meaningful to the measurement of the construct (Hair, et al., 2017). Item with loading factor less than 0.6 should be

eliminated one by one because the variable not only does not contribute in explaining the construct but also will affect the fitness indices.

The next step in CFA is to examine the fitness indices - Chi-square, indices of goodness-of-fit (GFI) and Root Mean Square Error of Approximation (RMSEA) test results. Acceptable value for each of the test differs from literature to literature. However, to test for an absolute fit for sample size larger than 200 Chi-square can be waived (Hair, et al., 2006). The other tests, GFI values greater than 0.90 for a basic model and 0.85 for a more complex model are considered good. RMSEA is another measure that corrects for the tendency of the measurement for goodness-of-fit and it represents how well a model fits a population and not just the sample used in this estimation. Lower RMSEA values indicate better fit which is typically less than 1.0 and the ideal value should be less than 0.8. To achieve a better goodness-of-fit of the CFA on the proposed construct, items are removed one by one starting from the lowest loading factor to model and achieve the desired value.

Subsequently, convergent validity of the constructs is validated in order to determine that all measurement is internally consistent, reliable and valid for further analysis (Byrne, 2012). STATA reports fitness indices, factor loading and R^2 value for each item and the correlation value between the constructs. The validity of the model can be interpreted from the results displayed on STATA GUI. Next, the composite reliability will be computed to verify the internal consistency of measurement scale. Construct reliability can be calculated as follows: square of the summation of the factor loading divide with square of the summation of the factor loading plus summation of standard error. Composite reliability considers the actual loading rather than assuming each factor is equally weighted.

5.3.3 Path Modelling

The concept of structural model is a statistical statement about the relations among the constructs. Once the model is specified, estimates of the free parameters from the set of data is obtained. A path model of the theoretical framework is built on the graphical user interface (GUI) STATA to test hypotheses.

Path modelling and analysis are done to analyse the relationship between endogenous and exogenous variables. The latent variables are developed by assigning weights to the indicators using path analysis which is run by STATA and assigned with the highest eigenvalue. Developed by geneticist Sewall Wright (1918), path analysis a diagram that also known as "causal modelling" that shows the independent, intermediate and dependent variables. It is a straightforward extension of multiple regression technique allows us to test theoretical propositions on cause and effect. Path analysis involves testing a theoretically or empirically determined specific pattern to decompose correlations into different interpretation of effects.

Typically path models are diagrams presented comprise of exogenous and endogenous variables connected by single and double-headed arrows. The arrows in the modelling show the assumed relations. The single-headed arrow points from cause to effect. A double-headed or curved arrow shows that the variables are correlated and no causal relations are assumed. The independent variables are called exogenous variables and the dependent variables are called endogenous variables. The path coefficient of one variable (the cause) to the other (the effect) indicates the direct effect of the cause to the effect. The key notations of the variables in the diagram are :-

X_n : observed/measured independent variables *

ξ : latent independent variables

η_n : latent dependent variables *

γ_n : indicators for the dependent variables *

e_n : residual error *

*n : sample/observed covariance matrix

The path coefficients are written with two subscripts with the effect being the first subscript followed by the causal. The simplest model posits a relationship between a single measured variable as presented in Figure 5.2. In the sample model shown below, the two measured variables appear in boxes connected by lines with arrows indicating that the independent variables (X_1, X_2) having direct relationship to the measured

dependent variable (η_1). Lines with two-headed arrows indicate the covariance among the independent variables. The residual indicates the unexplained portion of the ID.

In the sample model shown on Figure 5.2 below, the two exogenous variables (X_1 and X_2) are modelled as being correlated and as having both direct effects on Y_1. The regression model of the following path coefficient is as follows:

$$\eta_1 = \gamma_0 + \gamma_1 X_1 + \gamma_2 X_2 + e_1$$

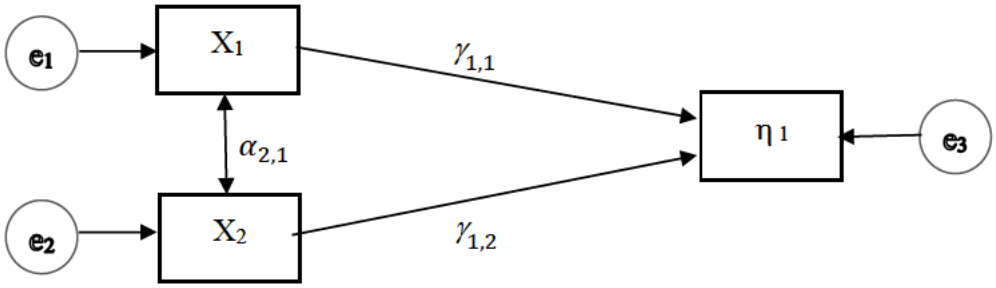

Figure 5.2: Path diagram of a multiple regression model

A more complex model appears in Figure 5.3. In this model, the dependent variables (ξ_1 and η_2) are latent variables. The dependent variables, ξ_1 is measured by X_3, X_4 and η_2 is predicted by X_5 and X_6. The model shows path diagram that X_1 and X_2 have direct effect to ξ_1 and indirect effect on η_2 translated from the following regression model:

$$\eta_2 = \gamma_0 + \emptyset_1 \xi_1 + \gamma_1 X_1 + \gamma_2 X_2 + e_1$$

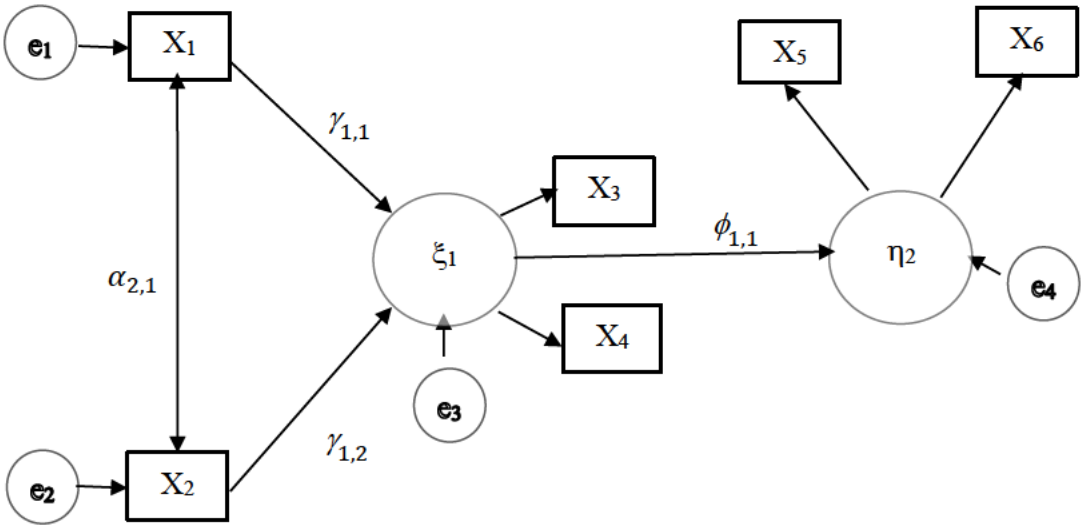

Figure 5.3: Path diagram of multiple regression model

5.3.4 Estimation and Model Fit

Once the relationship between the factors effecting capital structure and firm risk has been established, the next step will be to develop a complete structural equation model using GUI in STATA. The analysis was conducted by constraining 6 variables as the corporate governance (CG) factors, four relationship banking (BR) factors and the endogenous variable namely capital structure (CS) and unsystematic risk (UNSYS_RISK). The proposed structural model that incorporated the exogenous and endogenous variables (CG, BR, control variables, CS and UNSYS_RISK) is reported on Figure 5.4.

The structural model in Figure 5.4 shows the path diagram of the proposed Structural Equation Modelling

ξ_1 : The mediating role of Corporate Governance on Capital Structure

ξ_2 : The mediating role of Corporate Governance on Firm Risk

ξ_3 : The mediating role of Relationship Banking on Capital Structure

ξ_4 : The effect of Capital Structure on Firm Risk

ξ_5 : The effect of Firm Risk on Capital Structure

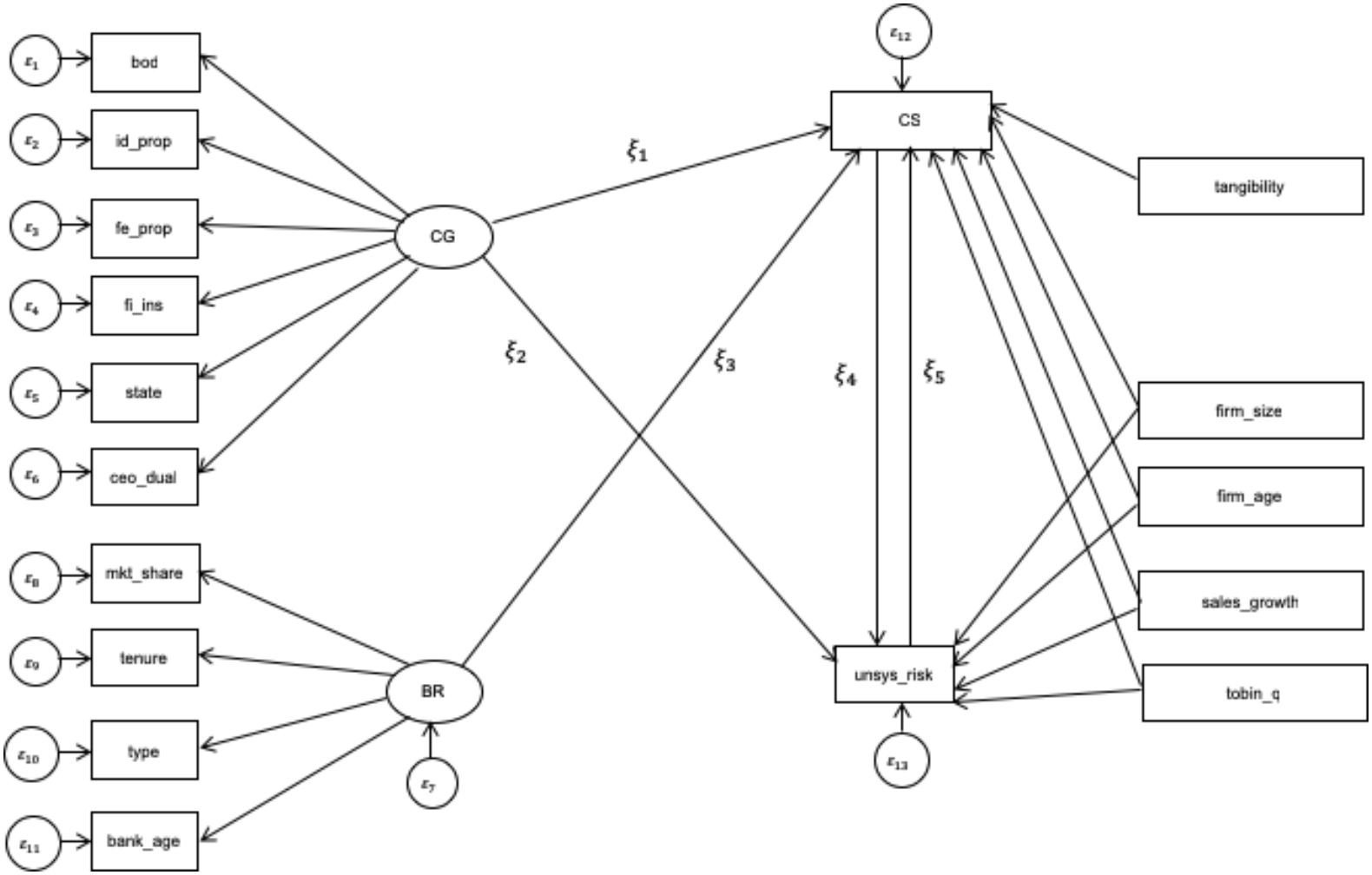

Figure 5.4: Structural Equation Path Modelling

5.4 Data

5.4.1 Data Description

In addition to the existing data from previous chapters, we obtain more data on bankers' relations. The data was obtained partly from Prowess and another part from Reserve Bank of India (RBI)[8]. Information on annual market share and ownership type of banks was obtained from RBI and firms' bankers information was obtained from Prowess. The information of bank's age was obtained from individual bank's website as this information was not available on either Prowess or RBI.

The final sample consists of unbalanced panel of 1,336 firms with 25,466 firm-years observations across 21 industries and 2 ownership types between 2008 and 2014. Group firms accounts for 62% (15,948 firm-years) of the total observations and non-group firms account for the balance 38% percentage (9,518 firm-years) of the observations. The breakdown of the final sample selection is simplified as follows:

Total manufacturing firms	2,434 firms
(Less) State (23) and Foreign-Owned firms (146)	2,265 firms
(Less) Firms with less than 5 years obs. (363)	1,902 firms
(Less) Firms with incomplete accounting data (128)	1,774 firms
(Less) Unavailability of complete stock prices (220)	1,554 firms
(Less) Unavailability of board of director (59)	1,495 firms
(Less) Unavailability of bankers' detail (159)	1,336 firms (25,466 obs.)

5.4.2 Variable Measurement

The variables use in this study are defined as follows;

Dependent Variables Definitions

Two dependent variables are used in this study. The unsystematic risk (UNSYS RISK) is measured with the annualized variance of residuals from the single

[8] https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications#!4

index model of market model (σe^2). The second dependent variable is the firms' capital structure (CS) measured as the book value of long-term debt over market value of total assets which is calculated as book value of total assets minus book value of equity plus market value of equity. This method of measurement is use following method widely used (Jong, Kabir, & Nguyen, 2007; Titman & Wessels, 1988).

Relationship Banking Variables

Banking specific variables are included in this modelling as a mediating factor that affects firms' risk.

- Market share (MKT_SHARE) – There is a strong relationship in the credit-to-deposit ratios of banks (Bhaumik & Piesse, 2006), indicating the lending volume will be high when deposit market share is high. Increase in banks' market share increases the banks' market concentration, an indication of market power of the bank. Market share is also an important strategic decisions that addresses bank stability issue (Berger & Bouwman, 2013). Thus, market share is an indicator of bank that is stable and are in healthy position to increase lending volume (Ariccia & Marquez, 2006).
- Length of relationship banking (TENURE) – banks develop close relationships with borrowers over time. The close relationship facilitates screening and monitoring of their borrowers (Ariccia & Marquez, 2006). Banks benefit from the screening and monitoring by elevating information asymmetry and use the information to perform multiple transactions rather than single transaction at arms-length.
- Bank ownership type (TYPE) – bank ownership type has a strong relationship with its lending behaviour. Evidence suggest that the level of risk averseness and interest rates differs across the different ownership types (Bhaumik & Piesse, 2006). Thus, bank ownership type has been included to describe relationship banking.
- Bank age (BANK_AGE) – bank's age has been previously shown to be an indicator of the bank's survival rate. Halling & Hayden, (2006) used bank age

as an explanatory variable when predicting bank failure. Thus, this study employs bank age as one of the factor that influence banking's lending behaviour.

Control variables

The modelling includes a number of firm specific control variables that are considered to affect either firm's capital structure, relationship banking, firm-risk or the measurement of risk which are similar to the previous chapters except for tangibility.

- Tangibility – The ratio of net fixed assets over book value of total assets. Tangible assets are likely to have an impact of a firm's borrowing decisions. Tangible assets are subject to less information asymmetries and have greater value than intangible assets. Harris & Raviv, 1991) predict that firm with tangible assets choose to have higher debt as the liquidation value is higher. Additionally, tangible assets are good collateral for loans. All these factors put together makes firms with greater tangible assets provides positive signal and attractive to creditors. However, firms with high tangible assets are claimed to be more likely to default. The intuition behind this theory is that firms with higher debt level and increased liquidation value makes liquidation the best strategy.

Table 5.1: Description of Variables
This table describes the variables in this study and the definitions of the variables

Variables	Definitions
UNSYS RISK	Unsystematic risk is the residual of single-index market model (Sharpe, 1963) decomposed from total risk.
CS	Book value of long-term debt over market value of total assets which is calculated as book value of total assets minus book value of equity plus market value of equity
BOD	Total number of executives in board of directors
ID_PROP	Proportion of independent directors within the board of directors
FE_PROP	Proportion of female directors within the board of directors
FI_INS	Representatives of financial institute on board of directors
STATE	Representatives of financial institute on board of directors
CEO_DUAL	Dummy variable: 1 if CEO of the firm is also the Chair of Board of Directors; 0 otherwise
MKT_SHARE	Percentage of deposits held by banks against total deposit of other banks in the year
TENURE	Length of relationship banking between firms and individual bank
TYPE	Ownership type of the banks
BANK_AGE	Age since the incorporation of the bank
SIZE	Natural log of one year lagged total assets - Ln(Total Assets t-1)
AGE	One year lagged of years since firm incorporation
SALES_GRW	(Sales t - Sales t-1/Sales t-1)
TOB-Q	(Market Value / Book Value) t-1
TANGIBILITY	The ratio of net fixed assets over book value of total assets

5.5 Statistical Analysis

This section presents the preliminary data analysis and the findings of the research. As discussed in section 5.3.1, the analysis begins with the testing of any violations in statistical assumptions followed by confirmatory factor analysis and finally the path analysis in conducted using the structural equation modelling.

5.5.1 Descriptive Analysis

Prior to testing the hypotheses, there is a need to verify the data meet the statistical assumptions. All the variables used in this measurement were first examined through descriptive analysis to describe the characteristics of the variables used. Table 5.2 reports the summary statistics of the dependent, independent and control variables. The results are shown for overall sample and for group and non-group firms.

The descriptive statistics show that firms group firms have lower mean of unsystematic risk compared to non-group firms. The mean of capital structure, i.e. the ratio of debt and equity, is almost equal for both type of firms. Group firms, on average, have larger board size (11) compared to non-group firms (9.5). Meanwhile, the rest of the board characteristics are almost equal for both types of firms.

As for relationship banking (BR), there are no significant difference in all of the variables analysed suggesting relationship banking are equal between group and non-group firms. Control variables describes the characteristics of the firms. On average, group firms are larger and older than non-group firms. Higher Tobin's Q of group firms indicates group firms have higher growth opportunity compared to non-group firms. Non-group firms have more tangible assets compared to group firm.

Table 5.2: Mean and Median of Dependent, Independent and Control Variables

This table reports the descriptive statistics of all the variables for total sample, group and non-group firms.

	TOTAL SAMPLE					GROUP					NON-GROUP				
	N	**Min**	**Mean**	**Median**	**Max**	**N**	**Min**	**Mean**	**Median**	**Max**	**N**	**Min**	**Mean**	**Median**	**Max**
Dependent Variables															
UNSYS RISK	25466	2.294	9.640	8.954	42.557	15948	2.294	8.894	8.053	34.250	9518	2.294	10.890	10.584	42.557
CS	25466	0.000	1.526	1.225	5.998	15948	0.000	1.459	1.176	5.998	9518	0.000	1.637	1.331	5.902
CG Variables															
BOD	25466	1.000	10.429	10.000	21.000	15948	1.000	10.990	11.000	21.000	9518	1.000	9.486	9.000	21.000
ID_PROP	25466	0.000	0.485	0.500	1.000	15948	0.000	0.490	0.500	1.000	9518	0.000	0.475	0.500	1.000
FE_PROP	25466	0.000	0.118	0.000	3.000	15948	0.000	0.110	0.000	1.000	9518	0.000	0.131	0.000	3.000
FI_INS	25210	0.000	0.175	0.000	1.000	15844	0.000	0.210	0.000	1.000	9366	0.000	0.115	0.000	1.000
STATE	25466	0.000	0.032	0.000	1.000	15948	0.000	0.043	0.000	1.000	9518	0.000	0.015	0.000	1.000
CEO_DUAL	25466	0.000	0.942	1.000	1.000	15948	0.000	0.964	1.000	1.000	9518	0.000	0.906	1.000	1.000
BR Variables															
MKT_SHARE	25466	0.000	4.407	2.860	18.260	15948	0.000	4.218	2.770	18.260	9518	0.000	4.724	2.980	18.260
TENURE	25466	3.000	8.325	9.000	18.000	15948	3.000	8.422	9.000	18.000	9518	3.000	8.163	9.000	18.000
TYPE	25466	1.000	1.815	2.000	4.000	15948	1.000	1.818	2.000	4.000	9518	1.000	1.809	2.000	4.000
BANK_AGE	25466	12.000	103.008	99.000	328.000	15948	14.000	101.553	99.000	328.000	9518	12.000	105.496	99.000	328.000
Control Variables															
SIZE	25466	-0.344	5.305	5.235	7.970	15948	-0.344	5.682	5.679	7.970	9518	-0.344	4.674	4.587	7.970
AGE	25466	10.000	37.082	31.000	106.000	15948	10.000	41.018	34.000	106.000	9518	10.000	30.486	27.000	106.000
SALES_GRW	25466	-0.543	0.188	0.133	2.504	15948	-0.543	0.162	0.124	2.504	9518	-0.543	0.232	0.419	2.504
TOB-Q	25466	-6.590	1.701	1.052	14.189	15948	-6.590	1.820	1.111	14.189	9518	-6.590	1.501	0.975	14.189
TANGIBILITY	25466	0.000	3.305	1.637	17.991	15948	0.000	2.517	0.950	17.991	9518	0.000	4.626	3.269	17.963

Following this, in Table 5.3the annual capital structure by quartile is reported. The table shows both type of firms have similar debt equity ratio pattern throughout the sample period. The capital structure is on increasing trend throughout the quartile and is at the highest at the end of the year. Subsequently, Table 5.4, unsystematic risk of firm is tabled against capital structure by quartile. The table concede with the result on Table 5.3 as unsystematic risk moves in the same direction as capital structure suggesting positive relationship between firm risk and capital structure.

Table 5.3: Annual Capital Structure Comparison Between Group and Non-Group by Quartile
This table presents annual capital structure of group and non-group firm by quartile.

	CS_Q1		CS_Q2		CS_Q3		CS_Q4	
	Group	Non-Group	Group	Non-Group	Group	Non-Group	Group	Non-Group
2008	0.615	0.621	1.224	1.224	2.060	2.011	5.465	5.290
2009	0.624	0.611	1.219	1.209	2.037	2.042	5.690	5.460
2010	0.598	0.594	1.193	1.213	2.056	2.024	5.951	5.800
2011	0.612	0.618	1.209	1.178	2.060	2.020	5.985	5.680
2012	0.608	0.597	1.225	1.216	2.039	2.007	5.994	5.411
2013	0.614	0.607	1.224	1.204	1.983	2.063	5.836	5.823
2014	0.618	0.626	1.222	1.222	2.049	2.051	5.576	5.877
Total	**0.618**	0.618	**1.222**	1.217	**2.054**	2.042	**5.892**	5.800

Table 5.4: Unsystematic Risk Comparison Between Group and Non-Group by Capital Structure Quartile
This table presents annual capital structure of group and non-group firm by quartile.

	Total	Group	Non-Group
	Unsys_Risk		
CS_Q1	20.959	20.493	21.267
CS_Q2	22.007	21.548	25.060
CS_Q3	23.031	22.113	23.390
CS_Q4	24.808	24.079	24.955

5.5.2 Univariate Analysis

Table 5.5 reports the equality tests across group and non-group firms samples. t-statistics test was employed to tests for equality of means and Wilcoxon Mann–Whitney tests to test for equality of medians. Both tests reveal that group and non-group firms are significantly different.

Table 5.5: Equality of Mean and Median of Control Variables
This table reports the univariate analysis of annual equality of mean and median between group and non-group firm of all the variables. The difference-in-mean t-test assume unequal univariate analysis of annual equality of mean and median of all the independent variables. ***, ** and * indicate the that group firms are either higher (+ sign) or lower (- sign) than non-group firms at 1%, 5% and 10% significance level respectively.

	N	Mean Test	Median Test
Dependent Variables			
UNSYS RISK	25466	-1.997***	-32.939***
CS	25466	-0.178***	-11.793**
CG Variables			
BOD	25466	1.505***	39.352***
ID_PROP	25466	0.015***	9.350***
FE_PROP	25466	-0.021***	-7.545***
FI_INS	25210	0.095***	19.381***
STATE	25466	0.028***	12.088***
CEO_DUAL	25466	0.057***	18.970***
BR Variables			
MKT_SHARE	25466	-0.506***	-6.583***
TENURE	25466	0.259***	17.308***
TYPE	25466	0.009	1.048***
BANK_AGE	25466	-3.974***	-4.238***
Control Variables			
SIZE	25466	1.008***	56.434***
AGE	25466	10.531***	49.057***
SALES_GRW	25466	-0.070***	-12.438***
TOB-Q	25466	0.318***	13.501***
TANGIBILITY	25466	-2.109***	-47.358***

5.5.3 Normality Test

The check the fitness of the data before proceeding to multivariate analysis. It is a basic assumption in multivariate analysis that a significant deviation from normality will result in an invalid statistical outcome (Hair et al., 2006). The variables are tested for normality using the common statistical normality tests by assessing levels of skewness and kurtosis. Skewness will identify the symmetry of the distribution (Hair, et al., 2006) and kurtosis will identify the peakedness or flatness of the distribution relative to the normal distribution.

The possibility of the tendencies of skewness and kurtosis being sensitive to a large set of data and often display considerable deviation from normality, the normal distribution of the data is also observed with histogram and graphs show that the data are normally distributed as confirmed by Table 5.6. The table shows the result of normality test that has been executed on dependent, independent variables and control variables of this study. The skewness and kurtosis ranges below the suggested range of $\pm$ 2.58 for 1% significance and $\pm$ 1.96 for 5% significance level (Hair et al., 2006) to show that the data for this study is normally distributed.

Table 5.6: Normality Analysis
This table reports the skewness and kurtosis of all the variables in this study

	N	Skewness	Kurtosis
Dependent Variables			
UNSYS RISK	25466	0.015	0.256
CS	25466	0.001	0.152
CG Variables			
BOD	25466	0.035	0.020
ID_PROP	25466	0.015	0.578
FE_PROP	25466	0.084	0.369
FI_INS	25210	0.000	0.201
STATE	25466	0.000	0.010
CEO_DUAL	25466	0.005	0.086
BR Variables			
MKT_SHARE	25466	0.115	0.394
TENURE	25466	0.004	0.258
TYPE	25466	0.009	0.142
BANK_AGE	25466	0.050	0.153
Control Variables			
SIZE	25466	0.499	1.582
AGE	25466	0.000	0.257
SALES_GRW	25466	0.059	0.891
TOB-Q	25466	0.016	0.255
TANGIBILITY	25466	0.045	0.345

5.5.4 Multicollinearity Analysis

To test if the independent variables in this study are highly correlated, multicollinearity test was conducted. The most common measure for assessing multicollinearity are Variance Inflation Factor (VIF) and Tolerance value (the inverse of VIF, 1/VIF). The acceptance value for VIF is 10 and the tolerance value has a cut-off threshold of 0.10.

5.5.5 Correlation Analysis

In order to understand the causal relationship among variables and ultimately improve the ability to predict the hypotheses, correlation analysis using bivariate Pearson correlation coefficient matrix. The correlation measures the relatedness of the variables and has a range of possible values from +1 to -1.

Table 5.7 shows the results of multicollinearity analysis and the correlation analysis of the all the variables. The results in the first 4 columns show that VIF values for all the variables against the two dependent variables. The values are between 1.05 and 2.09 are within acceptable level of 10. Meanwhile, the tolerance value (1/VIF) are also above the acceptance level of 0.10. Hence, it is concluded that there is no multicollinearity problem among the dependent, independent and the control variables.

The Pearson correlation coefficients between the variables are reported from column 5 onwards. The finding suggests that at significant level of 1%, unsystematic risk (UNSYS_RISK) is significantly correlated to all the variables except to proportion of female directors (FE_PROP). The other dependent variable, capital structure (CS), is significantly related to most of the variables at 1%, MKT_SHARE at 5% and uncorrelated to TENURE, BOD, ID_PROP and FE_PROP.

Table 5.7: Pearson Correlation Coefficients Matrix

This table presents the Pearson correlation coefficients matrix of dependent, independent and control variables. ***, **, * denotes the significant level of 1%, 5% and 10% level of significant respectively.

	VIF	1/VIF	VIF	1/VIF	UNSYS RISK	CS	BOD	ID_PROP	FE_PROP	FI_INS	STATE	CEO_DUAL	MKT_SHARE	TENURE	TYPE	BANK_AGE	SIZE	SALES_GRW	AGE	TOB_Q
UNSYS RISK	-	-	1.27	0.79																
CS	1.15	0.87	-	-	0.195***															
BOD	1.35	0.74	1.35	0.74	-0.241***	0.006														
ID_PROP	1.07	0.94	1.07	0.94	-0.077***	-0.010	0.033***													
FE_PROP	1.05	0.95	1.05	0.95	-0.001	-0.011	-0.031***	-0.198***												
FI_INS	1.16	0.86	1.14	0.87	0.030***	0.224***	0.212***	-0.18**	0.015*											
STATE	1.05	0.95	1.05	0.95	-0.004	0.059**	0.167***	-0.016*	0.025***	0.119***										
CEO_DUAL	1.07	0.934	1.05	0.95	-0.100***	-0.143***	0.160***	0.016**	0.008	-0.058***	-0.058***									
MKT_SHARE	1.62	0.62	1.62	0.62	0.079***	-0.014*	-0.051***	-0.011	0.002	-0.008	-0.007	0.000								
TENURE	1.05	0.96	1.05	0.95	0.071***	-0.008	0.052***	0.014*	-0.027***	0.053***	0.032***	0.052***	0.145***							
TYPE	1.18	0.85	1.18	0.85	0.045***	0.077***	0.000	0.013*	-0.003	0.059***	0.033***	-0.011	0.128***	0.052***						
BANK_AGE	1.07	0.94	1.79	0.56	0.031***	-0.024***	-0.013*	0.003	-0.014*	-0.012	-0.007	0.002	0.597***	0.121***	0.360***					
SIZE	1.91	0.52	2.09	0.48	-0.399***	0.114***	0.426***	0.042***	-0.007	0.238***	0.026***	0.077***	-0.132***	-0.017**	0.016**	-0.043***				
SALES_GRW	1.05	0.96	1.06	0.95	-0.110***	-0.071***	0.120***	0.099***	-0.043***	-0.004	-0.014*	0.053***	-0.015*	0.077***	-0.013*	0.003	0.077***			
AGE	1.06	0.95	1.07	0.94	0.066***	0.068***	0.015*	-0.068***	0.004	0.029***	-0.005	-0.063***	0.003	-0.029***	0.005	0.004	0.079***	-0.125***		
TOB_Q	1.11	0.902	1.1	0.91	-0.169***	-0.151***	0.170***	-0.001	0.030***	-0.064***	-0.005	0.073***	-0.024***	0.048****	-0.054***	0.025***	0.155***	0.080***	0.103***	
TANGIBILITY	1.72	0.58	1.67	0.60	0.245***	-0.194***	-0.295***	-0.053***	0.039***	-0.191***	-0.015*	-0.099***	0.094***	-0.008	-0.001	0.041***	-0.627***	-0.086***	-0.037***	-0.072***

5.5.6 Confirmatory Factor Analysis (CFA)

Before proceeding to test the hypothesised model, CFA is conducted to verify the validity and reliability of the measures. This step is necessary to appraise a sound measurement and reduce measurement errors. The latent variables in this study (CG & BR) were measured with multiple observed variables, hence there is a need to check the degree to which the specific measurement represents the latent variable (Cronbach, 1988). The confirmatory measurement assessment, confirmatory factor analysis (CFA), analyses the 2 latent (exogenous) variables namely corporate governance (CG) and banking relation (BR) are conducted to evaluate the goodness-of-fit of the measured variable to estimate the latent variables.

Latent Variable 1: Corporate Governance (CG)

Confirmatory Factor Analysis (CFA) of SEM using GUI STATA was conducted using the six (6) measured variables board size (BOD), proportion of independent directors (ID_PROP), proportion of female directors (FE_PROP), financial institute nominees (FI_INS), state nominees (STATE) and CEO duality (CEO_DUAL). Table 5.8presents the goodness-of-fit for corporate governance characteristics. The overall loading factor with the exception of STATE are well above the recommended value of 0.6 (Hair et al., 2017) and can be used in the structural model. Hence, during the fitting of the model, STATE will be removed from the measurement model in order to achieve convergent.

Table 5.8: Goodness-of-fit of Corporate Governance
This table reports goodness-of-fit of the measured variable used to estimate the latent variable corporate governance (CG)

Latent Variable 1: CG	Measured Variable	Factor Loading	Standard Error	Significant Level
Corporate Governance (CG)	BOD	0.97	0.027	***
	ID_PROP	0.83	0.033	***
	FE_PROP	0.93	0.052	**
	FI_INS	0.88	0.078	**
	STATE	0.51	0.041	
	CEO_DUAL	0.98	0.009	***

Latent Variable 2: Relationship Banking (BR)

Confirmatory Factor Analysis (CFA) of SEM using GUI STATA was conducted using the four (4) measured variables; bankers market share (MKT_SHARE), length of relationship banking (TENURE), type of bank ownership (TYPE) and age of banks (AGE).

Table 5.9 presents the goodness-of-fit for the relationship banking characteristics. The overall loading factor of MKT_SHARE and TENURE are above 0.6 and are determined to correctly measure the latent variable BR. However, the measured variable TYPE and BANK_AGE does not meet the criteria to be a right measurement for latent variable BR. Hence, during the fitting of the model, BANK_AGE will be removed first followed by TYPE (if necessary, as TYPE is border lining the cut-off value of 0.6) from the measurement model first in order to achieve convergent.

Table 5.9: Goodness-of-fit of Relationship Banking
This table reports goodness-of-fit of the measured variable used to estimate the latent variable relationship banking (BR)

Latent Variable 2: BR	Measured Variable	Factor Loading	Standard Error	Significant Level
Banking Relation (BR)	MKT_SHARE	0.99	0.04	***
	TENURE	0.71	0.01	***
	TYPE	0.32	0.67	
	BANK_AGE	0.59	0.51	*

5.5.7 Composite Reliability

In determining the internal consistency reliability for the measurement models, composite reliability was calculated using Cronbach Coefficient Alpha. Through composite reliability, it can be determine if the measured variables used measure a single concept and the measured variables are internally consistent (Hair et al., 2017). Hair et al., (2017) suggest that an acceptable level of coefficient alpha to retain a measured variable is at least 0.7 and lower than 0.9. As shown in Table 5.10, the composite reliability for corporate governance is 0.813 and relationship banking shows a composite reliability of 0.917, which are well within the suggested acceptance level and have a reasonable internal consistency.

Table 5.10: Composite Reliability
This table presents the composite reliability for each variable in this study

Variable	Measured Variable	Factor Loading	Composite Reliabity
Corporate Governance (CG)	BOD	0.97	0.813
	ID_PROP	0.83	
	FE_PROP	0.93	
	FI_INS	0.88	
	STATE	0.51	
	CEO_DUAL	0.98	
Banking Relations (BR)	MKT_SHARE	0.99	0.917
	TENURE	0.71	
	TYPE	0.63	
	BANK_AGE	0.32	

5.5.8 Structural Equation Modelling (SEM)

Hypothesized SEM

The hypothesized structural model as shown in Table 5.11 were tested to estimate the overall model fit. The loading factor of one measured variable of each latent variable will be fixed to 1 to generate a scale for the latent variable. STATA will automatically choose the first variable in the model, however, this can be changed manually if otherwise preferred. Fit indices discussed in section 5.3.2 are utilised to assess the measurement model to test the hypothesized model.

The overall fit of the hypothesized model shown Table 5.11. Even though the chi-square is significant, the p-value of 0.0001, GFI of 0.682 and RMSEA of 0.109 do not meet the fit indices benchmark. The preferred threshold for GFI and CFI is below 0.90 and RMSEA should be below the cut-off value of 0.08. Hence, the hypothesized model is not accepted, and the structural model needs to be revised.

Table 5.11: The Overall Fit of the Hypothesized Structural Model
This table presents the overall fit of the hypothesized structural model

Fit Indices	χ^2	χ^2/df	P	GFI	CFI	RMSEA
Structural Model	3926.486	59.492	0.0001	0.682	0.856	0.109

Final Respecified SEM

In obtaining the best fit model, the structural model has to be respecified following the assessment of the goodness-of-fit indices. SEM has eliminated two observed variables, state and bank age. With the modifications of the hypothesized model, a new revised structural model is presented in Table 5.12. Meanwhile, in Figure 5.5, the overall fit for the respecified and final structural model is presented. The same set of indices utilised to assess the hypothesized model.

The results suggest the respecified structural model is a good fit. The ratio of chi-square and degree of freedom is not below the acceptance level of 3. However, this can be ignored as was discussed previously in Section 5.3.2 the chi-square value is insignificant for large sample model. However, it is advised to evaluate a model based on more than a single index (Hair et al., 2017). Accordingly, the rest of the fitness indices indicates the new model fits into desirable range. GFI & CFI fit into the preferred threshold for GFI and CFI which is above 0.90 and RMSEA of 0.039 which is below the cut-off value of 0.08.

Table 5.12: The Overall Fit of the Revised Structural Model
This table presents the overall fit of the revised structural model

Fit Indices	χ^2	χ^2/df	P	GFI	CFI	RMSEA
Structural Model	2710.66	16.771	0.079	0.978	0.914	0.039

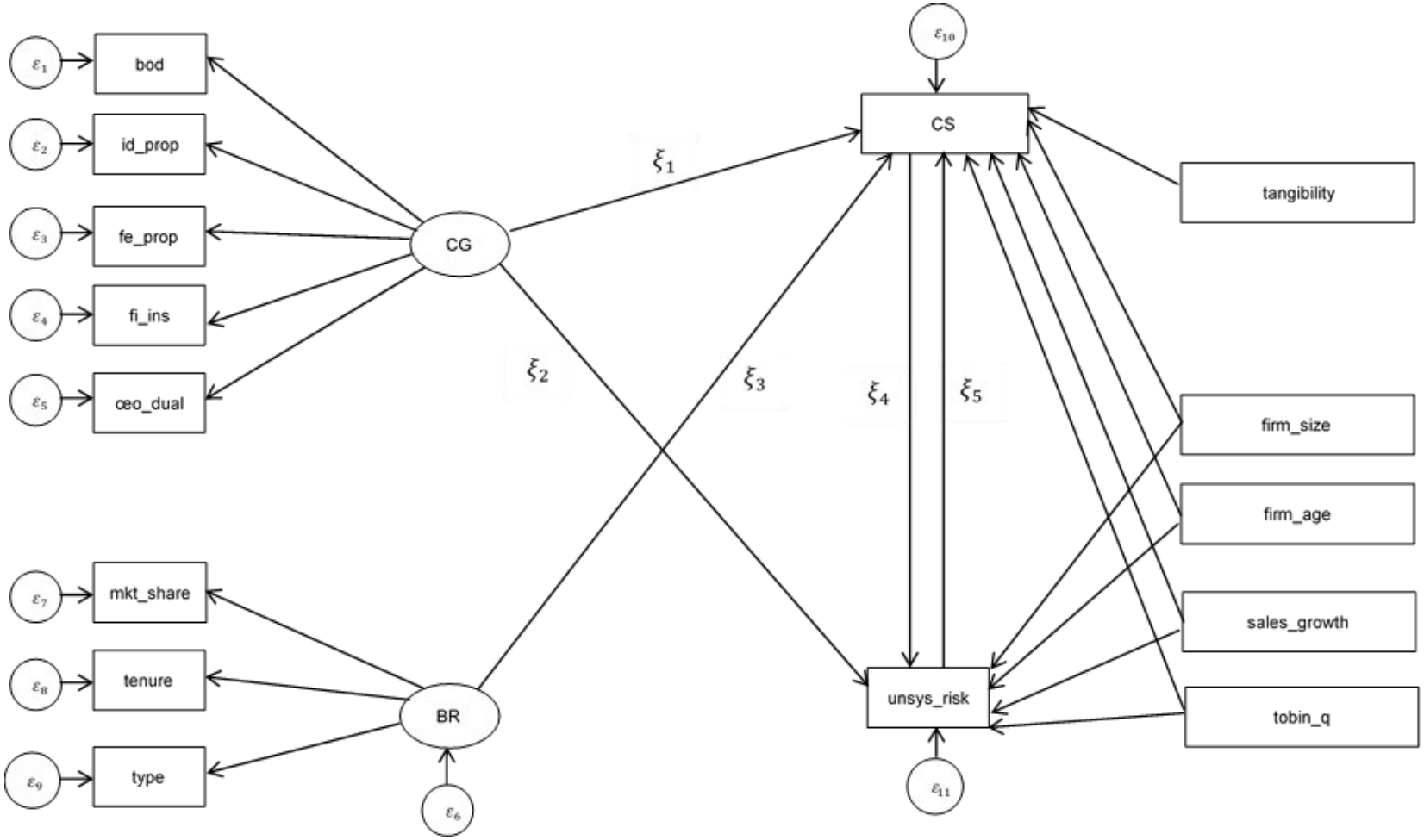

Figure 5.5: Respecified Structural Equation Modelling

5.6 Result and Discussion

The two-way relationship between capital structure and firm risk as mediated by corporate governance and relationship banking were simultaneously examined as illustrated in Figure 5.6. The figure reports the findings on the finalised structural model by integrating the observed and latent variables for year 2008 to 2014 for all firms, i.e. business group affiliated firms and non-group firms are reported. The figure reports the outcome of the conceptual framework equation modelling of hypotheses discussed in Section 5.2. The overall final structure model and model fit are reported in Table 5.12. The results show that all the paths are significant at a minimum of 10% significance. The results for all firms indicate that corporate governance, relationship banking and capital structure jointly describe 56% variance of firm risk and capital structure's variance of 68% is jointly explained by corporate governance and firm risk. Both corporate governance and relationship banking are found to be mediating the firm's capital structure and firm risk at a significant level.

Figure 5.7 reports the SEM model for group affiliated firms. The results are quite identical to all firms except that now latent variable corporate governance have negative correlation for firm risk, even though this is not statistically significant. The results for all firms indicate that corporate governance, relationship banking and capital structure jointly describe 61% variance of firm risk and capital structure's variance of 81% is jointly explained by corporate governance and capital structure.

Figure 5.8 reports the SEM model for non-group firms. The results for all firms indicate that corporate governance, relationship banking and capital structure jointly describe 81% variance of firm risk and capital structure's variance of 65% is jointly explained by corporate governance and capital structure. All the correlations are significant at a minimum of 10%.

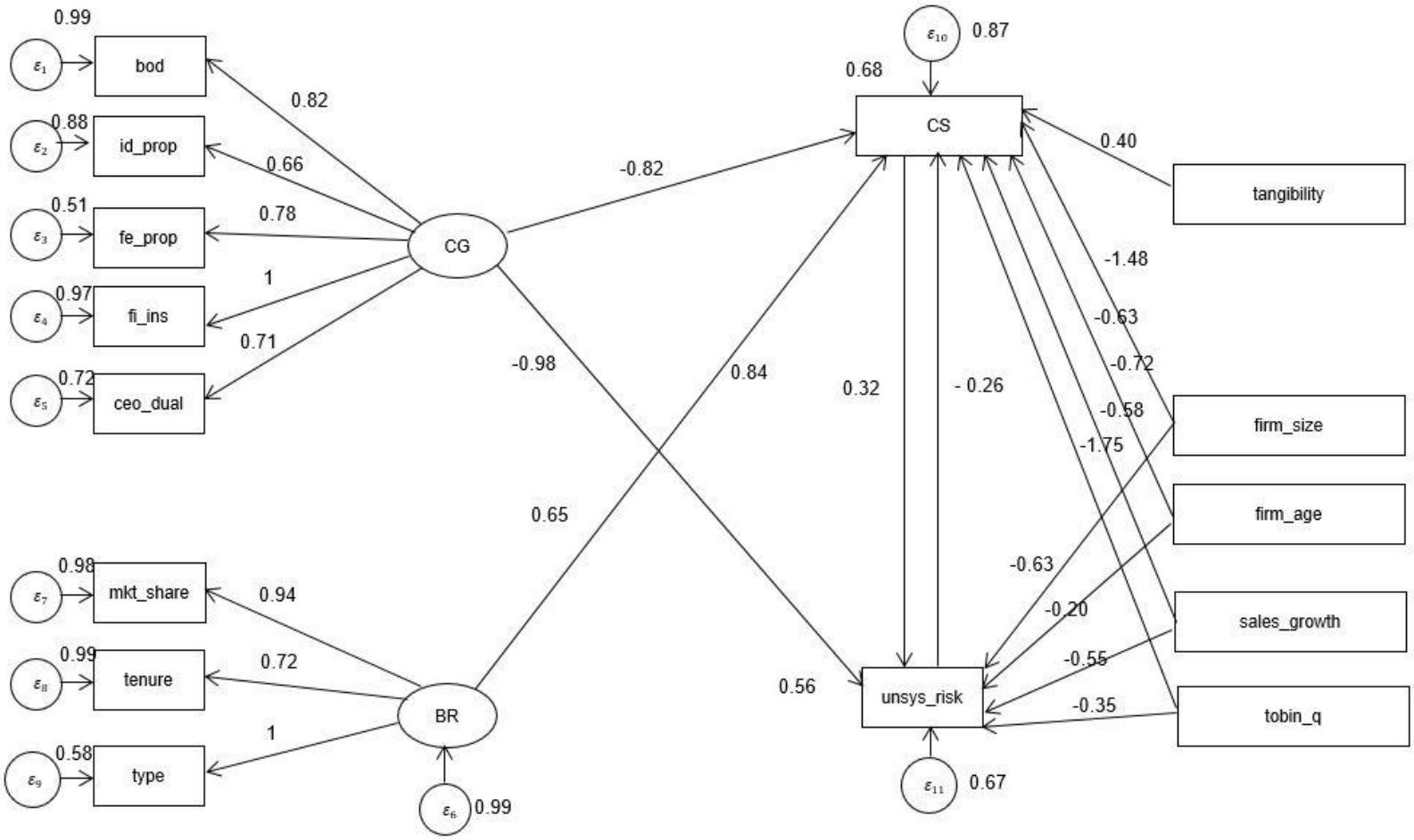

Figure 5.6: Final Structural Equation Modelling for Overall Sample

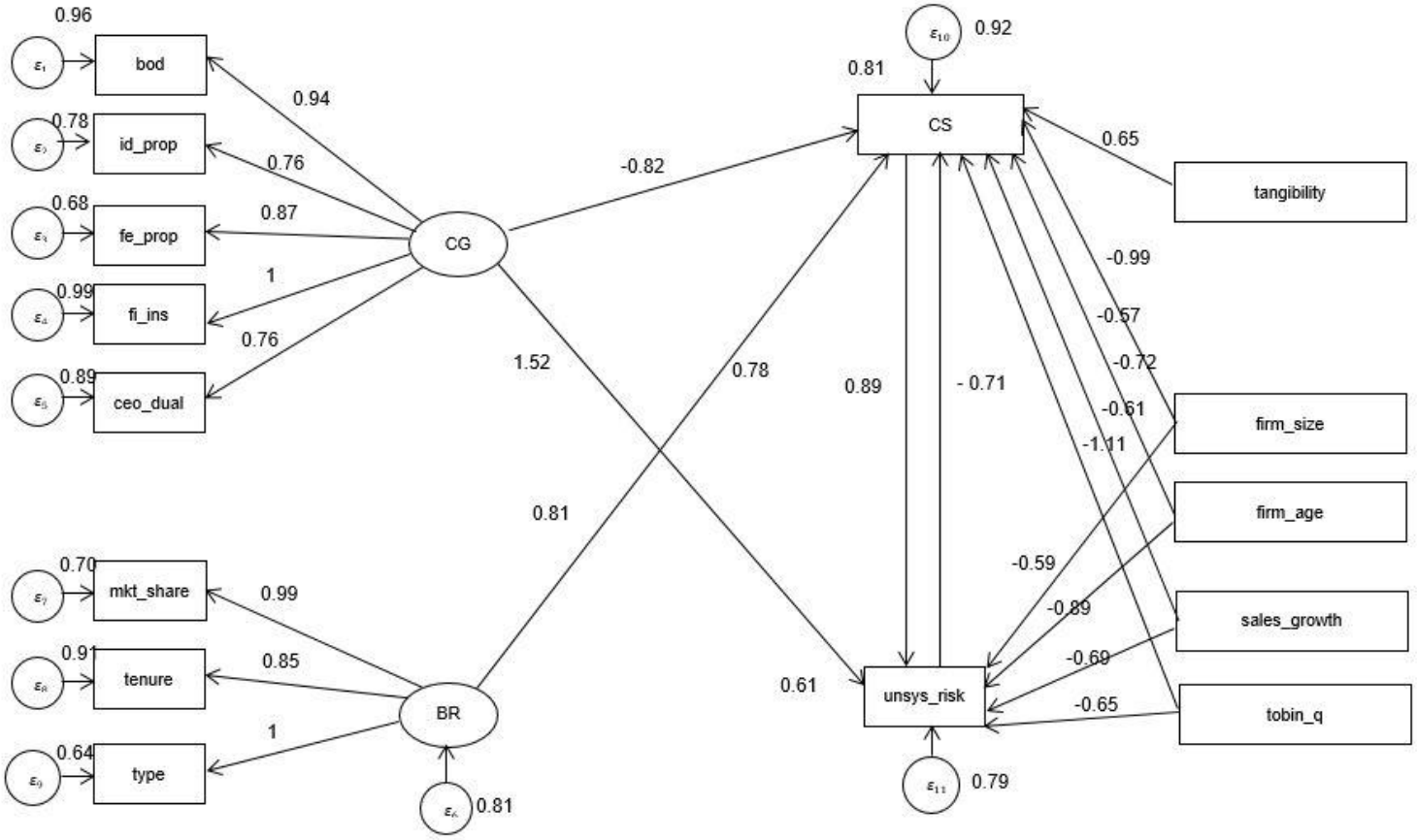

Figure 5.7: Final Structural Equation Modelling for Group Affiliated Firms

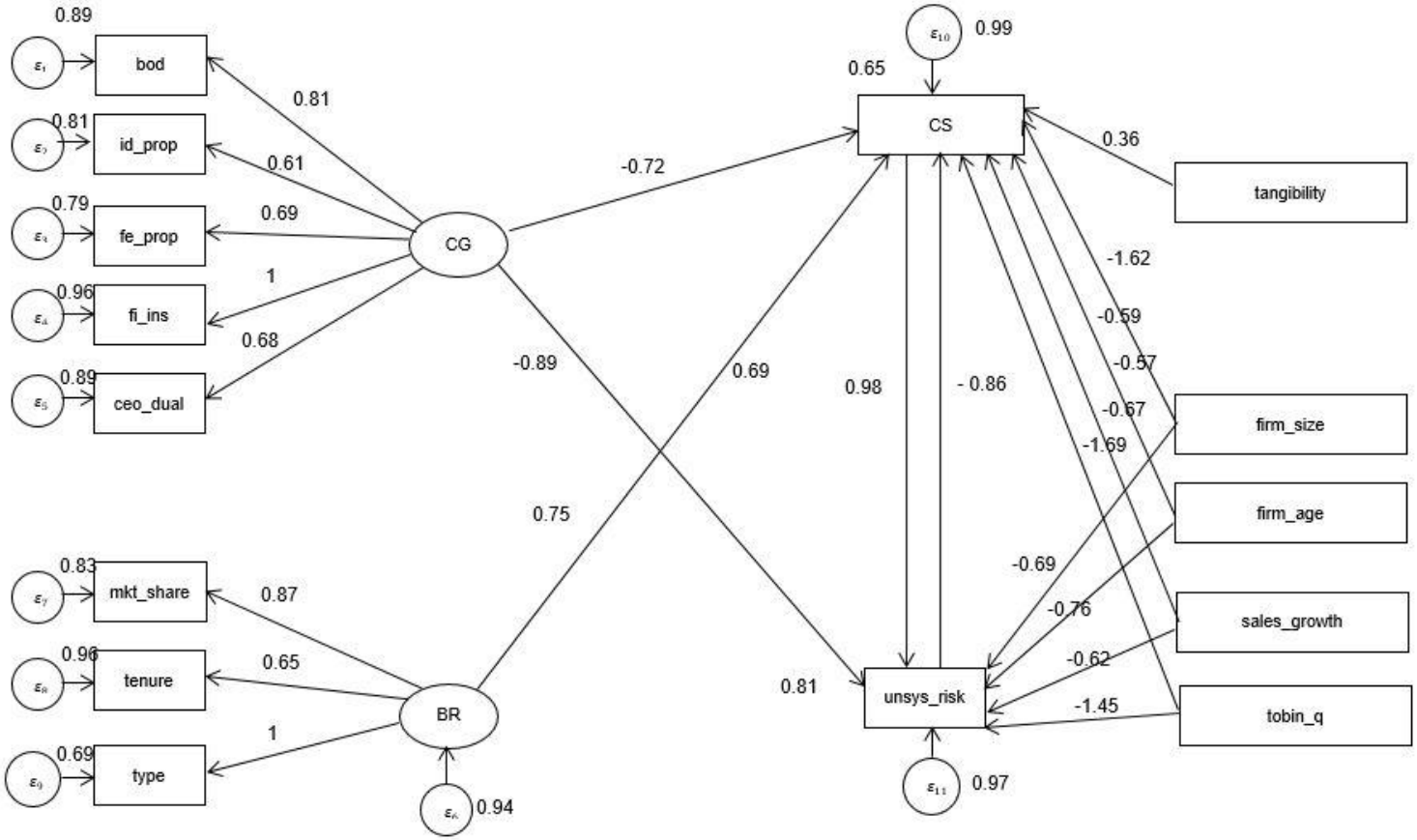

Figure 5.8: Final Structural Equation Modelling for Non-Group Firms

5.7 Conclusion

The objective of this study is to develop a structural equation model to understand an important yet unexplored two-way relationship between firm capital structure and unsystematic risk. The study also explored the difference in the two-way relationship between group and non-group firms. Prior to analysing the two-way relationship, the study also investigated the mediating role of corporate governance mechanisms and relationship banking in determining the capital structure choices.

First, based on the evidence obtained, it appears that on average, both group and non-group firms have similar of capital structure ratio. One type of firm does not appear to prefer debt over equity more than the other despite business group having the advantage of internal capital market. Second, the structural equation modelling shows that the two-way relationship between firms' unsystematic risk and capital structure choices for both types of firms. This is particularly intriguing when group firms have exclusive access to internal capital markets and theoretically would prefer internal funding. Likewise, group affiliate with pyramidal ownership structures have often been suspected of tunnelling and diversifying resources.

In the previous study, it was shown that corporate governance at firm level in the emerging economy is effective in influencing firm risk. The different elements of corporate governance were demonstrated to have influenced firm-risk differently depending on the motives of the board representative. Similarly, in this study it is hypothesised that corporate governance mechanism is an effective tool to discipline controlling shareholders from expropriating minority shareholders by undertaking optimal capital structure choices. To incorporate this, the latent variable corporate governance is included as a mediator on both capital structure and firm risk.

Addressing the notion that high information asymmetry problems within firms with high ownership concentration motivated the inclusion of relationship banking as another mediating latent variable that can further improve firm transparency and consequently influences capital structure and firm risk. The findings show that long

term relationship between banks and customers, the banks' stability and bank type influence both capital structure and firm risk of group and non—group equally.

It is concluded that the capital structure and firm risk of both group affiliates and non-group firms are interlinked to one another. In the context of agency theory, both type of firms are highly incentivised to manage risk at firm level to avoid bankruptcy and also attain optimal capital structure to be able particular investment strategy, Hence, the findings suggest that both firms are likely pursuing corporate strategy that seeks to reduce the likelihood of bankruptcy either by adjusting its capital structure or by adjusting the risk it bears (Castanias, 1983) simultaneously. This approach towards risk management by firms shed lights on the understanding of decisions making and explore the risk-taking pattern at firm level.

CHAPTER SIX :
CONCLUSION

The overall aim of this thesis is to investigate risk-taking behaviour of business group affiliated firms in emerging economies in comparison to non-group firms. The effects of ownership structure, corporate governance and capital structure on group affiliated firms' risk were examined in individual study respectively. The following section summarises the conclusion of each study:-

6.1 On Internal Capital Markets

The aim of the first empirical chapter of this thesis is to examine the impact of a firm's organizational form on its risk level and improve our understanding of how internal capital markets of business group affiliated firms affects this risk level. On the basis of a detailed survey of the literature, it was evident that (1) both business group affiliated firms and non-group firms suffer from similar type of agency problems with high level ownership concentration (2)business groups consists of widely diversified firms and the group affiliated firm benefits from internal markets that enable resources reallocation to assist other financially distressed affiliated firms. Taking into account these findings, this study examines the difference in firm risk of group and non-groups firms to identify if group affiliated firms can manage risk using co-insurance effect and facilitates risk sharing across the group.

The findings of this study highlights that despite having similar ownership structure, group affiliated firms and non-group firms have distinguishable firm risk-taking behaviour. In particular, the study examined whether the exhibition of lower firm risk of business group affiliated firms is due to co-insurance effect of group firms. It is argued that certain firms within the group have the necessity to provide co-insurance to the group as a whole. The results suggest that individual group affiliated firms' risk-taking behaviour is dependent to the firms' contribution towards groups' overall size, revenue and cash flow. The argument on co-insurance effect of group affiliated firm is further confirmed by modelling it into behavioural finance framework and analyse firm risk of firms facing financial distress. The results show that firms that are

financially safe assumes lower risk than the firms that are financially distressed. Firms that are financially safe and deliberately assumed lesser risk are in the position to act as a safety net for other affiliates. In summary, group affiliate firms' lower unsystematic risk is attributed to the co-insurance effect that not only allows resource reallocation but also to ensure survival of group affiliates in the group.

The findings of this study significantly extend the literature on emerging market firms, by first, providing understanding on risk by extending the line of inquiry about the impact of organizational form on firm risk-taking. Specifically, the study provides better understanding of the attribute of business groups - internal capital market affects firm risk. Second, the findings contribute to the growing literature on business groups by focusing on the less discussed issue of the impact of the incentives associated with the business group structure on corporate strategy, which until recently largely focused on the performance impact of business group affiliation and specific forms of expropriation such as tunnelling

6.2 On Corporate Governance

The second part of this thesis aims to distinguish how the risk-taking behaviour of group affiliated and non-group firms are defined by corporate governance mechanisms. The findings will improve the understanding the effectiveness of corporate governance in monitoring group affiliated firms and non-group firms when it comes to risk-taking behaviour. From the literature, the importance of corporate governance is recognised due to 1) the constant reforms of corporate governance and 2) the impact of corporate governance on many corporate outcomes such as firm performance, dividend policy, capital structure and executive compensation. Hence, it is compelling to distinguish the risk-taking behaviour of group affiliated firms and non-group firms in emerging economies where ownership concentration co-exists with weak corporate governance.

The findings of this study are particularly interesting because in EMEs it is difficult to discipline entrenched owner-managers who generally cannot be removed through

internal or external (or market-based) mechanisms. It is established that each corporate governance attribute defines the risk-taking behaviour of both group affiliated firms and non-group firms uniquely. The size of board of directors indicates that the bigger the board size the less risk the firm undertake for both group affiliated and non-group firms. As for independent directors, proportion of female directors on board, financial institute and state representatives on board, they encourage risk-taking for both group affiliated and non-group firms. We relate this finding to the role of these categories of directors who are anticipated to protect the interests of minority shareholders by increasing investment and reducing free cash flow. This study does not find any statistically significant outcome when examining the role of corporate governance mechanisms in defining firm risk of business groups relative to their size, revenue and cash flow.

Regression analysis on the effect of corporate governance on firms with and without default risk shows that firms that are financially safe assumes lower risk than the firms that are financially distressed. This finding further confirms the role of financially safe firms acting as safety net for other affiliates that are too big to fail. Ian summary, corporate governance is an effective mechanism in defining the risk-taking behaviour of firms in EMEs regardless of their organizational form.

The contributions of this study in the literature of corporate governance in emerging economies are apparent from the findings. The findings show the efficacy of corporate governance codes and mechanisms that are based in developed country contexts with dispersed ownership structure to mitigate agency problems in emerging economy and subsequently determine their risk-taking incentives. With twenty years having elapsed since the broad features on Indian corporate governance transplanted from developed countries and stipulated as law, evidence from this study shows that these corporate governance norms have been somehow successful in mitigating agency problem of a different nature. Therefore, the corporate governance codes adopted from other jurisdiction may still need improvement to address the risk management issues. The study also contributes to the literature of business groups as the findings demonstrate the risk-taking behaviour of group affiliated firms in comparison to non-group firms.

6.3 On Capital Structure

The final part of this thesis aims to develop a Structural Equation Modelling to understand the two-way relationship of firm risk and capital structure of group affiliated firms and non-group firms. Taking into consideration the research gaps identified in the literature, two explanatory latent variables are incorporated 1) corporate governance mechanisms on firm risk and capital structure and 2) relationship banking on capital structure.

The findings show that both types of firms have similar capital structure even though it can be argued that business group affiliated firms will have lower debt to equity ratio because of their preference for internal funding facilitated by the internal capital markets enjoyed exclusively by the affiliated firms. Meanwhile, having a long-term relationship with their respective bankers does not contribute to any significant difference between group affiliated and non-affiliated firms.

This study provides new knowledge which contributes to the understanding the two-way relationship between firm risk and capital structure. This study is probably the first study that employs structural equations model to jointly model firm's risk-taking and capital structure within the same empirical framework. The application of SEM enables us to i)treat corporate governance as a latent variable that is measured by observable board characteristics, ii)include other observable variable that may influence firms capital structure as another latent variable, iii)produce more comprehensive robust results because SEM takes into account the modelling of interactions, non-linearities, measurement error to name a few, and finally, iv)using model fit measurement of SEM, we are able to identify of direct and indirect paths of the corporate governance, relationship banking, firm risk and capital structure.

6.4 Implications for Policymakers

This study reports the inner workings of business groups especially the association between organisation form, corporate governance mechanisms, capital structure

decisions and firm risk in emerging economies. The evidence from the empirical exercise show that the magnitude of internal capital market attribute of business groups is quite high in firm's strategic decisions. Group affiliated firms, on average, take lesser risk than non-group firm, which may have implications on entrepreneurial orientation of business groups and subsequently affecting the growth for emerging economies. Therefore, the findings open up room for deliberation by the government to facilitate creation of external functioning markets that facilitate risk management.

The efficacy of corporate governance codes adopted from the developed economies is also proven from the study. As it has been discussed before, the corporate governance codes borrowed from different settings to mitigate type 1 agency problems are somehow efficient in mitigating the problems with the entrenched management in firms with high ownership concentration. Therefore, firms in other emerging economies with high ownership concentration, minority shareholders, stock markets, and regulating bodies would gain new insights from this study in terms of the extent to which regulations, codes of corporate governance, decree, laws and resolutions can be implemented both internally and externally.

6.5 Implications for Management

The findings of this study may serve to improve the understanding of the inner workings of group affiliated firms in comparison to non-group firms, enhance the practices of corporate governance by the management and shareholders. The findings will also help management understand and demand for the more effective corporate governance mechanisms to be implemented. The significance of having the right corporate governance mechanisms to balance the acceptable and excessive risk-taking by firms in emerging economies is important to be recognised.

The result of this study would also benefit minority shareholders in the way they assess their investments in firms with high ownership concentration. For instance, even though board independence is ensured by regulations, this study shows that the

composition of board members plays an important role in protecting the interests of minority shareholders. Also, from the findings, minority shareholders will have increased understanding on the importance of having the right set of board composition to sit on the board of directors that will act in their best interests when it comes to making strategic decisions. Therefore, we argue that this study

6.6 Limitations of the Study

Like any other research, there would always be limitation to the studies carried out. The main limitation of the study is that the random basis is not applied in selecting the sample companies. The selection was based on the availability of data on annual financial statements, corporate governance data. Therefore, the quality of results depends on the quality of the sample data. In this regard, some companies may have been excluded from this study, which may have different characteristics than those that have been included in this study. In this case, the results are only valid to the extent that the sample is representative of the population. Second, although the study has focused on India, one of the largest emerging economy, the nature of organisations in this country may not be applicable or comparable to other studies done in different settings such as developed countries. However, this is not entirely a limitation as the results from the different settings could serve as contribution to the body of knowledge in corporate governance in emerging economies.

6.7 Future Study

This study only focused on an emerging economy, which have a good representative of the organisational form in question. There is a possibility of extending this study in the future to other countries settings that have comparable features and organisational forms to those of the present study in order to determine the validity of the findings in different environments and time periods. In addition, a comparative may shed light on further insight to the theory proposed in this study. As this study only included listed firm, a replication of the study using non-listed or small size companies to provide

broader understanding if the conclusion drawn in this study is conclusive. In addition, inclusion of other corporate governance mechanisms such as audit committee and executive compensation may further improve our understanding on the effects on firm risk.

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Appendix

Appendix 1 : Alternative Format Thesis Approval

REQUEST TO SUBMIT AN ALTERNATIVE FORMAT THESIS

Students should use this form to request permission to submit a doctoral thesis which contains sections which are in a format suitable for submission for publication in a peer-reviewed journal (or other appropriate outlet for academic research), alongside more traditional thesis chapters. This avoids the need for students to spend time rewriting publications into thesis chapters, as well as enhancing their writing for publication skills.

Requests to submit an alternative format thesis must be supported by the student's supervisory team and also require approval from the relevant Faculty and must therefore be made well in advance of the student submitting their thesis and no later than the end of the student's 3rd year of study.

Students wishing to submit in this format must read the guidance on structure of an alternative format thesis at: http://www.sheffield.ac.uk/ris/pgr/code/altformat

SECTION 1: STUDENT'S DETAILS	
NAME: Bavani Subramaniam	REGISTRATION NUMBER: 14014
DEPARTMENT: Management School	FACULTY: Social Science
PROPOSED THESIS TITLE: A Study of Risk Taking Behaviour in Emerging Market: The impact of Ownership Structure, Corporate Governance and Monetary Policy.	
REASON FOR THE REQUEST: The thesis consists of 3 chapters of different studies which are aimed to be published in Journals. The first two chapters are already written in a journal article format and going through internal review process to submit for publication. If this alternative thesis format is approved, it will save me a lot of time from rewriting the first 2 chapters. I plan to have 5 chapters in total 1. Introduction – To have a section that introduce the context of the study 2. Chapter 1 – Organizational structure and risk taking behaviour of firms in emerging economies 3. Chapter 2 – Corporate governance and risk-taking behaviour of firms in emerging economies 4. Chapter 3 – Risk taking behaviour of Banks in emerging economy (tentatively) 5. Conclusion – To have a chapter that summarises the findings of all the 3 papers Finishing my PhD in a timely manner is of my utmost importance as my funding will come to an end in 2018 and the approval of the alternative format thesis will be of great help.	
SIGNATURE: [redacted]	DATE 20.09.2017

SECTION 2: SUPERVISOR'S COMMENTS	
NAME: Sumon Kumar Bhaumik	DEPARTMENT: AFM-SUMS
COMMENTS IN SUPPORT OF THE REQUEST: It is now stylised in finance to focus on related but independent research questions in the empirical chapters, with the objective of publishing all three empirical chapters over time. Bavani's request is consistent with this trend in finance area doctoral research, and I therefore support it without reservation.	
SIGNATURE: [redacted]	DATE: 20.09.2017

Please return this completed form to one of the following email addresses, depending on your Faculty: Arts & Humanities - pgrarts@sheffield.ac.uk; Engineering - pgreng@sheffield.ac.uk; Medicine, Dentistry & Health - pgrmdh@sheffield.ac.uk; Science - pgrsci@sheffield.ac.uk; Social Sciences - pgrsocsci@sheffield.ac.uk

SECTION 3: FACULTY CONSIDERATION			
NAME: PAUL REILLY		FACULTY: FSS	
COMMENTS ON DECISION:			
☑	I approve this request for submission of an alternative format thesis	☐	I do not approve this request for submission of an alternative format thesis
SIGNATURE: [redacted]		DATE: 22/07/14	

Appendix 2 : Summary of 2-Digit Industry Code of Group Affiliates and Non-Group Firms for Chapter 3

This table presents the distributions of sample of manufacturing firm across industries between 2008 and 2014. The selected manufacturing firm are firm owned by group and stand-alone non-group firm listed in Bombay Stock Exchange (BSE Ltd.) and National Exchange of India Ltd. (NSE). The sample includes a total of 9,927 firm-year observations consisting 4,156 group firm and 5,771 non-group firm drawn from Prowess database provided by Centre for Monitoring Indian Economy Pvt Ltd.

2 Digit Industry Code	Industry	Group (N)	%	Non-Group (N)	%	Cumulative Percentage
10	Food products	372	49.34	382	50.66	7.60
11	Beverages	86	56.58	66	43.42	1.49
12	Tobacco products	14	50.00	14	50.00	0.30
13	Textiles	496	38.96	777	61.04	12.78
14	Wearing apparel	21	15.44	115	84.56	1.26
15	Leather and related products	21	18.42	93	81.58	1.21
16	Wood and products of wood and cork, except furniture	14	20.90	53	79.10	0.68
17	Paper and paper products	99	31.53	215	68.47	3.10
18	Books and Cards	0	0.00	7	100.00	0.08
19	Coke and refined petroleum products	28	31.46	61	68.54	0.83
20	Chemicals and chemical products	690	47.36	767	52.64	14.66
21	Pharmaceuticals, medicinal chemical and botanical	240	28.81	593	71.19	8.71
22	Rubber and plastics products	238	29.35	573	70.65	8.25
23	Other non-metallic mineral products	259	61.52	162	38.48	4.29
24	Basic metals	494	47.59	544	52.41	10.30
25	Fabricated metal products, except machinery and equipment	79	23.65	255	76.35	3.18
26	Computer, electronic and optical products	104	36.75	179	63.25	3.04
27	Electrical equipment	185	40.66	270	59.34	4.54
28	Machinery and equipment n.e.c.	241	45.99	283	54.01	5.43
29	Motor vehicles, trailers and semi-trailers	21	100.00	0	0.00	0.23
30	Other transport equipment	402	68.14	188	31.86	5.93
31	Furniture	0	0.00	3	100.00	0.04
32	Other	49	22.69	167	77.31	2.10
	Total	4,153	41.86	5,767	58.14	100.00

Appendix 3 : Summary of 2-Digit Industry Code of Group Affiliates and Non-Group Firms for Chapter 4

This table presents the distributions of sample of manufacturing firm across industries between 2008 and 2014. The selected manufacturing firm are firm owned by group and stand-alone non-group firm listed in Bombay Stock Exchange (BSE Ltd.) and National Exchange of India Ltd. (NSE). The sample includes a total of 9,032 firm-year observations consisting 3,898 group firm and 5,134 non-group firm drawn from Prowess database provided by Centre for Monitoring Indian Economy Pvt Ltd.

2 Digit Industry Code	Industry	Group (N)	Percentage	Non-Group (N)	Percentage	Cumulative Percentage
10	Food products	369	49.20	381	50.80	7.60
11	Beverages	86	56.58	66	43.42	1.49
12	Tobacco products	14	50.00	14	50.00	0.30
13	Textiles	488	38.88	767	61.12	12.78
14	Wearing apparel	21	15.44	115	84.56	1.26
15	Leather and related products	21	18.42	93	81.58	1.21
16	Wood and products of wood and cork, except furniture	14	20.90	53	79.10	0.68
17	Paper and paper products	95	31.15	210	68.85	3.10
18	Books and Cards	0	0.00	7	100.00	0.08
19	Coke and refined petroleum products	28	32.56	58	67.44	0.83
20	Chemicals and chemical products	682	47.16	764	52.84	14.66
21	Pharmaceuticals, medicinal chemical and botanical products	240	28.88	591	71.12	8.71
22	Rubber and plastics products	238	29.57	567	70.43	8.25
23	Other non-metallic mineral products	259	61.52	162	38.48	4.29
24	Basic metals	493	47.68	541	52.32	10.30
25	Fabricated metal products, except machinery and equipment	79	23.72	254	76.28	3.18
26	Computer, electronic and optical products	104	36.75	179	63.25	3.04
27	Electrical equipment	185	40.66	270	59.34	4.54
28	Machinery and equipment n.e.c.	240	46.33	278	53.67	5.43
29	Motor vehicles, trailers and semi-trailers	21	100.00	0	0.00	0.23
30	Other transport equipment	402	68.14	188	31.86	5.93
32	Other	49	22.69	167	77.31	2.10
	Total	4,128	41.90	5,725	58.10	100.00

Appendix 4 : Summary of 2-Digit Industry Code of Group Affiliates and Non-Group Firms for Chapter 5

This table presents the distributions of sample of manufacturing firm across industries between 2008 and 2014. The selected manufacturing firm are firm owned by group and stand-alone non-group firm listed in Bombay Stock Exchange (BSE Ltd.) and National Exchange of India Ltd. (NSE). The sample includes a total of 25,466 firm-year observations consisting 15,948 group firm and 9,518 non-group firm drawn from Prowess database provided by Centre for Monitoring Indian Economy Pvt Ltd.

2 Digit Industry Code	Industry	Group (N)	Percentage	Non-Group (N)	Percentage	Cumulative Percentage
10	Food products	1464	70.93	600	29.07	8.10
11	Beverages	139	65.57	73	34.43	0.83
12	Tobacco products	71	75.53	23	24.47	0.37
13	Textiles	1946	55.89	1536	44.11	13.67
14	Wearing apparel	67	31.75	144	68.25	0.83
15	Leather and related products	7	4.61	145	95.39	0.60
16	Wood and products of wood and cork, except furniture	11	7.97	127	92.03	0.54
17	Paper and paper products	259	40.28	384	59.72	2.52
19	Coke and refined petroleum products	282	71.57	112	28.43	1.55
20	Chemicals and chemical products	2396	73.93	845	26.07	12.73
21	Pharmaceuticals, medicinal chemical and botanical products	779	47.27	869	52.73	6.47
22	Rubber and plastics products	987	62.04	604	37.96	6.25
23	Other non-metallic mineral products	1136	75.53	368	24.47	5.91
24	Basic metals	2106	61.52	1317	38.48	13.44
25	Fabricated metal products, except machinery and equipment	436	55.05	356	44.95	3.11
26	Computer, electronic and optical products	219	47.00	247	53.00	1.83
27	Electrical equipment	622	54.23	525	45.77	4.50
28	Machinery and equipment n.e.c.	913	71.72	360	28.28	5.00
29	Motor vehicles, trailers and semi-trailers	170	100.00	0	0.00	0.67
30	Other transport equipment	1607	78.89	430	21.11	8.00
32	Other	331	42.22	453	57.78	3.08
	Total	15,948	62.62	9,518	37.38	100.00