Economic Transition and the Value of Business Group Affiliation: Evidence from the Indian Market*

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This draft: December 15, 2011

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*Acknowledgements: We thank Shashidhar Murthy, Padmini Srinivasan, Ravi Anshuman, Yishay Yafeh, Raveendra Chittoor, Ron Edwards, Apalak Khatua and Jayant Kale for helpful suggestions. All remaining errors are ours.

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Abstract

There is growing evidence that institutional voids theory proposed by Khanna and Palepu (1997, 2000a) is too simple to explain the value of business group affiliation (Carney et al., 2011). We contribute to the literature by revisiting the debate through a longitudinal analysis during economic transition. Our approach not only uncovers the dynamics of business group structural factors on affiliates' value but also integrates the merits of several alternative theories which can help to resolve several inconsistencies in the literature. Using 44,000 firm year observations of Indian business groups and standalone firms, for the period 1990-2009, we report the following four main findings: 1) the value spread between business group affiliates and standalone firms persists over time: groups are valued higher than standalone firms. However, the economic value of the value spread narrows over time; 2) the risk premium associated with institutional voids is priced in the capital market; 3) the value advantage of business group affiliated firms is determined mainly by business group scale related structural advantage and not due to business group scope related structural advantage as proposed by Khanna and Palepu (1997, 2000a); and 4) business group scope related dynamics affect affiliated firms' value.

JEL Classification: G 14.

Keywords: Business Groups, Institutional Voids, Scale and Scope of Business Groups.

Business groups, though ubiquitous in several emerging and a few developed economies, are relatively under-researched and poorly understood in spite of their primal role in those economies [Credit Suissee (2011)[1], Colpan et al. (2010) etc.]. Colpan et al. (2010) state that the "definitions and conceptualizations" of business groups vary across nations and academic disciplines. Even though it is widely accepted that the predominance of business groups in emerging markets is a strategic response by firms to poor institutional environment associated with these markets (Khanna and Palepu 1997, 2000a and Masulis et al., 2011), what is widely under contention is whether such response is strategic enough to create value. Most recently, Carney et al. (2011) provide an excellent survey and meta-analysis based evidence on 141 scholarly papers on business groups in 28 countries that tried to address the question of business group behavior and affiliates' performance. In the recent past, two survey papers, namely, Carney et al. (2011) and Khanna and Yafeh (2007) find that the evidence on business group strategy and performance is mixed and the question whether the strategic role played by group structure adds value is still wide open. They point out that divergence of opinion on the value of group affiliation can be mainly attributed to usage of mono-theoretical lenses by researchers such as agency theory (Morck and Yeung, 2003), transaction cost theory (Luo and Chung, 2005), exchange theory (Keister, 2001), resource-based theory (Guillen, 2000), and co-insurance theory (Khanna and Yafeh, 2005) to explain costs and benefits of business group affiliation. Carney et al. (2011: 452) argue that: *"Whereas each of these theories offers a useful perspective on business group behavior and performance, none of them in isolation suffices to explain this complex and variegated organizational form"*. Likewise, Khanna and Yafeh (2007) argue that business groups are responses to different market conditions and from a welfare point of view they can be viewed some times as 'paragons' and some times as 'parasites'. In summary, the literature on business groups is at a stage where any further investigation warrants usage of a more holistic, dynamic, and long term view on the value of business group affiliation.

[1]This study reports that family business groups account for a third of Asia's market capitalization and close to half of India - indicating their dominance and importance.

We extend the literature by investigating two decades of business groups' evolution process in the Indian market. In particular, we investigate whether strategic choices of business groups in response to both existing and changing market conditions (along with changes in corresponding institutional environment) add value to their affiliates. In order to address this question, we develop a more holistic framework by using scope of business groups as the main differentiating factor. Our framework aims to integrate several theories developed to explain the rationale behind business group structure and affiliates' performance. We argue that the decomposition of business group structural value into scale and scope (as suggested by Carney et al., 2011) provides a more fine grained analysis to disentangle the value due to strategic choices made by business groups. Although institutional voids theory (Khanna and Palepu, 1997 and 2000a) provides a framework for understanding the rationale behind the existence of business groups, it is too broad to explain the nuances of business group structural value. Several studies (for example, Khanna and Rivkin, 2001) have shown that the opportunities and corresponding benefits of institutional voids are not uniform across markets and also responses of business groups through structural dynamics vary accordingly. Hence, it is hard to justify whether the value of business group affiliation is mainly driven by their strategic diversification (scope related) aimed at exploiting institutional voids as proposed by Khanna and Palepu (1997, 2000a) (Carney et al., 2011).

Our approach is based on the framework that formation of business groups as a response to institutional voids environment results in two profound effects. The first order effect is the scale at which it can operate. The creation of internal institutions, as a response to institutional voids environment, provides infrastructure that can be used as a leverage to expand. This provides the first order competitive advantage for business group affiliated firms. The second order effect is mainly due to the increased scope of operations. The increased scale also allows business groups to invest in new growth opportunities with ease. In the process, such new investments increase the scope of business groups or ensure diversification of operations and corresponding business interests. In this setting, scale related benefits are predictable. The more the institutional voids, the higher are the scale related structural benefits. However, scope related benefits are not that clear. Scope is a more dynamic and more complex process.

The most visible benefit of scope is the diversification based risk-sharing benefit which is quite valuable in an environment with institutional voids (Khanna and Yafeh, 2005). Along with risk-sharing, the benefits of scope include exploitation of growth opportunities in emerging economies (Guillen, 2000; Khanna and Palepu, 1997), information sharing advantages while managing varied projects (Khanna and Palepu, 2000a) and ease of getting new projects due to political power (Carney, 2004). However, scope also implies several additional costs of doing business. This may include agency costs that arise due to controlling owners' private benefits of control (Claessens et al., 2000), increased transaction costs associated due to changing market conditions (Hoskisson et al., 2004, and Luo and Chung, 2005), power struggle related costs (Kim et al., 2004), bureaucratic and coordination costs (Hoskisson et al., 2005) etc. Hence, Khanna and Palepus' (1997, 2000a) institutional voids theory that attributes group affiliation value mainly to its scope has not yielded consistent results (Carney et al., 2011). Our focus on scope related structural dynamics tries to explain under what conditions, the net effect of scope can be positive or negative. We also support our argument with a simple theoretical framework to illustrate the effects of scope dynamics in Appendix D.

We decompose scope into static and dynamic scope components. We argue that scope being a dynamic strategy, such decomposition can help to uncover the conditions under which the net effect of scope can be positive or negative. At the same time, our approach can resolve both theoretical and empirical inconsistencies on the role of scope on affiliated firms' value. We model scope as a dynamic response to overall market expansions and contractions. The value due to scope is determined by the relative response of a given business group to overall market direction. We also associate dynamics of scope response to market conditions with various theories associated with the costs and benefits of scope. For instance, if a business group increases its scope more than average market scope during market expansion, then the benefits due to scope can outweigh the costs due to scope (Guillen, 2000). On the other hand, if business groups reduce their scope less than overall market scope during market contractions, then the benefits of not shelving new projects (business sustainability) are complemented with risk-sharing benefits associated with scope (Khanna and Yafeh, 2005). Thus, our approach helps to understand the role of business group structural strategy on affiliates' value by integrating the merits of several existing theories on busi-

ness group affiliates' performance.

We also extend the literature by linking the notional value spread between business group affiliated firms and standalone firms, due to institutional voids, to actual pricing of such value based risk-return trade-off in competitive capital markets. If business group affiliated firms are valued higher than similar standalone firms due to institutional voids and if both firms are actively traded in stock markets, then investors would demand a higher expected return for investing in a standalone firm compared to a similar business group affiliated firm. This higher expected return reflects additional compensation required for bearing the risk faced by standalone firms in a market with institutional voids. In other words, institutional voids should be priced in competitive markets. Also, we investigate whether, the risk related to scale and scope of business group structure is priced in the stock market. The same logic can be applied for this analysis: within business groups, group scale and scope should explain the cross sectional and time series variation of risk difference between business groups.

Using 44,000 firm year observations of both Indian business group affiliated firms and standalone firms for the period between 1990-2009, we investigate 1) whether the value spread between business group affiliated firms and standalone firms changes with changing and developing institutional environment in India; 2) is the risk associated with institutional voids priced in the capital market and does it correspond to the changes in value spreads between business group affiliated firms and standalone firms over time; 3) what is the role of business scale and scope of operations on business group affiliated firms' value; and 4) whether scope related group level structural changes, as a response to changing market conditions, affect business group affiliates' value.

Our four main findings are as follows: a) the value spread between business group affiliates and standalone firms persists over time: groups are valued higher than standalone firms. However, the economic value of the value spread narrows over time. Group affiliation is more valuable in the first decade (1990-1999) compared to the second decade (2000-2009) of our study period. This result is consistent with the extant literature on business groups (Khanna and Rivkin, 2001); b) the value spread is priced in the capital

market: the expected return for a business group affiliate firm is lower than for a corresponding standalone firm. However, the expected return spread decreases over time. This confirms that the institutional voids in India are decreasing over time; c) the value advantage of business group affiliated firms is determined mainly by the business group scale related structural advantage and not due to the scope related structural advantage. This result is not only consistent with the observations of Carney et al. (2011) but also provides the first evidence that questions the value of business scope as proposed by Khanna and Palepu (1997, 2000a); and d) the dynamic response of business group scope to market expansions and contractions adds value due to several offsetting effects. Overall, our findings recognize that business groups are quite complex to be explained by any one particular theory. A more holistic approach can not only resolve some of the inconsistencies in the literature but also helps to broaden our horizon to appreciate the complexities associated with understanding the drivers of business group affiliation value.

The rest of the paper is organized in four sections. A brief background and our holistic framework is introduced in Section I. We also introduce our dynamic scope response methodology aimed at capturing the value of group scope response to changing market conditions. Section II describes the data and the research methodology. Section III reports and provides analysis of our results. Section IV concludes.

I FRAMEWORK AND HYPOTHESES

A. The value of business group structural dynamics

The extant literature identifies several factors affecting business group affiliates' value. All major factors can be broadly classified into three categories, namely, environmental conditions (business, legal and political), business group structure (ownership structure, scale and scope of operations and efficiency of internal institutions) and structural dynamics of business groups in changing environmental conditions. The research evidence based on the first factor is quite consistent. Business groups add value to their affiliates when external business infrastructure is weak (Khanna and Palepu, 1997 and Masulis et al., 2011), investor protection is weak (Aganin and Volpin, 2005 and Masulis et al., 2011), contract enforcement is inefficient (Maurer and Sharma, 2001 and Masulis et al., 2011) and when political influence on business

operations is strong (Carney, 2004). Also, there is consistent evidence that business group affiliation value decreases when the environmental conditions improve. This implies that environmental conditions provide a setting for business group value creation (Khanna and Palepu, 1999).

The second factor indicates that the setting alone cannot explain the group affiliation value; how business groups structure themselves to benefit from the setting is also important. This factor attributes the value to cross sectional differences among business groups and also across countries (Khanna and Rivkin, 2001). The initial findings on business group structure indicate that diversification or increasing the scope of business is a predominant factor that creates value (Khanna and Palepu, 2000a and 2000b). The rationale for this argument comes from many directions. For instance, growth opportunities can be easily exploited using various resources and skills accumulated by the business group (Chang and Hong, 2000). Also, network effect adds value for timely information sharing on the available growth opportunities (Luo and Chung, 2005). In turn, such investments in growth opportunities are better protected and enhanced as variety in project risks reduces overall group level risk. Lower risk level also implies lower costs for funding growth opportunities (Khanna and Yafeh, 2005).

However, what can go against the value creation through diversification is diversity. The affiliate level diversity in terms of controlling owner's ownership (Douma et al., 2006), whether the affiliate is held public or private, power of affiliate managers at the group level (Rajan et al., 2000) and the corresponding bureaucratic and coordination costs (Hoskisson et al., 2005). Hence, scope can have offsetting effects on business group affiliates' value. This is quite evident through mixed evidence in the literature (Carney et al., 2011). The other factor that is related to business group structure is its scale of operations. Literature either mixes scale with scope as a strategic move by business groups or is silent about the role of scale on affiliates' value (Carney et al., 2011)[2]. It is important to note that scale is the basis for scope. Unless there are enough scale benefits, scoping is virtually ruled out. Unlike scope, scale does not affect diversity and at the same time it takes advantage of the environmental conditions. Hence, the effect of scale should be

[2]For example, in their landmark papers, Khanna and Palepu (2000a and 2000b) do not differentiate between group scale and scope but state that large groups are highly diversified and vice versa. While this conceptualisation is valid, the failure to disentangle the effects of group scope and group scale might lead to spurious inferences.

positive on group affiliates' value.

The third factor on the structural dynamics of business groups with changing market conditions is less understood. How business groups change, in particular, their scope of operations can help to understand the effects of scope on business group affiliates' value (Peng et al., 2005). Our contribution to the literature mainly comes by addressing this dimension. Given that structural responses of business groups are mainly aimed to exploit the environmental conditions, we model business group structural changes as a function of changes in the market conditions. To be more specific, we assume that business group scope changes (expansions and contractions) are mainly a response to market expansions and contractions (scope dynamics). Hence, the change in group scope to changing market conditions unleashes the expected value effect on group affiliates. For instance, if group scope expands more than the average market scope (expected response), then such abnormal change in the scope can significantly create or destroy affiliates' values due to possible significant changes to the business group affiliates' future cash flows and project specific risk.

Figure 1 depicts the possible value effects due to change in business group scope as a response to change in overall market scope (market expansions and contractions) in a simple 2x2 matrix[3]. The Figure presents the possible value effects in four boxes for each expansion/contraction combination of market scope and business group scope. In the first case, when a business group expands its scope as a response to the overall market scope expansion, the relative difference in the positive (negative) value effects due to growth opportunities and risk sharing (due to increase in diversity related costs) depend on the degree of business group scope expansion compared to overall market scope expansion. We expect that groups that expand their scope more than the average market scope will have a positive net effect. In other words, we expect that the positive factors associated with scope will outweigh its negative factors when the overall market level growth opportunities are improving[4].

[3]See Appendix A for brief summaries of the theories mentioned in Figure 1

[4]This holds better when growth opportunities are modeled as a non-linear function and diversity costs as a linear function. The rate of change in the diversity costs is assumed to be same for all firms in the economy. However, growth is mainly a function

		Market growth opportunities	
		Increase	**Decrease**
Group scope	**Increase**	1. Growth opportunities effect: *Positive* impact 2. Costs of doing business effect: *Negative* impact 3. Risk sharing effect: *Positive (low)* impact	1. Growth opportunities effect: *Negative* impact 2. Costs of doing business effect: *Negative* impact 3. Risk sharing effect: *Positive* impact
	Decrease	1. Growth opportunities effect: *Negative* impact 2. Costs of doing business effect: *Positive* impact 3. Risk sharing effect: *Negative (low)* impact	1. Growth opportunities effect: *No* impact 2. Costs of doing business effect: *Positive* impact 3. Risk sharing effect: *Negative* impact

Effect	*Corresponding Theories*
Growth opportunities	Resource-based view (Guillen, 2000) / Exchange theory (Keister, 2001) / Institutional voids theory (Khanna and Palepu, 1997)
Costs of doing business	Transaction costs theory (Hoskisson et al., 2005) / Agency theory (Claessens et al., 2000)
Risk sharing	Risk sharing theory (Khanna and Yafeh, 2005)

Figure 1: Linking theoretical predictions with the dynamics of scope in changing market conditions

In the second case, when market scope contracts, a higher degree of contraction of business group scope can have overall negative effect. This is because; contraction of business group scope not only constrains funding the existing growth opportunities (and the corresponding future cash flows) but also reduces the risk-sharing benefits (and corresponding increase in the risk) that are more critical and valuable during market contractions. In addition to that, those business groups which do not contract their scope due to contraction of overall market scope may experience net benefit in the long run. This can happen due to risk-sharing benefits that help business group affiliated firms to survive during overall market contractions by supplying lower cost of capital for group affiliates (due to risk-sharing benefit) compared to other firms in bad market conditions. Hence, group structure helps group affiliated firms

of future market conditions. Hence, any higher degree of expansion would lead to non-linear increase in diversification benefits and linear increase in diversity costs. It is common in the literature to model agency costs (diversity costs) due to the gains of private benefits of control as proportional to the controlling owner's cash flow and voting rights (La Porta et al., 1999) and growth as an exponential variable. However, it is not restrictive that this non-linear functional relationship should hold. In market with institutional voids, affiliated firms generally have better growth opportunities than standalone firms. Hence, affiliated firms can expand with more ease during market expansions.

to fund projects and survive better than other firms. This survival ability can add long term value for group affiliates[5]. Similarly, the third and fourth case in the 2x2 matrix can be explained using the same logic and thus, when business groups contract their scope when overall market scope expands, we expect a net negative effect. Likewise, if business groups contract more than market contraction, we expect a net negative effect[6] . In summary, *business group scope adds value to their affiliates when they expand their scope more aggressively than market scope or when they contract their scope less aggressively than market scope.*

B. Measurement of scope dynamics

We provide the following measurement framework to test the implications of scope dynamics. In order to measure the scope dynamics we present a simple functional relationship. Later we use this measure while empirically testing the effects of scope dynamics on group affiliates' value.

Our measurement of scope tries to capture the change in group scope for a given change in the overall market scope. $S_{i,t}$ is the scope of group *'i'* at time *'t'* and $\Delta S_{i,t}$ is the change in group *'i'* scope between time *'t-1'* to *'t'*. Now, scope can be defined as follows:

$$S_{i,t} = S_{i,t-1}(1 + \Delta S_{i,t}) \tag{1}$$

Assuming that the scope distribution is uniform in the economy, the expected response of business group *i* to changing market conditions is the market average scope change. This implies that:

$$E[\Delta S_{i,t}] = \Delta 1/N \sum_{i=1}^{N} S_{i,t} \tag{2}$$

[5]It can be argued that investors discount those firms that do not contract as a response to economic contractions. However, this argument is less significant in our setting for two important reasons, namely, 1.The negative effects of contraction are mainly applicable to scale based factors than scope based factors. Our analysis is mainly with relation to scope based factors; 2.Our analysis is on business groups. Unlike standalone firms, the positive effects of co-insurance through scope based factors offset the negative effects of contraction.

[6]See Appendix D for a simple theoretical framework

From (1) and (2) we can rewrite expected scope of business group *i* as follows:

$$E[S_{i,t}] = S_{i,t-1}\left[1 + \Delta 1/N \sum_{i=1}^{N} S_{i,t}\right] \tag{3}$$

If the observed value of change is group scope $\Delta S_{i,t}$ is greater (lesser) than expected change in the group scope $E[\Delta S_{i,t}]$, then the group expands more (less) than the market average. Hence, Equation (3) can be used to measure scope dynamics of business groups. This measure can be used to explain the role of scope dynamics on firm value. For empirical implementation of this framework, we can use Herfindahl index(inverse) as a proxy of scope (diversification measure). For example, we can calculate scope dynamics of a given group by taking the deviation between change in the average market wide Herfindahl index(inverse) and the group level Herfindahl index(inverse) change.

C. Measuring the risk of institutional voids environment

Although institutional voids are widely accepted as the drivers for group value creation, it is mainly a notional concept when it comes to measurement.[7] If institutional voids really exist, then the risk of exposure to the voids should be priced in competitive markets. This implies that investors investing in firms which are exposed to institutional voids should demand a higher expected return compared to firms that are insulated from the institutional voids in the same market. In an asset pricing context, the institutional voids risk should be priced and hence the value spread between firms that are exposed to institutional voids and firms that are insulated against the institutional voids should explain the expected returns differences of the two firms. This approach helps us to explain the costs of raising funds between business groups affiliated firms and standalone firms in a more robust way. Given that business group structure is expected to insulate group affiliated firms from the institutional voids, one would expect investors demanding a higher expected return while investing in standalone firms compared to group firms. This implies that standalone firms carry additional risk due to their exposure to institutional voids. Hence, the cost of raising capital for standalone firms is expected to be higher than business group affiliated firms.

[7] Some papers have attempted to measure a subset of institutional voids by using a few macro-economic variables. E.g.: Khanna and Palepu (2000b), Carney et al. (2011), Lee et al. (2008) etc.

We extend the same logic to the structural dynamics of business groups. If business group scale of operations is valuable, then affiliates of those business groups that are large should incur lower cost of capital compared to affiliates of smaller business groups. According to the risk sharing theory (Khanna and Yafeh, 2005), increased group scope reduces the overall risk of the group. This benefit should lower the cost of capital of affiliated firms belonging to diversified groups.

The institutional voids risk approach also strengthens the evolutionary predictions of business groups. If institutional voids diminish due to institutional development, then the reduction of group affiliation benefits should also be reflected in the expected return differences between business groups affiliated firms and standalone firms. The expected return difference between standalone firms and group affiliated firms should decrease over time, reflecting the reduction of institutional voids based risk.

We use a modified version of the 4 factor asset pricing model (Carhart, 1997) for calculating the relationship between several risk factors and the expected returns of firms. In addition to the original four factors as in Carhart (1997), a fifth factor measuring the risk premium of operating in an institutional voids environment is included in the modified model. This modified model with five factors is referred to as the “Institutional Voids Factor Model" or IVFM.

The other four factors are aimed to capture the expected return (excess return over the risk free rate R_f) $[E(R_i) - R_f]$ difference between firms that might arise due to differential impact of systematic market risk (average market return in excess of the risk free return, ERM), size difference (return differences in the portfolios of Small and Big firms, SMB), valuation difference (return differences in the portfolios of High and Low value firms, HML)[8] and trading price pattern based difference that lead to price trends or momentum (return differences in the portfolio of firms that have consistent upward movement and consistent downward movement, UMD). The difference in the returns of non-group and group firms (NMG) can be construed as the risk premium of operating in an institutional voids environment. Table 5 provides

[8] in the 3 factor asset pricing model (Fama and French,1996)

more details on the definitions and the methodology used to construct the factors.

Using standard notation, the IVFM can be represented as

$$E(R_i) - R_f = f[[E(R_m) - Rf], (SMB), (HML), (UMD), (NMG)]$$

D. Testable hypotheses

Two sets of hypotheses emerge from our above discussion. The first set of hypotheses is based on advancements in the business groups literature. The second set of hypotheses is based on our new insights drawn through a more holistic framework[9].

Hypotheses based on existing evidence:

H.1 *Business group affiliated firms should be valued more than similar standalone firms. However, the value spread should diminish over time reflecting institutional development in emerging economies (Khanna and Palepu, 2000b and Khanna and Rivkin, 2001).*

H.2 *Business group scale (scope) of operations should have a positive (negative) effect on the value of business group affiliates (Carney et.al. 2011).*

Hypotheses based on our framework:

H.3 *Business groups should benefit from being aggressive during market expansions and insensitive during market contractions.*

H.4 *The risk due to institutional voids captured through the return spreads between standalone firms and business group affiliated firms should be priced in the capital market.*

[9]We revisit Khanna and Palepu (2000a) evidence on Indian market to examine its validity with data for more than fifteen years following their evidence. This is warranted not only because of the literature advancements but also because of the limitations of Khanna and Palepu (2000a) study. In their study on Indian market, they use only one year (1993) cross sectional data on Indian business groups and standalone firms. Given the dynamic nature of business group evolution process, further analysis over a longer period of time advances India specific evidence.

H.5 *The cost of capital for business group affiliated firms should be lower than for similar standalone firms. However, the difference should diminish over time reflecting the reduction in the institutional voids risk.*

H.6 *Increase in group scope and scale of operations should reduce the cost of capital of business group affiliates.*

II DATA AND METHODOLOGY

A. Data

The primary data source is the Prowess database maintained by the Center for Monitoring Indian Economy (CMIE). As Siegel and Choudhury (2010) observe, data from Prowess has been used in several studies in the finance and strategy literature and is generally accepted as the most reliable database for Indian companies. Prowess provides both accounting and stock market data. Group affiliation and industry classification data are also obtained from Prowess. Khanna and Palepu (2000a) document that the ownership and industry classification provided by Prowess is fairly accurate. Prowess assigns a 5 digit National Industrial Classification (NIC) Code to all companies and this is used for industry classification in this study. The NIC Code for economic activity is based on the International Standard Industrial Classification (ISIC) of Economic Activities developed by the United Nations. The latest NIC was released by the Government of India in 2008 and is based on ISIC revision-4.

B. Sample Selection

The sample period for the study is the 20 year period from 1990 to 2009. Though Prowess has data on Indian companies from the year 1988, the coverage is very sparse pre-1990. In order to understand the evolution of the Indian economy and the resultant effects on the relative performance of group affiliated and unaffiliated firms, we present all analyses for 3 periods - The full sample period (1990 to 2009), Regime-1 (1990 to 1999) and Regime-2 (2000-2009). The liberalization and reform process of the Indian economy started in 1991 and there have been continuous and numerous reforms in the last two decades. Appendix C summarizes the prominent reforms during this period. The desired changes from the reforms

are gradual and will reflect in economic performance over a period a time and not immediately[10] . Since changes in an economy are secular, it is vital to study long periods of data to identify and analyse patterns. Appendix C shows that almost all the major developments related to product, capital and labour market culminate by year 2000. In light of this, we chose to split the sample period into two regimes corresponding to the two decades.

The sample consists of all non-financial firms affiliated with Indian business groups and unaffiliated Indian firms (otherwise known as standalone firms)[11] . Following Gopalan et al. (2007), groups with less than 3 companies in a year are excluded from the sample for that year[12] . We employ 2 sets of regressions based on firm performance and firm cost of capital to test our hypotheses. Firm performance is measured by the Q ratio[13] . The Q ratio was obtained for all affiliated and unaffiliated firms and was trimmed at the 5th and 95th percentile in order to avoid potential problems with outliers. This resulted in 44,000 firm-year observations over the 20 year sample period. Other relevant variables were obtained for these firm-year observations. Following Khanna and Palepu (2000a), we assume that there is no diversification at the firm level for both group affiliated and standalone firms. In other words, we assume that each firm has substantial operations in only one industry[14] . Group scope (diversification) is measured by the inverse (reciprocal) of Herfindahl Index (based on 2-digit NIC codes) and group scale (size) is measured by the number of companies in the group. Note that these two measures are applicable for only group affiliated firms.

For cost of capital regressions, monthly stock returns of non-financial firms are considered for the analysis. (Fama and French, 1992). Monthly adjusted[15] closing share prices are available in Prowess database from Jan-1990 (and hence the first available monthly return is for Feb-1990). Table 5 provides

[10] As Khanna and Palepu (2000b) state - “Institutional voids are unlikely to be mandated away"

[11] i.e. Government firms, foreign firms, firms affiliated to foreign business groups etc. are excluded

[12] Such small groups can neither be considered as business groups nor as standalones. Hence they are excluded.

[13] See Appendix B for variable definitions

[14] Prowess classifies firms having substantial operations in more than one industry as "Diversified" firms (NIC code 97000). Such firms are few in number and have been excluded from the sample.

[15] Price adjusted for stock splits and bonus issues. In order to avoid stale information, price considered is not earlier than 7 days from the last trading day of the month

details of our calculations.

C. Methodology

All regression models specified in this section are run for three periods viz., all years (1990 to 2009), Regime-1 (1990 to 1999) and Regime-2 (2000 to 2009). We make two distinct but related contributions to the understanding of business group structures. Hypotheses 1 to 3 deal with the relative performance of group and non-group firms: the regression models used to test them are termed “Firm performance regressions" and have Q as the dependant variable. Hypotheses 3 to 6 deal with the cost of capital of group and non-group firms: the regression models used to test them are termed “Firm cost of capital regressions" and have monthly stock excess return as the dependant variable. It is pertinent to note that the two regression sets are not independent but complement each other and aid us in understanding business groups from different angles. Further, Q is an all-encompassing measure that captures various aspects like firm performance [Carney et al.(2011), Douma et al.(2006), Khanna and Palepu (2000a and 2000b) and many more], monopoly power (Lindenberg and Ross, 1981), investment opportunities (Chen and Ho, 1997) etc. However, we use Q as a performance measure to be consistent with and to ensure that our study is comparable with the extant literature. While using a performance measure like Q is wide-spread, we believe that the usage of stock returns and asset pricing factor models to analyse business group affiliation is a novel contribution of this paper[16].

D. Firm performance regressions

Random Effects Generalized Least Squares (GLS-RE) panel estimation is used for all firm performance regression specifications. In the regression models, subscript *‘j’* indicates a firm, *‘i’*indicates a group and *‘t’* indicates the time period (year). Industry and year dummies are included in all models to control for industry and time effects. Robust standard errors are calculated to correct for possible heteroskedasticity.

[16]The evidence from the two regression sets are consistent with each other and hence increase our confidence in the overall results. See the Results and Conclusion sections for more details

Hypotheses-1 is primarily interested in the relative performance of group and non-group firms. The following regression specification, run on both group (BG) and standalone (SA) firms, is used to test Hypotheses-1

Model-M:

$$Q_{j,t} = constant + \beta_1 * (BG\ dummy)_{j,t} + \beta_2 * ln(firm\ sales)_{j,t} + \beta_3 * (firm\ depreciation/sales)_{j,t} + \beta_4 * (firm\ leverage)_{j,t} + \beta_5 * ln(firm\ age)_{j,t} + \beta_6 * (firm\ IAOP)_{j,t} + \varepsilon_{j,t} \quad (4)$$

BG dummy is the business group dummy which equals 1 for group affiliated firms and 0 for standalones. If β_1 is positive and significant, it indicates that group membership adds value. If $\beta_1$for Regime-2 is lesser than β_1 for Regime-1, we can conclude that the value spread between group and non-group firms has diminished over time; reflecting institutional development. In line with extant literature, control variables are included for firm size, leverage and age. Depreciation/sales is a proxy for investment opportunities. Since investment opportunities influence firm performance, this is included as a control variable (Fich and Shivdasani, 2006). Khanna and Yafeh (2007) state that group affiliated firms "may wield considerable market power" vis-a-vis standalone firms and hence a variable measuring market power is included. Following Peress (2010), market power of a firm is measured using industry-adjusted operating profit ratio(IAOP). Firm sales and firm age are transformed into their natural log forms on account of their wide dispersion and to control for possible heteroskedasticity[17].

The following 3 regression models (run on a sub-sample of only BG firms) are used to test Hypothesis-2 on the effect of group scope and scale on affiliated firm performance. Models BG1 and BG2 test individually for the effect of scope and scale respectively; whereas, Model-BG3 tests for both effects

[17]detailed variable definitions are presented as a separate table in Appendix B

simultaneously.

Model-BG1:

$$Q_{j,t} = constant + \beta_{1a} * (Group\ HII)_{i,t} + \beta_2 * ln(firm\ sales)_{j,t} + \beta_3 * (firm\ depreciation/sales)_{j,t} + \beta_4 * (firm\ leverage)_{j,t} + \beta_5 * ln(firm\ age)_{j,t} + \beta_6 * (firm\ IAOP)_{j,t} + \varepsilon_{j,t} \quad (5)$$

Model-BG2:

$$Q_{j,t} = constant + \beta_{1b} * (Group\ CC)_{i,t} + \beta_2 * ln(firm\ sales)_{j,t} + \beta_3 * (firm\ depreciation/sales)_{j,t} + \beta_4 * (firm\ leverage)_{j,t} + \beta_5 * ln(firm\ age)_{j,t} + \beta_6 * (firm\ IAOP)_{j,t} + \varepsilon_{j,t} \quad (6)$$

Model-BG3:

$$Q_{j,t} = constant + \beta_{1c} * (Group\ HII)_{i,t} + \beta_{1d} * (Group\ CC)_{i,t} + \beta_2 * ln(firm\ sales)_{j,t} + \beta_3 * (firm\ depreciation/sales)_{j,t} + \beta_4 * (firm\ leverage)_{j,t} + \beta_5 * ln(firm\ age)_{j,t} + \beta_6 * (firm\ IAOP)_{j,t} + \varepsilon_{j,t} \quad (7)$$

The Group Herfindahl Index Inverse (Group HII) measures the scope (diversification) of a business group and the Group Company Count (Group CC) measures the scale (size) of a business group . For all firms belonging to group *'i'*, the Group HII and Group CC variables are set equal to group *i*'s HII and CC respectively each year. The control variables are the same as in Model-M above. Model-BG3 is the vital specification as it simultaneously tests for the effect of scope and scale on affiliated firm performance. Since group scope (scale) is hypothesized to have a negative (positive) effect on affiliated firm value, we expect β_{1a} and β_{1c} to be negative and β_{1b} and β_{1d} to be positive.

Model-BG4 is used to test Hypothesis-3 on group scope dynamics.

Model-BG4:

$$Q_{j,t} = constant + \beta_{1c} * (Group\,HII)_{i,t} + \beta_{1d} * (Group\,CC)_{i,t} + \beta_{1e} * (DSR)_{i,t} + \beta_2 * ln(firm\,sales)_{j,t} + \beta_3 * (firm\,depreciation/sales)_{j,t} + \beta_4 * (firm\,leverage)_{j,t} + \beta_5 * ln(firm\,age)_{j,t} + \beta_6 * (firm\,IAOP)_{j,t} + \varepsilon_{j,t} \quad (8)$$

Model-BG4 is the same as Model-BG3 except for the inclusion of the Dynamic scope response (DSR) variable. The DSR is the product of a group's scope and the deviation of change in the group's scope from the change in the average market scope. DSR for group *'i'* at time *'t'* in an economy with *'N'* groups is defined as[18]

$$DSR_{i,t} = S_{i,t} * \left(\Delta S_{i,t} - \Delta 1/N \sum_{i=1}^{N} S_{i,t} \right)$$

Since the scope of a group is always positive, the sign of DSR depends on the deviation of change in the group's scope from the change in the average market scope. (i.e. the terms in the parenthesis). If a group expands more than the market or contracts less than the market or expands when the market contracts,

[18] See 'Measurement of scope dynamics' section for notation details

then the difference is positive and hence DSR is also positive. If a group expands less than the market or contracts more than the market or contracts when the market expands, then the difference is negative and hence DSR is also negative. Hypothesis-3 states that groups should benefit from being aggressive during market expansion and insensitive during market contractions. In other words, groups should lose when they are conservative during market expansion and sensitive to market contractions. The first part corresponds to a positive DSR and the second corresponds to a negative DSR. Therefore, we expect β_{1e} to be positive as per the above arguments. The inclusion of DSR also accounts for the non-linear relationship between firm performance and diversification. The scope and DSR variables are operationalised through Group HII for Model-BG4. Similar to Model-BG3, for all firms belonging to group *'i'*, the Group HII, Group CC and DSR variables are set equal to group *i's* HII, CC and DSR respectively each year.

E. Firm cost of capital regressions

Ordinary Least Squares (OLS) regression estimation is used for all cost of capital regressions. Monthly return data is used in these models. In the regression models, subscript *'j'* indicates a firm,*'i'* indicates a group and *'t'* indicates the time period (month). The following regression model is used to test Hypothesis-4 on the Institutional Voids Factor Model (IVFM)

$$\mathrm{R}_{j,t} - R_{f,t} = \alpha + b * (R_{m,t} - R_{f,t}) + s * SMB_t + h * HML_t + m * UMD_t + v * NMG_t + \varepsilon_{j,t} \quad (9)$$

Where[19],

$R_{j,t}$: Stock return for firm *'j'* for month *'t'*

$R_{f,t}$: Risk-free return for month *'t'*

$R_{m,t}$: Market return for month *'t'*

[19]See Table 5 for IVFM factor definitions and more details

SMB_t: Return of Small portfolio minus return of Big portfolio for month *'t'*

HML_t: Return of High portfolio minus return of Low portfolio for month *'t'*

UMD_t: Return of Up portfolio minus return of Down portfolio for month *'t'*

NMG_t: Return of Non-group portfolio minus return of Group portfolio for month *'t'*

b,s,h,m,v : Factor loadings on the corresponding 5 factors

As hypothesized earlier, the risk due to institutional voids is captured through the return spreads between standalone firms and business group affiliated firms (i.e. the NMG factor). If this is priced in the capital markets, the factor loading *'v'* should be positive and significant. Since the IVFM should be tested for the entire economy, the model is run on a sample of all firms.[20]

In order to test Hypothesis-5, a BG dummy is added to the IVFM and the following specification is run on a sub-sample of only group affiliated and standalone firms[21]. The BG dummy takes a value of 1 for group affiliated firms and 0 for standalone firms.

Model-R1:

$$\mathrm{R}_{j,t} - R_{f,t} = \alpha + b * (R_{m,t} - R_{f,t}) + s * SMB_t + h * HML_t + m * UMD_t + v * NMG_t + \beta_1 * BG\ dummy_j + \varepsilon_{j,t} \quad (10)$$

We expect β_1 to be negative reflecting the conjecture that the cost of capital for group affiliated firms is lower than for similar standalone firms. In addition, Model-R1 is run separately for Regime-1 and Regime-2 to test the reduction of the difference in the cost of capital of group affiliated and standalone firms.

[20] Indian BG and SA firms, government firms, foreign BG and SA firms etc.

[21] i.e. Government firms, foreign firms etc. are excluded

Two important aspects of group affiliation are the expropriation risk faced by minority shareholders through tunneling (Bertrand et al., 2002) and the protection offered to member firms through mutual insurance (Khanna and Yafeh, 2005). The cost of capital regressions enable us to test for both. The NMG factor can be interpreted as measuring the additional risk due to absence of mutual insurance. Groups provide mutual insurance to their member firms which can be valuable in an economy with institutional voids. Since mutual insurance is not available for SA firms, the coefficient on the NMG factor in Model-R1 should be greater than the corresponding coefficient in Models R2 to R4[22]. Having controlled for the mutual insurance effect, the BG dummy in Model-R1 also tests for the presence of tunneling. If the tunneling risk is priced in equity markets, the BG dummy should be positive indicating the higher risk of investing in BG firms vis-à-vis SA firms (after accounting for the mutual insurance effect). A negative BG dummy indicates the presence of other benefits from group affiliation which further reduce the risk of affiliated firms.

Hypothesis-6 postulates on the effect of group scope and scale on affiliated firm cost of capital. Since the IVFM is an asset pricing model, the inclusion of a scope or scale measure in the regression specification might not be appropriate. Hence we operationalise this by dividing groups into three terciles based on their scope and scale and insert dummy variables to indicate group scope and scale. Using HII values, the groups are divided into low scope, medium scope and high scope categories. Using group total assets values, the groups are divided into small size, medium size and big size categories. Models R2 and R3 separately capture the effect of group scope and group scale respectively.

Model-R2:

$$\mathrm{R}_{j,t} - R_{f,t} = \alpha + b * (R_{m,t} - R_{f,t}) + s * SMB_t + h * HML_t + m * UMD_t + v * NMG_t + \beta_{2a} *$$

[22]A higher NMG coefficient indicates higher risk. Model-R1 is run on both BG and SA firms; whereas Models R2 to R4 are run on only BG firms.

$medium\ scope\ dummy + \beta_{3a} * high\ scope\ dummy + \varepsilon_{j,t}$ (11)

Model-R3:

$\mathrm{R}_{j,t} - R_{f,t} = \alpha + b * (R_{m,t} - R_{f,t}) + s * SMB_t + h * HML_t + m * UMD_t + v * NMG_t + \beta_{2b} *$ $medium\ size\ dummy + \beta_{3b} * big\ size\ dummy + \varepsilon_{j,t}$ (12)

It is important to note that since both models are run on a sub-sample of only group affiliated firms, firms belonging to low scope and small size terciles form the reference set in Models R2 and R3 respectively. According to Hypothesis-6, which states that both group scope and scale reduce the cost of capital - β_{2a}, β_{3a}, β_{2b} and β_{3b} are all expected to be negative. Additionally, since increases in scope and scale are theorized to further lower the cost of capital, the absolute value of β_{3a} (β_{3b}) must be greater than the absolute value of β_{2a} (β_{2b}).

Model-R4 captures the scope and scale effect simultaneously. In order to achieve this, we need to consider firms in the intersection of the scope and scale categories. The usage of terciles will result in 9 categories and hence 8 dummy variables will have to be included in the model. To avoid such a large number of dummies, we divide groups into 2 parts: based on both scope and scale by using the respective medians as breakpoints. The intersection of these results in 4 categories and hence only 3 dummies will have to be included in the model[23]. Further, these categories help us to understand the effect of scope after controlling for scale and vice-versa. Model-R4 is specified below.

[23]The 4 categories are lower scope/smaller size, lower scope/bigger size, higher scope/smaller size and higher scope/bigger size. The lower scope/smaller size category is considered as the reference set.

Model-R4:

$$R_{j,t} - R_{f,t} = \alpha + b * (R_{m,t} - R_{f,t}) + s * SMB_t + h * HML_t + m * UMD_t + v * NMG_t$$
$$+ \beta_4 * lower\ scope/bigger\ size\ dummy + \beta_5 * higher\ scope/smaller\ size\ dummy$$
$$+ \beta_6 * higher\ scope/bigger\ size\ dummy + \varepsilon_{j,t} \quad (13)$$

The reference set is the *lower scope/smaller size* category. Firms belonging to groups in the lower scope/bigger size category will differ substantially from the reference set in only scale with their scope being roughly the same. Hence, this will help us to isolate the effect of scale on firm cost of capital. On the same lines, β_5 isolates the effect of scope on firm cost of capital. β_6 captures both scope and scale effects (because the firms in this category belong to groups that have a higher scope as well as larger scale compared to the reference set) and hence may not provide further insights.

III RESULTS

A. Univariate Analysis

The means and medians for various variables in the regression sample and the corresponding T-statistic (T-test for difference in means between BG and SA firms) and Z-statistic values (Mann-Whitney-Wilcoxon test for difference in distribution between BG and SA firms) are presented in Table 1. Table 1 indicates that business group firms are valued better than standalone firms as indicated by their statistically significant higher Q ratio (both mean and median). The difference is relatively higher in Regime-1 compared to Regime-2. The mean (median) Q for BG firms was higher by 16.0% (13.8%) in Regime-1 but was higher by only 5.5% (7.7%) in Regime-2. This result offers preliminary support for Hypothesis-1. BG firms are older, larger and have higher leverage relative to SA firms in both regimes. The T-statistic values indicate that apart from depreciation/sales ratio, the means of all variables are significantly higher (at the 1% level)

for BG firms in both regimes. The Z-statistic values indicate that apart from depreciation/sales ratio, the distributions of all variables are significantly different (at the 1%level) between BG and SA firms in both regimes. The BG mean of the depreciation/sales ratio (a proxy for growth opportunities) in Regime-1 is significantly lower than the SA mean but the medians are similar. However, both the T-statistic and the Z-statistic values indicate that there is no significant difference between the depreciation/ sales ratio of BG and SA firms in Regime-2. Further, the results indicate that BG firms enjoy greater monopoly power as evidenced by their statistically significant higher industry adjusted operating profit ratio (IAOP). In the next section, we extend our analysis, at the multivariate level, for drawing more meaningful inferences.

B. The value of group affiliation

The results for Model-M, aimed to capture the value of group affiliation, are presented in Table 2. The BG dummy is positive and highly significant in all the 3 periods (0.086 for all years, 0.099 for Regime-1 and 0.050 for Regime-2; $p<0.01$ for all) indicating that group affiliated firms perform better than standalone firms. This result is consistent with Khanna and Palepu (2000a). The estimated coefficient of the BG dummy in Regime-1 is substantially greater than the corresponding estimate in Regime-2. The estimated coefficient on the BG dummy is 12.2% higher than the mean Q for SA firms in Regime-1 whereas in Regime-2, it reduces to 6.0% of the mean Q for SA firms. There is a reduction of more than 50% in the BG dummy coefficient estimate for Regime-2 which indicates that the economic significance of affiliation value for BG firms relative to SA firms has declined over time with the reduction of institutional voids. Thus the results offer strong support for Hypothesis-1. In addition to this, Model-M was run on annual cross-sectional data (using Ordinary Least Squares method) for each year in the 20 year sample period. Figure-2 plots the estimated coefficient of the BG dummy for each of the 20 years along with a fitted linear time-trend. This chart pictorially represents the declining business group premium in the Indian economy over the last 2 decades[24].

[24]The reduction in the affiliation value for BG firms over 2 decades can also be driven by family successions (majority of business groups in India are family controlled). While studies find that family successions have a negative impact on firm performance (See Bennedsen et al., 2007 and references therein), a few studies on India business groups report that successions in Indian family groups enhance firm value (Marisetty et al., 2008; Talreja, 2007). Therefore, we believe that in the Indian context, the temporal decline in the affiliation value for BG firms is unlikely to be caused by family successions.

Table 3 presents the results of Models BG1 to BG3. These models aim to capture the differential impact of scale and scope on business group affiliated firms. The results of Model-BG1 indicate that group scope (diversification) has a positive and significant effect (coefficient estimate of 0.019 with $p<0.05$) on affiliated firm performance only in Regime-1. At the mean level, group scope has a positive impact of 3.5% on Q for BG firms[25,26]. The estimated coefficient in Model-BG2 results indicate that group scale (size) has a positive and significant effect on affiliated firm performance in both regimes (coefficient estimate of 0.003 with $p<0.01$ for both regimes). At the mean level, group scale has a positive impact of 1.7% on Q for BG firms in Regime-1 and 2.9% in Regime-2 - indicating that group scale is more important in Regime-2.[27] The results of Model-BG3 are interesting to analyse. When both scope and scale variables are included in the regression specification, the positive effect of group scale on affiliated firm value remains as before but the effect of group scope undergoes a dramatic change. Taken together, the results in Model-BG3 indicate that in Regime-1, the benefits of group affiliation were purely driven by group size with group scope having no effect. The benefits of group size (coefficient estimate of 0.004 with $p<0.01$) continue in Regime-2 as well but group scope (coefficient estimate of -0.031 with $p<0.01$) reduces affiliated firm value in Regime-2. At the mean level, group scale has a positive impact of 4.0% and group scope has a negative impact of 5.7% on Q for BG firms in Regime-2[28]. This indicates that diversification, over time, is a value destroying strategy as against a value enhancing strategy as proposed by Khanna and Palepu (1997, 2000a).

Based on qualitative descriptions of the Indian economy[29] , it is reasonable to state that institutional voids in India were lesser in Regime-2 relative to Regime-1. Model-BG3 results indicate that group size had a positive effect on affiliated firm value even as institutional voids decreased. However, group scope (which had no significant impact on affiliated firm value in Regime-1 when institutional voids were rela-

[25]For Regime-1, HII mean is 1.73 and Q mean for BG firms is 0.94. The product of the coefficient estimate on HII and HII mean is 0.019 * 1.73 = 0.0329. This is 3.5% of the Q mean for BG firms (0.0329 / 0.94).

[26]Alternatively, increasing HII by 1 standard deviation (sd) increases Q by 3.1% of a sd.

[27]Alternatively, increasing CC by 1 sd increases Q by 3.3% and 6.0% of a sd in the 2 regimes respectively.

[28]Alternatively, increasing CC by 1 sd increases Q by 8.4% of a sd and increasing HII by 1 sd decreases Q by 4.7% of a sd.

[29]Kali and Sarkar (2005) and Zattoni et al. (2009). See Appendix C also.

tively higher) had a negative impact on affiliated firm value as institutional voids decreased. It is important to note that in Model-BG1, the positive and significant coefficient on the scope variable (Group HII) in Regime-1 might be the size effect in disguise. In summary, the results support Hypothesis-2 and indicate that business group scale (scope) of operations have a positive (negative) effect on the value of business group affiliates. This is consistent with the meta-analytical results of Carney et al. (2011).

C. The structural dynamics of scope

The results of Model BG-4 with the Dynamic Scope Response (DSR) measure are presented in Table 4. Model-BG4 is the same as Model-BG3 except for the inclusion of the DSR measure[30]. The DSR measure is positive and significant in all the 3 periods (coefficient estimate of 0.026 with $p<0.01$ for all years, 0.022 with $p<0.10$ in Regime-1 and 0.024 with $p<0.05$ in Regime-2). At the mean level, DSR has a positive impact of 0.2% and 0.1% on Q for BG firms in Regime-1 and Regime-2 respectively[31]. This supports Hypothesis-4 which states that business groups benefit from being aggressive during market expansion and by being insensitive during market contractions[32]. Further, the coefficients on the scope and scale variables are not substantially affected by the inclusion of the DSR measure. These results also indicate that the positive effect of diversification found in earlier studies may be due to the omitted DSR effect and the failure to disentangle the scope and scale effects.

To ensure robustness of results to alternate measures, all regressions were replicated using market to book ratio instead of Q ratio, entropy measure of diversification[33] instead of HII, group total assets instead of group company count and research and development/sales ratio instead of depreciation/sales ratio. All results are qualitatively similar to the reported results.

[30] Additionally, we lose some observations as the DSR measure is not available for the year 1990 due to the calculation of the year on year change.

[31] Alternatively, increasing DSR by 1 sd increases Q by 1.8% and 1.6% of a sd in the 2 regimes respectively.

[32] As detailed in the Methodology section, DSR will be positive only in these cases.

[33] We use the Palepu (1985) method for calculating entropy value.

D. The effect of institutional voids risk

Table 5 details the definitions of the five factors used in the IVFM along with explanatory comments. Table 6 presents the descriptive statistics for the monthly IVFM factors. The first available monthly return is for Feb-1990 but since the UMD factor needs 6 prior monthly returns, the sample period starts from Aug-1990. The sample period spans 233 months (~20 years) from Aug-1990 to Dec-2009[34]. All factor portfolios are rebalanced every month and the weighted returns are calculated using market capitalisation weights and arithmetic stock returns.

Hypothesis-4 on the pricing of the institutional voids risk in capital markets is tested in Table 7 where the results of the Four Factor Model and the IVFM run on a sample of all firms are presented[35]. All factor loadings in both models are significant and positive. Additionally, the IVFM has a slightly higher adjusted R-square. This indicates that IVFM is a better fit than the Four Factor Model for Indian stock returns. The IVFM results indicate that the NMG factor is priced in the Indian capital markets (coefficient estimate of 0.268 with $p<0.01$) and investors indeed recognize the risk of operating in an institutional voids environment and factor it in the expected return calculations. Thus Hypothesis-4 finds strong support.

The results of Model-R1 for testing Hypothesis-5 are presented in Table 8. The BG dummy is significant and negative in both regimes (coefficient estimate of -0.015 in Regime-1 and -0.012 in Regime-2 with $p<0.01$ for both regimes) and in the overall period (coefficient estimate of -0.012 with $p<0.01$) indicating that the expected return or the cost of capital of group affiliated firms is lesser than that of standalone firms. The estimate of the BG dummy coefficient is less negative in Regime-2 indicating that group affiliated firms had a lesser cost of capital in Regime-1 relative to Regime-2. Further, the factor loading on NMG is substantially lower in Regime-2 (coefficient estimate of 0.446 in Regime-1 and 0.104 in Regime-2 both with $p<0.01$). At the mean level, the NMG factor increases the average excess return by 1.1 and 0.1 percentage points in Regime-1 and Regime-2 respectively. Since the NMG factor reflects

[34]The UMD factor could not be calculated for 30 months (mostly in the early 1990s) as either the Up or Down or both portfolios did not have any stocks for that month. Therefore, the UMD factor is available only for 203 months

[35]Indian BG and SA firms, government firms, foreign BG and SA firms etc.

the risk of operating in an institutional voids environment, the results indicate that the risk premium is lesser in Regime-2. These results support Hypothesis-5.

Table 9 presents the effect of group scope and scale on cost of capital. Models R2, R3 and R4 are run on a sub-sample of only group affiliated firms. Model-R2 captures the effect of scope and Model-R3 captures the effect of scale. Results of Model-R2 indicate that only firms affiliated to groups in the high scope category had a lower cost of capital compared to other affiliated firms. However, this effect is seen only in Regime-1 (coefficient estimate of -0.006 with $p<0.05$). Compared to the mean BG excess return in Regime-1, the cost of capital of firms belonging to groups in the high scope category was lesser by 79%. Results of Model-R3 indicate that group scale lowers the cost of capital of affiliated firms. There is a monotonic decrease in the firm cost of capital with increase in group scale (coefficient estimate of -0.011 and -0.012 for medium size and big size groups in Regime-1 with $p<0.01$ for both and -0.007 and -0.010 for medium size and big size groups in Regime-2 with $p<0.05$ and $p<0.01$ respectively). This effectis present in both regimes but is more pronounced in Regime-1. Further, the coefficient estimates on the size dummies are economically larger than the corresponding estimates on the scope dummies. Taken together, these results indicate that scale has a dominant effect on reducing the affiliated firms' cost of capital whereas scope has a very negligible effect.

Model-R4 provides further evidence in this direction. The reference set for Model-R4 is firms belonging to groups in the lower scope/smaller size category. The coefficient on lower scope/bigger size dummy is significant and negative in Regime-2 (-0.009 with $p<0.01$) indicating that scale reduces the affiliate cost of capital. The corresponding coefficient in Regime-1 is statistically insignificant but has the same sign. In contrast, the coefficient on higher scope/smaller size dummy is statistically insignificant in both regimes indicating that scope does not reduce the affiliate cost of capital. As stated before, the effect of scope and scale cannot be separated using the coefficient on the higher scope/bigger size dummy but since its coefficients are very similar to the coefficients on the lower scope/bigger size dummy in both regimes, we can state with reasonable assurance that this is probably due to the scale effect. Taken together, we can conclude that group scope has a negligible effect on affiliate cost of capital whereas group scale lowers

affiliate cost of capital. Thus Hypothesis-6 is partly supported.

Further, the significant and positive coefficient on the NMG factor indicates that mutual insurance is valuable in the Indian economy. The estimated NMG coefficient in Model-R1 is higher than corresponding estimates in Models R2 to R4 in all the 3 periods. This confirms the earlier conjecture that an average SA firm has a higher expected return as compared to an average BG firm on account of the NMG factor. In unreported tests, the IVFM was run separately on sub-samples of only SA firms and only BG firms. The estimated NMG coefficient for only SA firms was 0.424, 0.593 and 0.202 in the 3 periods respectively compared to 0.127, 0.247 and (.031) for only BG firms and was significant in all cases. This provides strong evidence that SA firms have a higher cost of capital due to the absence of mutual insurance benefits. Additionally, the BG dummy in Model-R1 is negative and significant: indicating simultaneously the absence of tunneling risk and the presence of additional risk-reducing benefits from group affiliation. These benefits can be due to groups' political power, monopoly power etc.

To ensure robustness, Models R1 to R4 were replicated using the four-factor model instead of the IVFM. Scope and size tercile and median categories for Models R2, R3 and R4 were calculated using the entropy measure and group company count respectively. In Model-R4, the reference set was changed to firms belonging to groups in the higher scope/bigger size category. All results are qualitatively similar to the reported results. In summary, the empirical results reported in this section supports all our stated hypotheses.

IV CONCLUSION

In light of Carney et al. (2011), we revisit the debate on business group strategic value to its affiliates to provide new insights to the existing literature. We provide a new framework to support Carney et al. (2011) contention that value gains of business group affiliation in emerging markets needs to be interpreted using a more holistic approach than looking from a mono-theoretic lens. Our framework helps to

resolve the conflicting evidence in the literature on the value effects of business group affiliation. We argue the benefits or losses of business group affiliation are mainly a tradeoff between diversification versus diversity effects. We show that business groups' strategic scope related changes aimed to exploit market conditions is the main differentiating factor attributed to group structural value. Business groups that expand aggressively during market expansions and contract less during market contractions gain value due to their structural advantages.

Our approach not only integrates merits of several existing theories but also attempts to complete the institutional voids theory proposed by Khanna and Palepu (1997, 2000a). We achieve this by first testing and confirming results based on several alternative theories on the performance of business group affiliates through 44,000 firm year observations of Indian market during 1990-2009. Second, using the same dataset, we show that diversification benefits of business groups are mainly driven by their scale of operations and not by their scope of operations as proposed by Khanna and Palepu (1997, 2000a). However, scope related benefits are a function of business groups' dynamic response to changing market conditions.

A lot more needs to be done in the area of business groups. Future research could focus on studying related and unrelated diversification strategies of groups in order to understand their individual impact on affiliated firm value. Analysis of the impact of intra and inter group ties on diversification strategies of groups might yield interesting insights - especially in economies with substantial institutional transitions. Holistic frameworks integrating several theories and dynamic studies over long periods of time are vital for furthering our understanding of this composite and widespread organizational form.

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Appendix A: Summary of selected Business Groups theories

Theory	Illustrative reference	Summary
Resource-based view	Guillen (2000)	Business Groups (BGs) have a superior capability for repeated industry entry enabled by quickly and effectively combining various resources.
Exchange theory	Keister (2001)	BGs adapt to economic transition by leveraging internal and external ties and alliances.
Institutional voids theory	Khanna and Palepu (1997)	BGs arise and flourish in economies with institutional voids as they are able to effectively fill such voids in capital, labour and product markets. However, the superior performance of group firms reduces with the reduction of such voids.
Transaction costs theory	Hoskisson et al. (2005)	Diversification strategies of BGs are influenced by external transaction costs (which reduce with diversification and with improvement in the environmental conditions) and internal organizational costs (which increase with diversification and organizational complexity)
Agency theory	Claessens et al. (2000)	Minority shareholders in BG firms are exposed to risk of expropriation by majority shareholders (also called the principal-principal problem)
Risk sharing theory	Khanna and Yafeh (2005)	BG firms "enable member firms to share risks by smoothing income flows and reallocating money from one affiliate to another".

Appendix B: List of variables and their definitions

Variable name	Variable definition
Panel A: Firm Characteristics	
Age	Number of years since incorporation of a firm.
Business Group (BG) dummy	A dummy variable taking a value of 1 for group affiliated firms and 0 for unaffiliated firms. Groups with less than 3 companies in a year are excluded from the sample for that year (Gopalan et al., 2007).
Depreciation to Sales	Ratio of firm's depreciation expense to its net total sales.Observations with zero and negative depreciation values are excluded.
Industry-adjusted operating profit ratio (IAOP)	Ratio of firm's operating profit to its net total sales minus the industry average. Industries are considered at the 2 digit NIC level. Industries with less than 5 firms and firms with operating profit of more than 100% or less than -100% are excluded from the sample for that year.
Leverage	Ratio of firm's total borrowings to total assets.
Market Capitalisation	Product of number of equity shares outstanding and market price per share of the firm (as on the last day of the firm's financial year).
Q ratio	[Market value of Equity + Book value of Preference shares + Book value of Debt] / Total Assets.

Variable name	Variable definition
Sales	Total sales of the firm. Observations with zero and negative values are excluded.
Panel B: Group level variables	
Dynamic scope response (DSR)	The product of a group's scope and the deviation of change in group's scope from the change in the average market scope. DSR for group 'i' at time 't' in an economy with 'N' groups is defined as $DSR_{i,t} = S_{i,t} * \left(\Delta S_{i,t} - \Delta 1/N \sum_{i=1}^{N} S_{i,t}\right)$
Group Company Count (CC)	The number of firms in a group (considering both listed and unlisted firms).
Group Herfindahl Index Inverse (HII)	The reciprocal of Herfindahl Index for a group. The Herfindahl Index for a group present in 'n' industries is defined as $\sum_{i=1}^{n}(P_i)^2$, where P_i is the proportion of industry 'i' group sales to total group sales. Industries are considered at the 2 digit NIC level. Group HII measures the extent of group diversification.
Scope dummies (low scope, medium scope and high scope)	Using HII values, groups are divided into 3 terciles and are named low scope (1^{st} tercile), medium scope (2^{nd} tercile) and high scope (3^{rd} tercile) categories. Low scope dummy takes a value of 1 for firms belonging to business groups in the low scope category and 0 for rest of the group affiliated firms. Similarly for medium scope and high scope dummies.
Scale (Size) dummies (small size, medium size and big size)	Using group total assets values, groups are divided into 3 terciles and are named small size (1^{st} tercile), medium size (2^{nd} tercile) and big size (3^{rd} tercile) categories. Small size dummy takes a value of 1 for firms belonging to business groups in the small size category

Variable name	Variable definition
	and 0 for rest of the group affiliated firms. Similarly for medium size and big size dummies.
Scope and Scale intersection dummies	Groups are divided into 2 partitions based on both scope and scale by using the respective medians as breakpoints (HII for scope and group total assets for scale). The intersection of these four partitions results in 4 categories i.e. lower scope/smaller size, lower scope/bigger size, higher scope/smaller size and higher scope/bigger size. To illustrate, lower scope/bigger size dummy takes a value of 1 for firms belonging to business groups in the intersection of the lower than median partition for scope and higher than median partition for scale and 0 for rest of the group affiliated firms. Similar logic applies for the other 3 intersection dummies.

Notes:

1. Data for all variables are from the Prowess database;
2. Variables are transformed into log forms by using natural logs;
3. See Table 5 for Institutional Voids Factor Model (IVFM) factor definitions;
4. Groups are assigned to tercile (median) categories each year. (i.e. for example, a group in tercile-1 in a year can move to tercile-3 in another year or a group in lower than median category in one year can move into higher than median category in another year). The annual terciles (medians) are calculated using a comprehensive database that has all Indian business groups considering both listed and unlisted firms. As before, groups with less than 3 companies are excluded.
5. Group total assets is a relatively continuous variable compared to group company count (which is discrete in nature). Therefore, the scale terciles (medians) are based on group total assets rather than group company count in order to ensure an even distribution especially among the three scale terciles.

Appendix C: Prominent institutional changes in the Indian economy

Markets	Year/Period	Reforms
Overall	1991	Start of liberalization reforms
Product	1991	Licensing requirements abolished except for very few industries
Capital	1992	SEBI established; Office of the Controller of Capital Issues abolished. Companies free to price their primary offerings
Capital	1993	Foreign Institutional Investors allowed to invest in Indian stock markets
Overall	1994	Rupee became officially convertible on current account
Capital	1994	Electronic trading established; National Stock Exchange (NSE) started operations. Banking sector opened up for new private banks
Product	Mid 1990s	Relaxation of import policy and reduction in peak tariff rates
Capital	1996	SEBI empowered to regulate all capital market intermediaries
Capital	1996	First formal Corporate Governance committee established
Capital/Product	1997	Implementation of takeover code for corporate control
Overall	1998	Substantial reduction in income tax rates
Capital	1990s	Relaxation of rules governing Foreign Direct Investment
Capital	2000	Insurance sector opened up for non-state players
Product	2001	Removal of quantitative restrictions on imports of manufactured consumer goods and agricultural products
Capital	2000-01	Introduction of derivatives trading on Indian stock exchanges
Product	2003	Reforms in product market competition through new competition act
Labour	2003	Establishment of Pension Fund Regulatory and Development Authority
Capital	Early 2000s	Corporate Governance reforms
Product	Early 2000s	De-reservation of many products reserved for small scale sector
Product/Labour	Early 2000s	Acceleration in disinvestment program

Sources : Zattoni et al. (2009), Kali and Sarkar (2005), Black and Khanna (2007) and Ahluwalia (2002)

Appendix D: A simple model on the scope dynamics of business groups

Definition of a Business Group

In our model, a business group is defined as a network of many firms that have a common controlling shareholder *(CS)* with several minority shareholders *(MS)* who are different in each of the affiliated firms. *CS* approaches MS mainly to increase group scope (as scale related dynamics are quite linear, we ignore scale in this setting. Introduction of scale will not alter our results). The group structure is set up mainly to exploit the environmental conditions (institutional voids setting) and hence how group structure changes with changing market conditions is important for affiliates' value. Also, *CS* can exercise control directly or indirectly either through cash flow or voting rights. Hence, the incentives to expropriate are higher for *CS*.

The Model

We model the decisions of CS and MS as a strategic game in a game theory framework. Thus, in a game theory setting, *CS* has two strategies with respect to group scope: changing the scope in response to expected market conditions (beneficial to *MS*) and changing the scope ignoring expected market conditions (detrimental to *MS*). *MS* can either invest or not invest in group affiliated firms. If *MS* do not invest in group affiliated firms, we assume that they invest in a similar risky project in the same economy. We define x as the probability of the *CS* changing the scope in response to expected market conditions (in short, "Respond to market conditions") and $1\text{-}x$ as the probability of *CS* changing the scope ignoring expected market conditions (in short, "Ignore market conditions"). Similarly, y and $1\text{-}y$ is the probability of *MS* investing and not investing in group affiliated firms respectively.

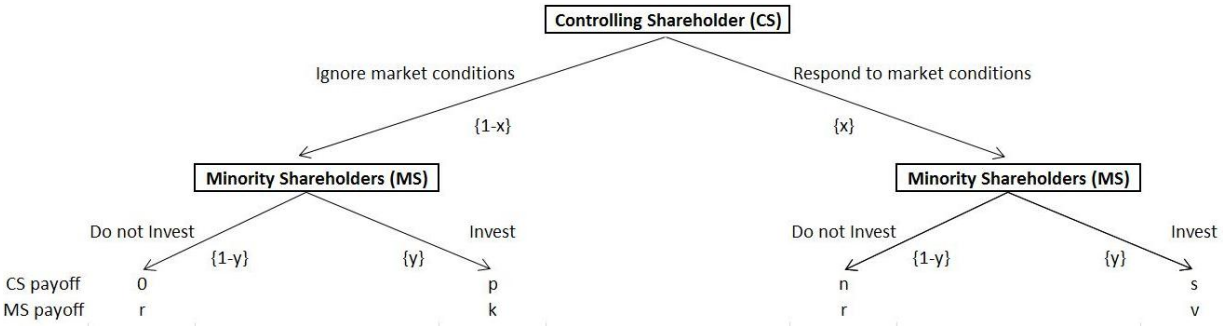
Payoffs:

When *CS* responds to market conditions and *MS* invest, *CS* gets a payoff s and *MS* get a payoff v. If *MS* do not invest, then *CS* gets n and *MS* get r by investing in a similar risky project in the same economy. s can be interpreted as the sum total of the legitimate benefits derived by *CS* from the group structure. This includes benefits such as reputational capital, internal capital, labour and product market benefits and other spillover effects. If *MS* do not invest, then *CS* gets n which is lesser than s. In this case, the

lower payoff to *CS* is on account of possible underinvestment or on account of sacrificing a few positive NPV projects due to lack of capital. Additionally, the *CS* will have to tap alternate sources of capital which might be costlier. In an economy with institutional voids, it is reasonable to assume that r is less than *v*. This is supported by empirical evidence in the extant literature as well as in this study that group affiliated firms perform better than standalone firms . For instance, co-insurance mechanism of business group affiliation is an obvious relative benefit. *v - r* is the benefit of group affiliation to *MS*.

When *CS* ignores market conditions and *MS* invest, *CS* gets a payoff *p* and *MS* get a payoff *k*. *p* is the payoff to *CS* when private benefits of control are encashed and is higher than s. However, due to this expropriation (through tunneling, empire building etc.), *MS* get a payoff of only *k* which is lesser than *r*. Here, *r - k* is the loss to *MS* due to group affiliation. If *MS* do not invest, then CS does not get any payoff and MS get r. In this case, the intention of the *CS* is to encash private benefits of control and when *MS* do not invest, the *CS* does not execute the project as he is unable to expropriate and hence the payoff is zero. As before, *MS* invest in a similar risky project in the same economy and obtain *r*.

The model is illustrated below. The possible payoffs to the *CS* and *MS* are given in the first and second lines respectively at the bottom of the figure as well as in a payoff matrix.



Conditions/Assumptions

- $p > s > n$
- $v > r > k$

Payoff Matrix (CS payoff first)

	Invest	**Do not Invest**
Respond to market conditions	*s,v*	*n,r*
Ignore market conditions	*p,k*	*0,r*

Equilibrium conditions:

At the equilibrium level of response, the gain for *MS* from investing in group firms when the *CS* responds to market conditions should be equal to the loss of investing in group firms when the *CS* ignores market conditions. This can be expressed as

$$(v\text{-}r)x = (r\text{-}k)(1\text{-}x) \implies x = (r\text{-}k)/(v\text{-}k) \quad \text{Eq.(A.1)}$$

At the equilibrium level of *MS* investment, the gain for *CS* from ignoring market conditions when *MS* invest should be equal to the loss from ignoring market conditions when *MS* do not invest. This can be expressed as

$$(p\text{-}s)y = (n\text{-}0)(1\text{-}y) \implies y = n/(n+p\text{-}s) \quad \text{Eq.(A.2)}$$

Our model[36] predicts that x increases with r and k and decreases with v i.e., the probability of the *CS* responding to market conditions increases with the payoff to *MS* from a similar risky project in the same economy and with the payoff to *MS* in the presence of expropriation and decreases with the payoff to *MS* in the absence of expropriation. The model[37] also predicts that y increases with s and n and decreases with p. This implies that the probability of *MS* investing in group firms increases with the payoff to *CS* from responding to market conditions (both when *MS* invest and do not invest) and decreases with the payoff to *CS* when private benefits of control are encashed. The expected payoff for *CS* and *MS* is yp and r respectively[38]. The expected payoff for *CS* increases with both the probability of *MS* investing in group firms *(y)* and the payoff to *CS* when private benefits of control are encashed *(p)*. However, it is important to note that y and p have an inverse relationship. The expected payoff for *MS* is the payoff from investing in a similar risky project in the same economy (i.e. a value exogenous to the model). These predictions are

[36] Eq.(A.1)
[37] Eq.(A.2)
[38] This is obtained my multiplying all the possible payoffs with the respective probabilities

in line with intuitive expectations. Thus, our model highlights the relationship between expected payoff and scope dynamics of business groups. However, our model suffers with several limitations that arise due to complex interactions of other possible components of business group affiliation costs and benefits.

Figure 2: Institutional voids over time

The chart plots the estimated coefficient of the BG dummy from Model-M (See Table 2) run on annual cross-sectional data (using Ordinary Least Squares method) for each year in the 20 year sample period (1990 to 2009). The dotted line is a linear time-trend fitted on the values of the 20 estimated coefficients.

Table 1: Descriptive Statistics of Business Groups Affiliate Firms and Standalone Firms

Variable name	Panel A: All years (1990 to 2009)				Panel B: Regime 1 (1990 to 1999)				Panel C: Regime 2 (2000 to 2009)			
	All Firms	BG Firms	SA Firms		All Firms	BG Firms	SA Firms		All Firms	BG Firms	SA Firms	
Number of firms	4734	1375	3359		3982	1120	2862		3884	1141	2743	
Number of Groups		438				355				400		
		Means		**T-stat**		**Means**		**T-stat**		**Means**		**T-stat**
Q-Ratio	0.85	0.91	0.82	16.53	0.85	0.94	0.81	18.49	0.85	0.88	0.83	6.46
Firm Age (Years)	22.19	30.17	18.36	68.61	19.15	27.00	14.97	46.27	24.47	32.88	20.75	54.06
Firm Sales (in Rs. Crores)	187.96	450.67	55.39	24.02	86.63	196.87	25.81	35.77	266.56	669.59	77.13	20.27
Firm Total Assets (in Rs. Crores)	239.30	610.00	61.15	25.22	117.13	283.60	28.22	28.92	331.94	890.95	84.63	21.16
Market Capitalization (in Rs. Crores)	159.26	433.25	28.05	15.09	57.44	146.29	10.13	23.61	235.77	678.06	40.71	13.42
Firm Depreciation/Sales	0.35	0.34	0.36	0.24	0.16	0.09	0.19	3.36	0.51	0.56	0.48	0.70
Firm Leverage	0.42	0.44	0.41	10.31	0.40	0.44	0.38	13.83	0.44	0.45	0.43	4.42
Firm IAOP	0.09	1.56	(0.68)	11.25	(0.13)	1.69	(1.16)	9.91	0.26	1.44	(0.31)	6.38
Group Herfindahl Index Inverse (HII)		1.67				1.73				1.62		
Group Company Count (CC)		7.63				6.30				8.62		
		Medians		**Z-stat**		**Medians**		**Z-stat**		**Medians**		**Z-stat**
Q-Ratio	0.71	0.76	0.69	20.84	0.74	0.80	0.71	18.98	0.69	0.73	0.68	11.12
Firm Age (Years)	17.00	24.00	15.00	65.73	13.00	20.00	11.00	48.09	19.00	26.00	17.00	52.72
Firm Sales (in Rs. Crores)	26.28	101.52	14.56	93.81	20.49	67.47	11.88	67.90	34.16	148.05	18.22	69.04
Firm Total Assets (in Rs. Crores)	28.24	117.32	17.31	104.40	23.05	77.29	14.98	72.66	35.26	176.81	20.03	78.81
Market Capitalization (in Rs. Crores)	6.46	28.13	4.10	90.87	6.53	23.71	4.12	66.18	6.38	33.75	4.08	64.23
Firm Depreciation/Sales	0.04	0.04	0.04	2.79	0.03	0.03	0.03	3.44	0.04	0.04	0.04	0.47
Firm Leverage	0.37	0.40	0.35	21.66	0.38	0.41	0.35	18.71	0.36	0.39	0.34	12.72
Firm IAOP	1.82	2.61	1.34	12.48	2.03	2.82	1.47	9.20	1.65	2.45	1.24	8.41
Group Herfindahl Index Inverse (HII)		1.41				1.54				1.34		
Group Company Count (CC)		5.00				4.00				5.00		

This table presents means and medians for the regression sample. The data is presented separately for All firms (i.e. group affiliated and unaffiliated firms), business group (BG) firms and standalone (SA) firms for all years and 2 regimes separately. Q ratio is [Market value of Equity + Book value of Preference shares + Book value of Debt] / Total Assets, Firm Age is the number of years since incorporation of the firm, Firm Sales is the net total sales of the firm, Firm Total Assets is the total assets of the firm, Market Capitalisation is the product of number of equity shares outstanding and market price per share of the firm, Firm Depreciation/Sales is the ratio of firm's depreciation expense to its net total sales and Firm Leverage is the ratio of firm's total borrowings to total assets. The aforementioned variables are defined for both BG and SA firms. Q ratio and Market Capitalisation are as at the end of the firm's financial year. In all cases, observations with zero and negative values are excluded. Group Herfindahl Index Inverse (HII) and Group Company Count (CC) are defined for only groups. Group HII measures the extent of group diversification and is the reciprocal of the Herfindahl Index for a group. Group CC measures the group size and is equal to the number of firms in a group (considering both listed and unlisted firms). The T-statistics are for the T-test for difference in means and the Z-statistics are for the Mann-Whitney-Wilcoxon test for difference in distribution between BG and SA firms.

Table 2: Panel regression results: Model-M

Variable name	All years	Regime 1	Regime 2
	1990-2009	1990-1999	2000-2009
	M	M	M
BG Dummy	0.086***	0.099***	0.050***
	[7.29]	[7.40]	[3.45]
Firm Sales (log)	(0.003)	(0.016) ***	0.012***
	[-1.29]	[-4.54]	[4.10]
Firm Depr / Sales	(0.000)	0.002	0.001
	[-0.43]	[0.35]	[0.72]
Firm Leverage	0.742***	0.627***	0.752***
	[85.05]	[32.65]	[68.22]
Firm Age (log)	(0.098) ***	(0.064) ***	(0.072) ***
	[-13.83]	[-7.88]	[-6.78]
Firm IAOP	0.001***	0.001***	0.001***
	[11.20]	[6.82]	[5.29]
Constant	0.801***	0.795***	0.591***
	[33.24]	[30.98]	[18.01]
Chi-square	19,041	7,406	10,965
No. of observations	36,918	16,391	20,527
p-value	0.00	0.00	0.00
rho	0.45	0.48	0.52

This table presents the results of Random Effects Generalized Least Squares (GLS-RE) panel estimation for Model-M. The dependent variable is the Q ratio and the regression is run on the sample of group affiliated and unaffiliated firms. Q ratio is [Market value of Equity + Book value of Preference shares + Book value of Debt] / Total Assets, The business group (BG) dummy takes a value of 1 for group affiliated firms and 0 for unaffiliated firms, Firm Sales is the net total sales of the firm, Firm Depreciation/Sales (Depr / Sales) is the ratio of firm's depreciation expense to its net total sales, Firm Leverage is the ratio of firm's total borrowings to total assets and Firm Age is the number of years since incorporation of the firm. Firm Sales and Firm Age are transformed into natural log forms on account of their wide dispersion and to control for possible heteroskedasticity. The results are presented for all years and the two regimes separately. Industry and year dummies are included in all regressions. T-statistics presented in brackets are based on robust standard errors to correct for heteroskedasticity. *p<0.10 ; **p<0.05 ; ***p<0.01.

Table 3: Panel regression results: Models BG1, BG2 and BG3

Variable name	Panel A: All years (1990 to 2009)			Panel B: Regime 1 (1990 to 1999)			Panel C: Regime 2 (2000 to 2009)		
	BG1	**BG2**	**BG3**	**BG1**	**BG2**	**BG3**	**BG1**	**BG2**	**BG3**
Group Herfindahl Index Inverse (HII)	0.008		(0.016)**	0.019**		(0.000)	0.010		(0.031)***
	[1.30]		[-2.37]	[2.28]		[-0.01]	[1.31]		[-3.55]
Group Company Count (CC)		0.002***	0.003***		0.003***	0.003***		0.003***	0.004***
		[5.41]	[5.73]		[3.47]	[2.83]		[5.20]	[6.07]
Firm Sales (log)	0.016***	0.014 ***	0.015***	0.006	0.006	0.006	0.035***	0.032***	0.032***
	[3.81]	[3.48]	[3.58]	[0.81]	[0.80]	[0.81]	[6.61]	[6.08]	[6.11]
Firm Depr / Sales	0.002*	0.002	0.002	0.029*	0.027	0.027	0.002**	0.002**	0.002**
	[1.68]	[1.52]	[1.52]	[1.76]	[1.63]	[1.63]	[2.35]	[2.09]	[2.11]
Firm Leverage	0.676***	0.679***	0.679***	0.572***	0.573***	0.573***	0.680***	0.681***	0.680***
	[39.47]	[39.85]	[39.87]	[15.30]	[15.39]	[15.40]	[30.44]	[30.66]	[30.59]
Firm Age (log)	(0.056)***	(0.058)***	(0.056)***	(0.038)**	(0.040)***	(0.040)***	(0.023)	(0.033)**	(0.030)*
	[-4.81]	[-5.00]	[-4.87]	[-2.56]	[-2.69]	[-2.69]	[-1.47]	[-2.06]	[-1.91]
Firm IAOP	0.002***	0.002***	0.002***	0.001***	0.001***	0.001***	0.002***	0.002***	0.002***
	[8.04]	[8.05]	[8.01]	[3.54]	[3.47]	[3.48]	[5.40]	[5.49]	[5.47]
Constant	0.737***	0.756***	0.779***	0.754***	0.785***	0.785***	0.342***	0.372***	0.411***
	[16.50]	[17.35]	[17.34]	[13.72]	[14.80]	[14.12]	[5.89]	[6.44]	[7.07]
Chi-square	7,452	7,573	7,586	3,143	3,190	3,193	4,196	4,279	4,288
No. of observations	12,832	12,832	12,832	6,054	6,054	6,054	6,778	6,778	6,778
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
rho	0.41	0.41	0.41	0.46	0.46	0.46	0.47	0.47	0.47

This table presents the results of Random Effects Generalized Least Squares (GLS-RE) panel estimation for 3 Models. The dependent variable is the Q ratio and all the regressions are run on a sub-sample of only group affiliated firms. Q ratio is [Market value of Equity + Book value of Preference shares + Book value of Debt] / Total Assets, Firm Sales is the net total sales of the firm, Firm Depreciation/Sales (Depr / Sales) is the ratio of firm's depreciation expense to its net total sales, Firm Leverage is the ratio of firm's total borrowings to total assets and Firm Age is the number of years since incorporation of the firm. Firm Sales and Firm Age are transformed into natural log forms on account of their wide dispersion and to control for possible heteroskedasticity. Group HII measures the extent of group diversification and is the reciprocal of the Herfindahl Index for a group. The Herfindahl Index for a group present in 'n' industries is defined as $\sum_{i=1}^{n}(P_i)^2$, where Pi is the proportion of industry 'i' group sales to total group sales. Industries are considered at the 2 digit NIC level. Group CC measures the group size and is equal to the number of firms in a group (considering both listed and unlisted firms). For all firms belonging to group 'i', Group HII and Group CC variables are set equal to group i's HII and CC respectively each year. The results are presented for all years and the two regimes separately. Industry and year dummies are included in all regressions. T-statistics presented in brackets are based on robust standard errors to correct for heteroskedasticity. *p<0.10; **p<0.05; ***p<0.01.

Table 4: Panel regression results: Model-BG4

Variable name	All years 1990-2009 BG4	Regime 1 1990-1999 BG4	Regime 2 2000-2009 BG4
Group Herfindahl Index Inverse (HII)	(0.027)***	(0.013)	(0.038)***
	[-3.54]	[-1.08]	[-4.02]
Group Company Count (CC)	0.003***	0.003***	0.004***
	[5.92]	[3.05]	[6.18]
Dynamic scope response (DSR)	0.026***	0.022*	0.024**
	[2.84]	[1.68]	[2.10]
Firm Sales (log)	0.014***	0.001	0.032***
	[3.26]	[0.16]	[6.03]
Firm Depr / Sales	0.002	0.023	0.002**
	[1.48]	[1.44]	[2.10]
Firm Leverage	0.673***	0.570***	0.672***
	[37.91]	[14.28]	[29.43]
Firm Age (log)	(0.049)***	(0.031)*	(0.027)*
	[-4.13]	[-1.93]	[-1.69]
Firm IAOP	0.002***	0.002***	0.002***
	[7.85]	[3.48]	[5.39]
Constant	1.392***	0.851***	0.411***
	[26.97]	[14.56]	[6.97]
Chi-square	7,196	2,992	4,116
No. of observations	11,899	5,345	6,554
p-value	0.00	0.00	0.00
rho	0.42	0.49	0.47

This table presents the results of Random Effects Generalized Least Squares (GLS-RE) panel estimation for Model-BG4. The dependent variable is the Q ratio and all the regressions are run on a sub-sample of only group affiliated firms. Q ratio is [Market value of Equity + Book value of Preference shares + Book value of Debt] / Total Assets, Firm Sales is the net total sales of the firm, Firm Depreciation/Sales (Depr / Sales) is the ratio of firm's depreciation expense to its net total sales, Firm Leverage is the ratio of firm's total borrowings to total assets and Firm Age is the number of years since incorporation of the firm. Firm Sales and Firm Age are transformed into natural log forms on account of their wide dispersion and to control for possible heteroskedasticity. Group HII measures the extent of group diversification and is the reciprocal of the Herfindahl Index for a group. The Herfindahl Index for a group present in 'n' industries is defined as $\sum_{i=1}^{n}(P_i)^2$, where Pi is the proportion of industry 'i' group sales to total group sales. Industries are considered at the 2 digit NIC level. Group CC measures the group size and is equal to the number of firms in a group (considering both listed and unlisted firms). The Dynamic scope response (DSR) is the product of a group's scope and the deviation of change in group's scope from the change in the average market scope. For all firms belonging to group 'i', Group HII, Group CC and DSR variables are set equal to group i's HII, CC and DSR respectively each year. The results are presented for all years and the two regimes separately. Industry and year dummies are included in all regressions. T-statistics presented in brackets are based on robust standard errors to correct for heteroskedasticity. *p<0.10 ; **p<0.05 ; ***p<0.01.

Table 5: Institutional Voids Factor Model (IVFM) factor definitions

Factor name	Definition	Comments
Excess Market Return - ERM (Market factor)	Market return minus risk free return	Market return is proxied by BSE-100 returns. "Annual (Gross) Redemption Yield of Government of India Securities - Short term (1 to 5 years)" is considered as the risk free return.
Small minus Big - SMB (Size factor)	Weighted portfolio return of small sized stocks minus weighted portfolio return of big sized stocks	Stocks belonging to the bottom/top market capitalisation decile form the small/big portfolio.
High minus Low - HML (Distress factor)	Weighted portfolio return of stocks with high book-to-market ratio (BMR) minus weighted portfolio return of stocks with low BMR	Stocks belonging to the bottom/top BMR decile form the low/high portfolio. Observations with negative BMR have been excluded. Following Fama and French (1992,1993), networth for month 't' is the latest available networth (taken from financial results which are for a period ending atleast 6 months prior to month 't').
Up minus Down - UMD (Momentum factor)	Weighted portfolio return of stocks with positive momentum minus weighted portfolio return of stocks with negative momentum	Stocks with six consecutive prior positive returns constitute the up portfolio and stocks with three consecutive prior negative returns constitute the down portfolio.
Non-Group minus Group - NMG (IV factor)	Weighted portfolio return of non-group firms minus weighted portfolio return of group firms	Stocks of firms affiliated to business groups form the group portfolio and stocks of unaffiliated firms form the non-group portfolio.

This table presents the definitions of the five factors used in the IVFM along with explanatory comments. BSE-100 values were taken from the Bombay Stock Exchange (BSE) website (www.bseindia.com) and risk free rates were taken from Reserve Bank of India (RBI) website (http://dbie.rbi.org.in/)

Table 6: Descriptive Statistics for Institutional Voids Factor Model (IVFM) factors

	All years (1990 to 2009)		**Regime 1 (1990 to 1999)**		**Regime 2 (2000 to 2009)**	
Number of Months	233		113		120	
Factor	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
ERM	0.83	1.12	0.84	0.20	0.82	1.52
HML	(5.44)	(6.75)	(7.43)	(8.49)	(3.56)	(3.69)
SMB	(3.00)	(3.73)	(4.59)	(5.26)	(1.50)	(1.71)
UMD	0.50	1.35	(0.60)	1.81	1.36	0.79
NMG	1.44	1.21	2.42	1.39	0.51	1.02

This table presents descriptive statistics for the IVFM monthly factors in percentage. ERM (Excess Market Return) is the market factor, HML (High Minus Low) is the distress factor, SMB (Small Minus Big) is the size factor, UMD (Up Minus Down) is the momentum factor and NMG (Non-group Minus Groups) is the Institutional Voids factor. The data is presented for all years and the two regimes separately.

Table 7: Regression Results Based on Asset Pricing Models

Variable name	Four Factor Model	IVFM
Intercept	0.037***	0.034***
	[69.97]	[61.81]
ERM	1.153***	1.148***
	[224.15]	[223.19]
HML	0.150***	0.195***
	[25.53]	[32.10])
SMB	0.470***	0.4000***
	[94.21]	[72.30]
UMD	0.029***	0.041***
	[11.01]	[15.46]
NMG		0.268***
		[28.88]
Adjusted R-Square	0.166	0.168
No. of Observations	399,940	399,940
F-Stat	19,880	16,104
p-value	0.00	0.00

This table presents the results of the Four Factor and the Institutional Voids Factor Model (IVFM) results based on Ordinary Least Squares estimation. The regressions are run on a sample of all firms in the Indian economy. The dependent variable is stock excess returns (monthly stock return minus monthly risk free rate). ERM (Excess Market Return) is the market factor, HML (High Minus Low) is the distress factor, SMB (Small Minus Big) is the size factor, UMD (Up Minus Down) is the momentum factor and NMG (Non-group Minus Groups) is the Institutional Voids factor. T-statistics are presented in brackets. *p<0.10; **p<0.05; ***p<0.01.

Table 8: Regression Results based on Model- R1

Variable name	All years 1990-2009 R1	Regime 1 1990-1999 R1	Regime 2 2000-2009 R1
Intercept	0.039***	0.035***	0.041***
	[50.13]	[25.33]	[40.57]
ERM	1.167***	1.115***	1.171***
	[190.67]	[116.27]	[141.05]
HML	0.175***	0.139***	0.210***
	[24.33]	[11.45]	[22.91]
SMB	0.444***	0.470***	0.421***
	[68.06]	[40.78]	[51.81]
UMD	0.045***	(0.013)*	0.047***
	[14.46]	[-1.78]	[13.11]
NMG	0.293***	0.446***	0.104***
	[26.45]	[26.67]	[6.08]
BG Dummy	(0.012)***	(0.015)***	(0.012)***
	[-10.83]	[-8.51]	[-7.73]
Adjusted R-Square	0.161	0.161	0.161
No. of Observations	318,091	127,972	190,119
F-Stat	10,169	4,102	6,080
p-value	0.00	0.00	0.00

This table presents the results for Model-R1 based on Ordinary Least Squares estimation. The regressions are run on a sub-sample of only group affiliated and unaffiliated firms. The dependent variable is stock excess returns (monthly stock return minus monthly risk free rate). ERM (Excess Market Return) is the market factor, HML (High Minus Low) is the distress factor, SMB (Small Minus Big) is the size factor, UMD (Up Minus Down) is the momentum factor and NMG (Non-group Minus Groups) is the Institutional Voids factor. The business group (BG) dummy takes a value of 1 for group affiliated firms and 0 for unaffiliated firms. T-statistics are presented in brackets. The results are presented for all years and the two regimes separately. *p<0.10 ; **p<0.05 ; ***p<0.01.

Table 9: Regression Results of Models R2, R3 and R4

Variable name	Panel A: All years (1990 to 2009)			Panel B: Regime 1 (1990 to 1999)			Panel C: Regime 2 (2000 to 2009)		
	R2	R3	R4	R2	R3	R4	R2	R3	R4
Intercept	0.034***	0.041***	0.039***	0.032***	0.038***	0.032***	0.033***	0.041***	0.040***
	[22.26]	[25.33]	[22.66]	[12.78]	[14.31]	[11.62]	[16.36]	[19.40]	[18.43]
ERM	1.109***	1.108***	1.108***	1.058***	1.058***	1.058***	1.114***	1.114***	1.113***
	[157.66]	[157.64]	[157.65]	[93.75]	[93.76]	[93.75]	[118.73]	[118.69]	[118.69]
HML	0.328***	0.329***	0.328***	0.281***	0.281***	0.281***	0.366***	0.366***	0.366***
	[39.39]	[39.44]	[39.42]	[19.32]	[19.31]	[19.32]	[35.39]	[35.44]	[35.44]
SMB	0.224***	0.223***	0.224***	0.240***	0.240***	0.240***	0.206***	0.205***	0.205***
	[29.52]	[29.51]	[29.51]	[17.40]	[17.40]	[17.40]	[22.54]	[22.51]	[22.51]
UMD	0.027***	0.027***	0.027***	(0.041)***	(0.041)***	(0.041)***	0.034***	0.034***	0.034***
	[7.20]	[7.19]	[7.20]	[-4.58]	[-4.60]	[-4.58]	[8.30]	[8.30]	[8.31]
NMG	0.126***	0.126***	0.126***	0.247***	0.247***	0.247***	(0.031)*	(0.032)*	(0.031)*
	[10.13]	[10.12]	[10.13]	[12.55]	[12.57]	[12.55]	[-1.69]	[-1.71]	[-1.70]
Medium Scope Dummy	0.000			(0.003)			0.003		
	[0.25]			[-0.92]			[1.29]		
High Scope Dummy	(0.003)*			(0.006)**			(0.000)		
	[-1.65]			[-2.12]			[-0.19]		
Medium Size Dummy		(0.008)***			(0.011)***			(0.007)***	
		[-4.15]			[-3.48]			[-2.50]	
Big Size Dummy		(0.011)***			(0.012)***			(0.010)***	
		[-6.07]			[-4.29]			[-4.35]	
Lower Scope/ Bigger Size Dummy			(0.007)***			(0.005)			0.007***
			[-2.98]			[-1.32]			[-2.98]
Higher Scope/ Smaller Size Dummy			(0.000)			(0.002)			0.000
			[-0.20]			[-0.44]			[0.10]
Higher Scope/ Bigger Size Dummy			(0.008)***			(0.006)***			(0.010)***
			[-4.32]			[-2.00]			[-4.00]
Adjusted R-Sqaure	0.228	0.228	0.228	0.207	0.207	0.207	0.245	0.245	0.245
No. of Observations	127,517	127,517	127,517	51,995	51,995	51,995	75,522	75,522	75,522
F-Stat	5,386	5,391	4,716	1,937	1,940	1,695	3,500	3,503	3,067
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

This table presents the results for Models R2, R3 and R4 based on Ordinary Least Squares estimation. The regressions are run on a sub-sample of only group affiliated firms. The dummies for different categories take a value of 1 for firms affiliated to groups belonging to that category and 0 for the rest of the firms. See Appendix B for definitions of the dummy variables and for more details. T-statistics are presented in brackets. The results are presented for all years and the two regimes separately. *p<0.10 ; **p<0.05 ; ***p<0.01.