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Abstract

In seeking to understand whether the transition by Asian countries to market economies mirrors the path taken by the West, we ask how embedded network ties between equity analysts and the CEOs of the firms they follow in India influence the accuracy of analysts' earnings forecasts. We contrast traditional institutions of caste and regional language with contemporary institutions such as universities as the locus for such ties. We posit that CEOs from the post-economic-reform generation in India are more likely to transfer material private information via their school ties while pre-reform generation CEOs favor caste or language ties. We then contrast domestic business groups (BGs) with western MNCs as organizational contexts and argue that BGs legitimate the transfer of private information along particularistic ties, whereas MNCs mitigate such transfers. Our conceptual framework is supported by analyses that draw on a sample of 1,552 earnings forecasts issued from 2001 to 2010 by 296 equity analysts. Our findings suggest that the embeddedness perspective should be broadened to incorporate the influence of larger historical social structures within which economic action is embedded, and to view BGs as carriers and repositories that blend modern management practices with particularistic behavioral patterns among top executives.

Abstracting from the industrialization of Great Britain, Polanyi (1944) posited that the defining feature of modernization was the dis-embeddedness or separation of social and economic relations, with the latter characterized by exchanges between impersonal, cool, instrumental atomistic actors devoid of social attachment. Conversely, the embeddedness perspective (Granovetter, 1985; Uzzi, 1997) suggests that even in the contemporary market economies of the West, economic action is underpinned by social relations rather than occurring in a vacuum. A rich stream of research set in Western market societies has since provided evidence of how individuals' embeddedness in social networks influences such diverse economic actions such as entrepreneurial success (Uzzi, 1996), mutual learning between banks and their clients (Uzzi & Lancaster, 2003), adaptation by hotel managers to customer needs (Ingram & Roberts, 2000), participation in private equity co-investment syndicates (Rider, 2012) and the financial performance of owner-centric small enterprises (Uzzi & Gillespie, 2002).

However, while the above research has generated considerable insight on how economic activity, as practiced in contemporary Western society, is underpinned by concrete on-going social relations, the *normative* ideal, drawn from influential neo-classical economic theory, is a market economy where transactions are defined not by social obligations or kinship ties but by rational calculation of individual gain by the transacting parties. Deviations from this normative ideal – such as those documented by embeddedness scholars – are seen as imperfections that will disappear as markets become more efficient.[1]

In light of the above, the question naturally arises as to whether the processes and outcomes of Asia's transition to market economies are the same as those followed in the West. We begin by revisiting two key assumptions of the embeddedness perspective: that an actor's purposive quest to form and develop network ties occurs in a stable institutional

[1] Some scholars (e.g. Sandel. 2012) even argue that contemporary American society is better characterized as one where social relations are an epiphenomenon of the market, in the sense that for example friendship relations can be bought in a marketplace.

setting; and that within this setting the most important basis of affiliation is prior school or workplace ties – defined as the co-affiliation of two individuals to the same educational institution or work organization (see for example Rider, 2012). On the basis of these assumptions, prior research in the embeddedness perspective has proceeded to examine structural properties of networks such as the size, strength and duration of ties and their influence on economic activity.

More recently, scholars have begun to question these assumptions, examining how variations in the institutional context surrounding network members affect economic outcomes. For example, Vasudeva, Zaheer, Hernandez (2012) use a cross-national dataset to examine how the effect of brokerage positions on innovation outcomes depends on whether the national institutional environment of the broker promotes or hinders collaborative practices.

We probe the embeddedness perspective's assumption of institutional stability in a different way. Rather than comparing different national institutional contexts, we look within a single context – India undergoing evolutionary democratic change – to examine how the macro as well as micro institutional environment affects decision makers' purposive quest to form and develop network ties. We use the term 'macro' institutional environment to refer to broader societal influences and the changes in these influences engendered by the economic reforms of 1991; and 'micro' institutional environment to refer to the specific organizational forms (such as firms that are part of domestic business groups, and the local subsidiaries of western multinationals) within which decision makers are situated. The Indian setting thus offers scholars a rare opportunity to build and test theory on how multiple institutional bases of affiliation may simultaneously coexist and act as alternative foci for high-quality interpersonal networks to emerge and facilitate economic activity. Feld (1981) defined foci as any social, psychological, legal or physical entity around which joint activities occur, thus constituting a basis of affiliation that allows network ties to emerge.

We utilize the notion of foci to direct research attention to the 'extra-network' aspects of social structure that produce systematic patterns of social network ties. More generally, scholars have noted that the embeddedness approach overlooks the role of "larger, historically transient social structures" within which economic actions are embedded (Lie, 1997: 351). We address this oversight in the embeddedness perspective by examining how changing social structures in a transitional economy (in this case India) affect the behavior of influential economic agents – in this case evaluations of individual equity analysts following publicly listed Indian firms.

Equity analysts are influential economic actors who play a vital role in financial markets by revealing material information on the firms they follow, thereby improving the efficiency of such markets, which constitute a pillar of the modern market economies that nations in transition seek to build. Transitional economies, including India, are slowly filling the institutional voids (Khanna & Palepu, 1998; North, 1990) that hampers effective market functioning, in part by nurturing and developing important information intermediaries such as equity analysts, rating agencies and the financial press. Arguably the most critical aspect of the equity analyst's job is to forecast a firm's future annual earnings per share (EPS). Equity analysts utilize information obtained from publicly available disclosures made by the firms they follow in order to make EPS forecasts. However, in transitional economies the quality of the information that is publicly available is often poor (Morck, Yeung & Yu, 2000; Chan & Hameed, 2006). Instead, high-quality information often flows in social networks that outsiders may find hard to penetrate. Isolating how embeddedness matters (i.e., identifying how and from whom equity analysts obtain useful and valuable information to produce their EPS forecasts) is critical. Our specific interest is to examine how different social network pathways between equity analysts and the CEO of the firm they follow influence the accuracy of analysts' forecast of the focal firm's EPS.

We begin by contrasting two types of foci (Feld, 1981) for network affiliation in India: the traditional foci of caste and language, which are of historical salience (Ghurye, 1969; Srinivas, 1957), with the more contemporary foci of university alumni membership. The caste system, defined as a status hierarchy of endogamous groups that individuals enter only by birth (Dumont, 1980; Ghurye, 1969; Srinivas, 1957), historically regulated interpersonal interaction – across economic, social and religious domains in Indian society; although it is less clear to what extent caste matters in the contemporary Indian economy. In parallel, distinct regional languages have created a natural communication barrier between different language groups, although the use of English as an intra-national language in India (Kachru & Quirk, 1981) lowers such barriers in commerce.

We first explore whether social network pathways between analysts and CEOs formed by traditional and contemporary foci of affiliation influence analysts' forecast accuracy. We then study how change in the macro and micro institutional environments facing decision makers in contemporary India may influence the basis of affiliation, drawing on the notion of imprinting (Stinchcombe, 1965). We examine the contingent effect of change in the macro institutional environment, proposing that individuals' drawn from different generational cohorts vary in their use of traditional versus contemporary foci of affiliation. Specifically, we posit that the importance of caste and regional language as the basis for social affiliation will be particularly important for CEOs from the pre-reform generation, whereas university alumni-based co-affiliation will be more important for those of the post-reform generation.

We then examine how the micro institutional environment matters by investigating whether decision makers in firms that represent different organizational forms build and develop embedded ties differently. We argue that organizational forms act as carriers for values and norms that legitimate certain types of role behavior and sanction others, thus moderating the link between CEO-analyst interpersonal networks and analyst forecast

accuracy. We contrast the Indian business group as an organizational form with a western multinational corporation (MNC). We argue that Indian business groups' organizational practices provide an organizational climate where particularistic ties (Weber, 1905) offer a natural way to conduct economic exchanges, whereas western MNCs foster an organizational climate within their local subsidiaries where economic exchanges involving particularistic ties are likely to be avoided.

Understanding how traditional and contemporary bases of affiliation coexist in transitional countries such as India is important since it identifies the social structure within which the economic elite are embedded, with associated implications for the transition of such countries into modernity. The fundamental thrust of our study is to provide evidence on how economies in Asia may modernize without necessarily westernizing. By modernizing we mean applying reason to solve societal problems (Gray, 1998). By westernizing we mean approaching the normative ideal of a 'market society' where economic relations are dis-embedded from social relations, as described by Polayni (1944). We provide two insights on this broad theme. First, our findings suggest that in Eastern economies such as India, embedded ties matter as much for the younger, post-economic reform generation CEOs as it does for the older, pre-reform generation; it's just that the foci of affiliation are different across the two generations. Second, we find evidence that business groups as an organizational form represent a blend of modern management practices with norms that legitimate and encourage particularistic behavioral patterns amongst occupants of CEO positions in business group affiliated firms.

THEORY

The dominant perspective in modern finance theory, known as the efficient market hypothesis (EMH), contends that financial markets allocate capital to the most productive use because they are informationally and allocatively efficient (Fama, 1976; Jensen, 1978).

Although stated in a variety of ways, the central claim of the EMH is that financial markets achieve a high level of informational efficiency, whereby (financial) asset prices quickly incorporate all material information[2]. Informational efficiency in turn generates allocative efficiency (Zuckerman, 2012), whereby securities prices are the best estimate of the present value of the future income stream from such securities; hence financial markets allocate capital to the most productive use. In summary, the consensus view in the finance literature is that equity markets allocate capital efficiently, and an important driver of efficient capital allocation is the material information regarding securities, which then translates into changes in securities prices that in turn efficiently direct the flow of capital.

Equity analysts are influential individuals who play a key role in revealing material information to equities markets. A large part of an analyst's job is to research and produce reports forecasting aspects of public firms' future prospects, and to translate these forecasts into stock recommendations. Based on financial, operational and strategic analyses, an analyst generates periodic reports on a small number of public firms; the primary conclusion of an analyst's report is a "buy, sell, or hold" recommendation (Schipper, 1991). Arguably the most important contributing input to this recommendation is the analyst's forecast of the firm's future annual earnings per share. Analysts are incentivized to be as accurate as possible in their earnings forecasts (e.g. Hong & Kubik, 2003) since investors perceive earnings to be the accounting variable with the most information content when estimating firm valuation (Givoly & Lakonishok, 1984). In essence, equity analysts are information intermediaries who play a critical role in facilitating the proper functioning of stock markets, and their opinions and judgment have the potential to influence the stock price movement and the firm's valuation (Womack, 1996).

Given their influential role in financial markets, equity analysts have been the subject of significant research attention by finance, accounting and management scholars (e.g.,

[2] The "semi-strong" form of the EMH pertains to all public information, while the "strong" form includes all private information as well.

Cohen, Frazzini & Malloy, 2010; Feng & McVay, 2010; Westphal & Clement, 2008) seeking to understand the determinants of analyst firm coverage, the influence of analysts on investor behavior, the incentives of analysts and their forecasting biases, the interaction between analysts and management, multi-point contact between analysts (e.g., Greve & Mitsuhashi, 2012) and so forth. Among such questions, analysts' forecast accuracy, defined as the difference between analysts' forecasted earnings per share and actual earnings per share of the focal firm[3], has attracted considerable research attention (e.g., O'Brien, 1987; Sinha, Brown & Das, 1997; Stickel, 1992).

Scholars have found that factors such as analyst experience, task complexity and resources provided by brokerage houses have a significant influence on analysts' forecast accuracy (Clement, 1999). Yet a fundamental determinant of forecast accuracy is the material information they are able to access from the firms they follow. Gaining privileged access to material information is particularly important in transitional economies due to the less developed institutional infrastructure (Khanna & Palepu, 1998) around the rules of public disclosure by listed firms, as well as their enforcement. Hence, equity analysts may need to access material private information via interpersonal network pathways to the focal firm's management team. Arguably the most important individual in the focal firm's management team is the CEO; a high-quality interpersonal network pathway to the CEO will provide reliable access to confidential information that will facilitate more accurate EPS forecasting[4].

Prior work on analysts' use of personal networks has identified university co-alumniship (also called 'school ties') (Cohen et al 2010) as having a significant positive effect on analyst forecast accuracy, perhaps because the societal context in question (the UK and US) made only such ties salient to decision makers, although theories of tie formation

[3] The absolute difference between forecasted and actual EPS is normalized by the focal firm's stock price.
[4] It is important to note that in this setting, equity analysts have interactions with their target firm's CEO on a continual basis via analyst conference calls, face to face meetings at investor road shows etc. In network parlance, it is reasonable to assume that a *weak tie* (Granovetter, 1973) already exists between equity analysts and focal firm CEO. The theory in this paper is focused on the bases of affiliation that might lead to a strong, high quality network pathway between analysts and CEO, thereby leading to transfer of material private information that facilitates accurate forecasts.

and development stress that multiple foci (Feld, 1981) of affiliation can feasibly allow embedded ties to emerge. Transitional economies undergoing evolutionary change, such as India, offer an opportunity to build theory on how multiple institutional bases of affiliation may simultaneously coexist, and thereby offer alternative paths for high-quality interpersonal networks to emerge between analysts and CEOs of the firms they follow.

Institutional bases of affiliation in the Indian context

India represents a strategic empirical setting to observe the effects of multiple institutional bases for affiliation, since the Indian republic is engaged in institutional change in a democratic manner. The imprints of temporally different institutional bases of affiliation are therefore layered upon one another, with traces of the old bases surviving and persisting over time, allowing us to see how such traditional bases of affiliation coexist with contemporary ones in facilitating economic action.

In contrast, in settings such as China and Vietnam, traditional social relations were erased as a result of the communist revolution, and the ensuing transition to a market economy is emerging directly from communist society. There is an extensive research literature on the institutional challenges of such transitions (see Clague & Rausser, 1992 for a seminal example) but much less work on democratic change such as that seen in India. Here we examine two traditional bases of affiliation in India's social structure – caste and language – and contrast these with a more contemporary basis of affiliation – university co-alumni membership.

Traditional foci of affiliation: One of the most salient institutional features of Indian society is caste. Historically, the caste system's primary function was to regulate interpersonal interactions in religious, social and economic life by creating a hierarchical division of society into five endogamous groups (termed *varnas*) and specifying permissible interactions across these groups (Ghurye, 1969; Srinivas, 1957). At the top of the hierarchy

are priests (*brahmins*), warriors (*Kshatriyas*) and merchants (*vaishyas*). These groups historically had access to significant material resources and freedoms; today they are termed 'forward castes' by the Indian government and do not enjoy any special privileges in the modern Indian state's affirmative action programs. Other castes, the peasants (*shudras*) and the untouchables (now called *Dalits* and formally outside of the caste system) historically faced significant discrimination, particularly the *Dalits*. Today they are respectively designated 'backward caste' and 'scheduled caste' by the Indian government and are the beneficiaries of special affirmative action programs.

Scholars who focus on caste in *historical* Indian society either view it as a status hierarchy (e.g. Dumont, 1980) based on ideological rather than material resources, or as a social system for economic exploitation (e.g. Wiser, 1988). However, treatment of the caste system as practiced in *contemporary* Indian society focuses on caste as a way of demarcating non-hierarchical, differentiated groups that exhibit local dominance in economic or political terms, irrespective of their formal position in the normative *varna* scheme (Srinivas, 1987). In our theorizing we utilize this latter view of caste since our empirical context is constituted mainly by forward castes, where issues of hierarchical arrangement *within* the forward castes are less likely to matter in economic exchange.

The other historically important institutional basis of affiliation is regional language. These belong to several language families, the predominant ones being the Indo-European languages spoken in Northern parts of India and the Dravidian languages spoken in the South. As per the 1991 census, there are 18 officially recognized languages, of which 12 are spoken by over ten million people. Language in India is strongly related to regional culture and customs (Ramaswamy, 1997), with the states (provinces) organized along linguistic lines following independence from the British crown. Regional language diversity in India is an important reason that English is often used as the lingua franca through which different language groups communicate (Kachru, 1983). Although sociolinguists now consider Indian

English to be a distinctive variant of the English language (Kachru, 1983), an individual's knowledge and use of regional language is a strong signal of regional identity in contemporary India (Krishnamurti, 1990).

Contemporary foci of affiliation: In contrast to the traditional institutions of caste and regional language as the basis of affiliation, a more contemporary basis of affiliation is the higher educational institution in which individuals participate. The post-independence Indian government greatly increased the number and diversity of higher educational institutions. Initially, forward castes dominated the student population in such institutions, but strong affirmative action in India has led to university admissions across caste barriers, although differences still remain (Bertrand, Hanna & Mullainathan, 2010). Our argument hinges on the notion that higher educational institutions act as important "social sieves" by structuring opportunities for individuals to interact and form relationships (Jencks & Riesman, 1968).

Bases of affiliation and analyst forecast accuracy

We first develop baseline predictions on how social affiliations between equity analysts and the CEO of the target firm will influence the analyst's EPS forecast for the target firm. Irrespective of the institutional basis of the affiliation, as outlined below, the two mechanisms of trust formation and improved communication lead to better forecasts when the analyst and the CEO share the same caste, language or university affiliation.

When social actors share a common basis of affiliation, trust is more likely to emerge between them for two reasons. First, due to in-group bias (Brewer, 1979), individuals are more likely to perceive in-group members as honest, trustworthy and cooperative (compared to out-group members). Second, actors in the same social category are more likely to develop mutual understanding of each other's perspectives and have common expectations about each other's behavior (Zucker, 1986). Further, there is greater ease of communication between socially similar actors due to a shared knowledge, vocabulary, attitudes, and world view

(Huston & Levinger, 1978; Rogers & Bhowmik, 1970). Given these mechanisms, we would expect high-quality information and other resources to flow more easily between two actors with a common affiliation.

Evidence of these mechanisms has been reported in a number of empirical studies. Ethnographic evidence suggests caste is a strong in-group in economic exchange in traditional manufacturing sectors of the Indian economy. For example, Menning (1997) found that textile-industry entrepreneurs in Surat, India, were more likely to form inter-firm exchange ties with others of the same caste rather than outsiders. Likewise, using quantitative methods, Vissa (2011) found evidence that language similarity between Indian software entrepreneurs and their new network contacts significantly improved the odds of initiation of an economic exchange tie between their respective organizations. In a related vein, using large sample data from the US and UK, Cohen et al. (2010) found evidence of the positive effect of school ties on analysts' earnings estimate accuracy in the United States and in the United Kingdom.

Applied to our study context, we expect analysts who share a basis of affiliation in terms of caste, language or university (i.e. school) with the CEO of their target firm are more likely to produce accurate EPS forecasts of the target firm because of the reliable, timely transfer of high-quality material information on the firm's economic performance and future prospects. More formally our baseline prediction is:

> **H1:** An equity analyst is likely to make more accurate annual EPS forecasts of a firm when he or she shares a (i) caste tie, (ii) a language tie, or (iii) a school tie with the CEO.

The contingent effect of imprinting by the macro and micro institutional environments

We expect the baseline effect of interpersonal network ties between equity analysts and CEOs of target firms to matter for analyst forecast accuracy – irrespective of whether the

interpersonal network pathway is based on a traditional or contemporary basis of affiliation. However, it is unclear whether and how the salience of traditional and contemporary foci of affiliation will vary between these actors. The institutional pluralism of the Indian context allows us to build theory on how the salience of different foci of affiliation may vary among decision makers situated in different institutional environments. Since CEOs of target firms are privy to confidential material information which equity analysts need in order to make accurate EPS forecasts, we focus specifically on the institutional environment in which the CEO of a target firm is situated. We develop predictions on the contingent effect of the macro as well as micro institutional environment on CEOs of target firms, drawing on the notion of imprinting (Stinchcombe, 1965), and suggest that decision makers bear the imprint of both the macro and micro institutional environments in which they are situated. While macro institutional environment refers to broader societal influences and significant changes in these influences caused by the economic reforms of 1991, micro institutional environment refers to the organizational form (domestic business group or subsidiary of western MNCs) within which decision makers are situated.

Macro-institutional environment and shift of foci: CEO generational cohort effects

A key mechanism by which the macro institutional context exerts an influence is through the imprinting effects on the generational cohort that CEOs are drawn from. We examine the contingent effect of change in the macro institutional environment by considering how individuals from different generational cohorts vary in their use of traditional versus contemporary foci of affiliation. Specifically, we argue that the importance of caste and regional language as the basis for social affiliation will be particularly important for CEOs drawn from the pre-reform generation; whereas university alumni-based co-affiliation is likely to be more important for the post-reform generation. We thus develop an

argument on *when* equity analysts benefit from leveraging caste or language-based linkages with CEOs, as opposed to school-based linkages.

Stinchcombe (1965) suggests that individuals and organizations are imprinted by the prevailing institutional environment at birth or during early socialization when they are especially susceptible to such influences. We postulate the older generation of CEOs, which bears the imprint of the pre-reform institutional era, is more likely to transfer material private information along caste or language-based networks rather than school-based networks. More specifically, we posit that affiliation on the basis of traditional foci (caste and language) is likely to be stronger for the pre-reform generation compared to post-reform generation CEOs.

The notion of caste as a mechanism for regulating social interactions in childhood and early adulthood prevailed in pre-independent India as well as in the early stages of the Indian republic, when caste-based ties were considered a legitimate and appropriate regulator of social interaction, even in economic settings (e.g. Wiser, 1988). Likewise in newly independent India, even large urban centers remained largely insular in terms of the language groups residing in those communities. Although there is little systematic evidence, anecdotal accounts suggest that after independence, with the gradual increase in economic activity and urbanization, caste and language gradually became less salient bases of affiliation with the passage of time.

However, the economic reforms of 1991 accelerated the declining salience of caste and language in economic exchange by significantly increasing the speed and scope of urbanization and geographic mobility. Observers have documented how the economic reforms caused a dramatic change in the prevailing institutional environment (Ahluwalia, 1995) by unleashing greater competition, greater urbanization as well as creating greater inter-connectedness of different local regions in India into a coherent single pan-India market for products and services, served by pan-India firms.

In essence, given increased urbanization and sustained economic growth as a consequence of the reforms, caste as a mechanism for regulating individuals' social interaction has declined over time (Desai & Dubey, 2012). For example, Kapur et al (2010) noted that the physical distance between members of Dalit versus non-Dalit castes at wedding celebrations has declined over time, particularly since the reforms, suggesting a greater commingling of people from different castes[5]. The integration of India as a national market for products led to greater mobility of input factors such as skilled labor. Geographic mobility across regions for job/career reasons has undermined the salience of regional language-based as well as caste-based affiliations in the post-reform era.

As a result, the cohort of CEOs that completed their university education and entered the workforce after the introduction of economic reforms (the post-reform generation) is less likely to be imprinted with caste or regional language as the salient basis of affiliation. In essence, we conceptualize the launch of reforms as an exogenous precursor for radical change in the macro institutional environment and argue that CEOs who entered the workforce in the post-reform era will be differentially imprinted compared to those already in the workforce. Stated more formally:

H2a: The effect of same caste or same language ties between CEO and equity analyst will be *weaker* for post-reform generation CEOs.

In addition to making caste and language less salient, we argue that the reforms have increased the salience of educational institutions as a focus for embedded ties to emerge. Post reform, there has been an increase in the number of people joining organizations in executive roles after formal tertiary education (Kijima, 2006), just as there has been a substantial expansion in the competitive landscape with the entry of foreign firms that attach more

[5] More extreme practices of the caste system included regulation of physical distance between Dalits and forward castes in social interaction; although this practice is illegal in modern India.

importance to tertiary education when recruiting. In other words, the importance of tertiary educational institutions in regulating access to jobs, especially managerial jobs, has increased since start of economic reforms in 1991.

Hence, post-reform generation CEOs who attended university and entered the managerial ranks after the reforms are more likely to be imprinted with university alumni membership as a salient basis of affiliation. Indeed, such institution-based sentiments of solidarity may encourage individuals to share resources with those who share their educational affiliations (e.g. Siegel, Wright, and Lockett, 2007). More formally, we predict:

H2b: The effect of a shared school tie between CEO and equity analyst will be *stronger* for post-reform generation CEOs

The micro-institutional environment and shift of foci: Organizational form effects

We now examine how the micro institutional environment matters by investigating whether decision makers attention to social ties as pathways for conveying private information depend on the organizational context in which they are situated. We posit that organizational forms act as carriers of values and norms that legitimate certain types of role behavior and sanction others, thus moderating the link between CEO-analyst interpersonal networks and analyst forecast accuracy. We adopt Winship and Mandel's (1983) conception of 'role' as representing abstract notions about categories or positions, the sorts of individuals who ought to occupy those positions, and the behaviors expected from (and anticipated by) individuals who occupy those positions. By 'organizational form' we refer to those features of an organization that identify it as a distinct entity, and at the same time classify it as a member of a group of similar organizations (Romanelli, 1991). Scholars have noted that depending on their organizational form, organizations vary in the way they coordinate activities and maintain organizational boundaries (Aldrich & Mueller, 1982) because of

enduring differences in organizational culture, structure, power distribution and control systems (Tushman & Romanelli, 1985).

We contrast the Indian business group (BG) as an organizational form with that of a Western multinational corporation (MNC). We posit that the organizational practices of a BG create a climate where particularistic ties (Weber, 1905) are a natural way to conduct economic exchange, whereas western MNCs' Indian subsidiaries foster an organizational climate where economic exchange involving particularistic ties is more likely to be avoided.

Emerging economies offer an interesting meeting ground of different organizational forms (Scott, 1995) for organizing economic activity within firms. For example, a Western multi-national enterprise operates in an emerging economy in Asia through a local subsidiary, where the subsidiary is administratively controlled by headquarters through complex, matrix structures at the regional and global level (e.g. Gupta & Govindrajan, 1991; Tallman, 1992). In contrast, domestic entrepreneurs in Asian emerging economies tend to organize in structures known as 'business groups', conceptualized in the management literature (e.g. Granovetter, 1994; Khanna & Palepu, 2000; Khanna & Rivkin, 2001; Lincoln & Gerlach, 2004) as stable social structures of legally independent firms that are linked by dense formal and informal network ties, and are accustomed to taking coordinated action.

Our central argument is that depending on their organizational forms, organizations act as carriers and legitimizers of particular types of behaviors and role expectations (Selznick, 1948; Scott, 2008; Winship and Mandel, 1983). Western MNCs are carriers of a particular form of organizational arrangements wherein the routines and capabilities of the organization reflect the universal logic of impersonal rules of behavior and economic exchange based on arms-length relationships with exchange partners (Jaeger, 1983; Vitell, Nwachukwu, & Barnes, 1993). Although scholars have noted that such practices need to be modified when implemented in host countries to conform to the local institutional environment (Bartlett & Ghoshal, 1999), essentially local subsidiaries of MNCs will

significantly reflect the parent's national culture (Hennart & Larimo, 1998). Applied to the case of Western MNCs operating local subsidiaries in India, the organizational climate would guide CEOs of local subsidiaries to appropriate role behavior where they eschew particularistic relationships (whether based on a traditional or contemporary basis of affiliation) as channels to convey sensitive, material information[6].

The administrative heritage (Bartlett & Ghoshal, 1999) of Western MNCs is distinctively different from that of local Indian business groups in that the MNCs' subsidiaries' culture and ethos create an environment where sharing and discussing material private information with outsiders such as equity analysts is considered unprofessional. In short, the internal climate socializes CEOs to take on role behaviors that lower the odds of creating embedded ties with potentially influential external observers such as equity analysts on the basis of joint affiliations – be they of the traditional or contemporary kind. More formally stated:

> **H3:** The main effect of the caste, language or school ties between the equity analyst and the CEO on the analysts' EPS forecast of the focal firm is likely to be *mitigated* when the focal firm is an Indian subsidiary of a Western multi-national corporation.

The second form of organization that we consider is the business group (BG). Typically, a BG consists of a group of companies, often in diverse businesses, with one or more families having controlling ownership of all the individual companies either directly and/or through cross-holdings. Firms belonging to BGs constitute a special category of family firms because, in addition to family ownership, they are also subject to the limitations and strengths associated with belonging to a network of firms tied by common ownership. We explain

[6] Note that these arguments apply only to Western MNCs; we expect that Asian MNCs (Jaeger, 1983) would be similar to Indian business groups but our range restricted sample does not allow us to theorize about Asian MNCs as an organizational form – hence we draw predictions on Indian BG compared to western MNCs.

below why social affiliations (i.e. particularistic ties) are important pathways for the flow of information when the CEO is drawn from a business group firm.

Business groups historically operate as a network of firms that draw resources from each other and from the parent firm based on individual-based network ties[7]. There are anecdotal examples of some business groups being dominated by business communities such as Marwaris and Parsis (Lamb, 1955). Their culture and ethos create an environment in which CEOs of BG-affiliated firms find it entirely appropriate and legitimate to share information about their firm's prospects to analysts affiliated on the basis of caste, language or even university, since network ties in general constitute a normal part of organizational life and commercial transactions in such organizations (Vitell, Nwachukwu, & Barnes, 1993). Indeed, this sort of information sharing could be expected role behavior for executives in BG-affiliated firms. Rich descriptions (e.g. Khandwalla, 1980; Encarnation, 1989) of Indian business groups' top executives provide plausible evidence of this mechanism. In essence, therefore, we posit that the organizational and governance structure of business groups will focus managerial attention (Ocasio, 1997) on particularistic ties as a natural pathway to share information across firm boundaries. More formally:

H4: The main effect of the caste, language or school tie between the equity analyst and the CEO on the analyst's EPS forecast of the focal firm is likely to be *amplified* when the focal firm is affiliated to an Indian business group.

METHODS

Data and Sample

The sample firms for our study were obtained from the Institutional Broker Estimate System (I/B/E/S) Detail History tape, from which we only kept companies whose reporting

[7] Please see Khandwalla, 1980 for a rich description of the management style in Indian business groups

currency is the Indian Rupee from 2001 to 2010.The I/B/E/S database contains the most comprehensive information on analysts and their brokerage houses, analyst forecast value, firms they followed, and forecast release time (Clement, 1999; Fang & Yasuda, 2009; Hong & Kubik, 2003; Rao, Greve & Davis, 2001), and thus provides the basis for our research sample firms. We only kept firm-years with more than three analyst forecast values, and if an analyst issued more than one forecast for a specific firm-year, we used the forecast which was closest to the actual earnings announcements. We then merged these firm-year observations with *Prowess* database from the Centre for Monitoring Indian Economy from which we obtained financial information of these Indian firms. *Prowess* database is widely used by scholars (e.g., Khanna & Palepu, 2000; Chacar & Vissa, 2005) to conduct large sample studies on Indian firms. Since our key independent variables are analyst-CEO affiliations, we needed to identify each analyst and CEO and their corresponding caste, language, and their undergraduate and graduate school information. As we will discuss later, several data sources were used to collect their personal background information, but we were not able to reliably code the relevant information for all analysts and CEOs. After we excluded the missing observations, our final sample included 141 firms, 191 CEOs and 296 analysts who issued 1552 forecasts during our observation period.

We compared our final sample with the initial 474 Indian firms covered by 834 analysts in the I/B/E/S, and found that our sample firms are statistically larger (in both sales and assets) and more profitable (in ROA), and our retained analysts covered a greater number of firms and industry sectors, issued more forecasts, and have longer experience. Overall, it seems that compared to the population of Indian firms and analysts in the I/B/E/S database, our final sample is biased towards bigger firms and more experienced analysts, because we are more likely to find their information from public sources, especially as our research context is firms in an emerging economy. We believe that examining whether our conceptual model holds on a sample biased towards larger firms and more experienced analysts

represents a conservative test of our theory. This is because private information flows and thus the effect of CEO-analyst affiliations are generally expected to be stronger for smaller firms and less experienced analysts since they are subject to less public scrutiny of their actions and may have access to less formalized reporting and disclosure systems and practices. Finally, we also conducted semi-structured interviews with two senior equity analysts who provided anecdotal evidence on how access to private information helps equity analysts in their tasks of information discovery and interpretation.

Measures

Forecast Accuracy: We calculated our dependent variable, forecast accuracy as follows. We first obtained the raw forecast error measured as the absolute difference between the analyst's forecasted actual annual earnings per share (EPS) and the actual annual EPS reported by the firm, normalized by the share price at the end of the previous year (Clement, 1999; Fang & Yasuda, 2009). To facilitate interpretation, we multiplied this variable by minus one so that a higher score denotes greater forecast accuracy. In other words:

$$\text{Forecast accuracy}_{i,j,t} = -\left|\text{Forecast EPS}_{i,j,t} - \text{Actual EPS}_{j,t}\right| / (\text{Share Price}_{i,j,t-1})$$

Where analyst *i* forecasts EPS of firm *j* in fiscal year *t*. In a separate analysis, we also measured the analyst forecast accuracy by normalizing the raw error with the absolute EPS (Givoly, Hayn, & Lehavy, 2009), and our results were qualitatively the same.

Traditional bases of affiliation: A CEO and analyst dyad is formed if an analyst covers the focal firm led by a specific CEO in a specific year. We focus on two types of traditional basis of affiliations – based respectively on caste and regional Indian language. To measure the traditional basis of affiliations, we need to identify each target firm's CEO's and analyst's caste and language category. We proceeded as given below.

First, we collected each CEO's full name from the company's annual report[8]. Next, we followed prior research (Vissa, 2011) to use the CEOs' last name to derive the probabilities of their belonging to a specific caste or language group. We first identified whether a CEO is an Indian CEO or not based on their last name. For *non*-Indian CEOs, we coded their probabilities of belonging to a caste or language groups as "zero". For Indian CEOs, we cannot exactly identify a CEO's caste and language background. However, the sociological literature on Indic names provides strong evidence that Indian last names vary systematically with caste and region (Kaushik, 2000; Singh, 1996). We therefore adopted a strategy of probabilistically deriving caste and language categories from the last names using the same procedures as adopted by Vissa (2011).

We first obtained data from the two largest Indian online matrimonial agencies that maintain details on the last name, caste, religion and mother tongue (language) of approximately 2.1 million individuals. The individual providing the data to these agencies is the prospective bride or groom (or an immediate family member). Given the purpose for which these details are disclosed (seeking marriage partners) and given the importance attached to caste, religion, and language in the Indian social milieu, the individuals reporting this information have the right incentives to be accurate. For coding the caste variable, we considered the following ten categories of caste and religion: Brahmin, Kshatriya, Vaishya, Shudra, Dalit, Christian, Muslim, Parsi, Sikh and Jain[9]. Then we coded the relative frequencies with which a particular last name mapped to different caste groups. For example, the 11,486 occurrences of the last name "Gupta" in the matrimonial database map to the following caste categories (relative frequencies in parentheses): Vaishya (92%), Brahmin (5%), Kshatriya (3%) and less than 0.2% in each of the other categories. We interpret these relative frequencies to mean that a person whose last name is "Gupta" belongs to the Vaishya

[8] Indian firms sometimes use titles like 'Managing Director' to refer to the CEO position. We code an individual as CEO if the formal title used is CEO, or Managing Director (MD) or Chairman & Managing Director (CMD)
[9] Note that this coding represents non-Hindu religions as caste categories. Our results remain robust to dropping non-Hindu analysts and CEOs from the analysis as well as coding religion separately.

caste with 92 percent probability, to the Brahmin caste with 5 percent probability, and to the Kshatriya caste with 3 percent probability. (Refer to Vissa (2011:146-147) for detailed explanations of this methodology).

For each analyst, I/B/E/S provides his/her numeric identifier, last name, the initial of first name, and the affiliated brokerage firm. Following prior research (Cohen et al., 2010), we deleted observations with multiple names for a given numeric identifier or with multiple identifiers for a given name. Then, using the last name of each analyst, we used identical procedures on the matrimonial database to obtain each analyst's probabilities of belonging to a specific caste category.

Next, to measure ***CEO-analyst caste tie***, we calculated the joint probability of the CEO and the analyst belonging to the same caste. This is calculated as the sum of the joint probabilities of the CEO and analyst belonging to each of the ten caste categories. That is, for any CEO 'c' and analyst 'a' dyad,

$$(\text{CEO-analyst caste tie})_{c,\,a} = \sum_{j=1 \text{ to } 10} P(c_j) * P(a_j)$$

Where $P(c_j)$ is the probability of CEO 'c' belonging to caste 'j' and $P(a_j)$ is the probability of analyst 'a' belonging to caste 'j' .

We measured ***CEO-analyst language tie*** using the same procedures for measuring caste ties. More precisely, we first created indicator variables to code the Indian languages in which a focal actor could carry on a business conversation (in addition to English, which we assume all actors in our setting were proficient in). We coded ten language categories (which account for about 90% of the analysts' and CEOs' last names) namely: Hindi, Bengali, Gujarathi, Marathi, Tamil, Telugu, Kannada, Malayalam, Tulu and Konkani. Then we coded the relative frequencies with which a particular last name mapped to language groups using the data from the matrimonial database. Continuing the earlier example, the 11,486 occurrences of "Gupta" in the matrimonial database map to the language of Hindi (98%) or Telugu (2%). We interpret these relative frequencies to mean that a person whose last name is

"Gupta" knows Hindi with 98 percent probability and knows Telugu with 2 percent probability.

We then calculated ***CEO-analyst language tie*** as the joint probability of the CEO and the analysts being proficient in the same Indian language. This is calculated as the sum of the joint probabilities of the CEO and analyst belonging to each of the ten language categories.

$$(\text{CEO-analyst language tie})_{c,\,a} = \sum_{j=1 \text{ to } 10} P(c_j) * P(a_j)$$

Where $P(c_j)$ is the probability of CEO 'c' belonging to language category 'j' and $P(a_j)$ is the probability of analyst 'a' belonging to language category 'j' .

Contemporary basis of affiliation: The contemporary basis of affiliation we focus on in this study is whether CEO and analyst were affiliated to the same educational institution. We measured ***CEO-analyst school tie*** as follows. We first coded the school name that each CEO and analyst graduated from, taking care to include both undergraduate and postgraduate educational institutions that they attended. Collecting data for CEOs' educational background was easier since we could rely on the company's annual report disclosure. In contrast, we had to use a variety of sources to code educational background for each analyst. Our main data source is Zoominfo.com, a search engine that specializes in collecting biographical and employment data from publicly available documents (Cohen, et al., 2010). From this site, we obtained each analyst's full name, job title and employment history to correctly identify an analyst in our initial set by matching the information of last name, the initial of first name and the affiliated brokerage provided by I/B/E/S. When we were unable to determine the analyst's educational background using Zoominfo.com, we used other sources available over the Web on a case-by-case basis to collect additional information and confirm any conflicting information from different sources. We coded conflicting educational data as missing in all cases where we could not resolve conflicting information.

Based on the available educational background information, we coded ***CEO-analyst school tie*** as "1" if the CEO and analyst graduated from the same school and as "0"

otherwise. For the results reported in the paper we coded CEO and analysts as drawn from the same school when they both graduated from the same school system (e.g. the IIT system), irrespective of the geographical location of the campus attended or the nature of the degree program (graduate or undergraduate). Our results are robust to a narrower specification of 'same school' defined as same campus or same degree program. If we could not find the educational background information for either CEO or analysts, we took a conservative approach and coded the CEO-analyst education similarity as "0". In other words, we likely under-represent the existence of CEO-analyst school ties which makes our hypothesis testing more conservative.[10]

Post-reform Generation CEO: As argued above, the launch of economic reforms in India during the fiscal year 1990-1991 constituted a significant change to the prevailing institutional norms for economic actors (Zattoni, Pedersen, & Kumar, 2009). Furthermore, we argued that the CEOs who started their professional careers subsequent to the launch of the reform era would be most susceptible to the changed institutional norms as opposed to CEOs who had started their professional careers under the earlier pre-reform economic regime. We therefore measured post-reform generation CEO as a dummy variable which was set to 1 if the CEO was born after 1967. We used 1967 as our birth year cut-off point because CEOs born in 1967 would have been around 24 years of age (which is a typical age for people finishing university education and entering the labor market) in 1991 when the economic reform was launched. Thus CEOs born after 1967 are likely to have undergone their university education during the post-reforms period, making it more likely that educational institutions could be more salient basis of affiliation for such individuals. We also

[10] One shortcoming of our data is that we could not find the graduation years for most of CEOs and analysts since most of the data are extracted from public sources which tend to omit graduation years.

used 1966 as another birth-year cut-off point to measure post-reform generation CEO and we found consistent results.[11]

MNC Firm: In India, the shareholder with a controlling ownership stake is called a 'promoter' and firms are required to disclose details pertaining to the promoter in all publicly listed companies. *Prowess* database classifies companies into different ownership categories on the basis of the controlling shareholder viz., foreign, state-owned (divided further into central or federal government owned and state or provincial government owned), business group and other private companies. *Prowess* uses a variety of sources to classify firms into these ownership groups based on continuous monitoring of company shareholding. To test our H3, we operationalize an MNC firm as a dummy variable which takes the value of "1" if the controlling shareholder is foreign as per Prowess database and "0" otherwise. All the MNC firms in our sample were Western multinational firms operating subsidiaries that were locally listed. We have this range restricted sample because the MNCs in our sample were operating in India prior to economic reforms of 1991 and were listed in local stock exchanges to comply with legal rules in force at the time.

Business Group Firm: Similar to the above, we use Prowess classification of ownership groups to operationalize firms affiliated to business groups. Our identification of business group affiliation is in line with past research on the effects of BG affiliation for Indian firms (Khanna & Palepu, 2000; Chacar & Vissa, 2005). To test for the interaction effect (Hypothesis 4), we created a variable for business group size which was then multiplied with the bases of affiliation. We adopted this approach since we reasoned that the moderating effect of business group affiliation was likely to be particularly strong for the largest business groups. Our results are robust to using a simple indicator variable for business group affiliation. Using Prowess data, we estimated business group size by adding

[11] In our sample, the positive interaction effect between post-reform generation CEO and CEO-analyst school tie on the analyst forecast accuracy was more robust. We obtained similar results by using any year between 1961 to 1968 as the birth-year cut-off point.

the revenues of all firms affiliated to the focal business group and used the log transformed version for our analysis[12]. Information about business group affiliation is transparent and unambiguous in India as these firms publicize their group affiliation and each firm is a part of only one group (Khanna & Rivkin, 2001). *Prowess* tracks business group affiliation of firms through continuous monitoring of company shareholding, news announcements and a qualitative understanding of the group-wise behavior of individual companies.

Control Variables*:** We drew from prior literature to generate a comprehensive list of control variables in our analyses, including firm characteristics, analyst characteristics, and their affiliated brokerage house characteristics (Byard, Li, & Weintrop, 2006; Clement, 1999; Fang & Yasuda, 2009; Hong & Kubik, 2003; Ke & Yu, 2006). Firm characteristics include ***firm size (measured by log-transformed total assets), ***prior firm financial performance*** (return on assets), governance condition, such as ***outsider ratio*** (the proportion of non-executive directors on the board), ***foreign institutional ownership*** (percentage of shares held by foreign institutions), and firm ***information environment*** (measured by the number of analysts following the focal firm). We used *Prowess* classification of ownership groups to control for ***state-owned firms*** (a dummy variable set to one if the controlling shareholder is the central or a state government).

Analyst characteristics include the ***number of firms covered by the analyst*** (a measure of analysts portfolio complexity)[13], individual analyst's ***firm-specific forecasting experience*** (measured by the number of years that the analyst follows the focal firm), ***total experience as an analyst*** (measured by the number of years that the analyst has been included in the I/B/E/S database), the ***forecast frequency*** (the number of forecast made by the analyst in the same period). Analysts may build stable relationship with the CEO over the years which may facilitate private information transfer. Thus we also included a control

[12] We divided this variable by 10 so that we can report coefficient numbers at least at the three-digit level after the decimal point.

[13] We've also tried to control an analyst's industry portfolio complexity (measured by the number of industry sectors covered by the analyst) and generated similar results. Since this variable is highly correlated with the number of firms covered by the analyst (r=0.83), we took out this variable in our final models.

variable ***CEO change***, which is set to 1 in the year when the focal firm has a CEO succession event. We expect CEO change to be disruptive for analysts and hence reduce their forecast accuracy. In addition, we used a dummy variable as a control – ***Star analyst*** – coded as one if an analyst has been ranked among the top five by *AsiaMoney* during our study period. We further controlled for ***Analyst's high status caste***, measured by the sum of the probabilities of an analyst belonging to Brahmin, Kshatriya or Vaishya, the top of the caste hierarchy. This is to control for the possibility that the better forecast accuracy is due to the analysts' higher status caste and better chance to access information, rather than their caste similarity to CEOs.

The brokerage house may provide different resources to the focal analyst and thus influence the analyst's performance in forecast accuracy (Clement, 1999). We controlled for the ***brokerage house size*** (measured by the total number of analysts employed by the brokerage house) as well as the ***brokerage house's industry sector coverage*** (measured by the total number of industry sectors covered by the brokerage house).

In addition, some brokerage houses may have continuous business relationship with the focal firm and thus analysts in these brokerage houses would benefit from their employer's ties with the focal firm. Therefore, to account for a potential alternative explanation that firm level ties were responsible for our observed effects, we also controlled for the effect of ***the brokerage house-firm relationship***, which is set to 1 if the focal analysts' brokerage house had provided any investment banking services, such as equity or debt offerings, to the focal firm six years before or two years after the year when the analysts issued their forecasts. Data were collected from SDC global offering to code this variable.

In addition, we also controlled for the potential effect ***forecast horizon*** (measured by the number of lag days between the date of a forecast was issued and the date at which the corresponding actual earnings is announced). Because our sample CEOs and analysts may include non-Indian individuals, we included two dummy variables: ***Indian CEO*** and ***Indian***

analyst. Further, since we had missing education information for both CEO and analyst, we included four dummies variables: ***CEO(analyst)'s undergraduate background*** (respectively equal to one if we cannot find the CEO(analyst)'s undergraduate information), ***CEO(analyst)'s postgraduate educational background*** (respectively equal to one if we cannot find the CEO(analyst)'s postgraduate information) . Finally, we also controlled for year fixed effects by using year dummies.

Analysis

Our panel data suggests that a firm-CEO may be covered by multiple analysts and an analyst may issue multiple forecasts for the focal firm over the years. Thus, we have repeated observations for each firm(CEO)-analyst pairs, with observations being both cross-sectionally and time-series correlated. This violates the assumption of independence in OLS regression analysis. We therefore employed a form of analysis proposed by the recent econometrics literature – two-way clustering analysis – which allows us to control for residual dependence across two dimensions. Two-way clustering analysis is robust to both time-series and cross-sectional correlation (Cameron, Gelbach & Miller, 2012; Petersen, 2009; Thompson, 2006), and produces well-specified test statistics compared to other methods which only correct for residual dependence in one dimension (such as Newey-West or Fama-MacBeth analyses) (Gow, Ormazabal, & Taylor, 2010)[14].

RESULTS

Table 1 reports descriptive statistics and correlations of all variables used in our empirical analyses. The average analyst issued 5.2 annual EPS forecasts during our study period and the average EPS forecasted was 22.76 Indian Rupee. The means, standard deviations and correlations are reasonable. As a further check for multicollinearity, we

[14] Specifically, we used STATA 12 with the command: "cluster2, fcluster(firm_ceo_id) tcluster(analyst_id)" where firm_ceo_id indicates each unique firm-CEO identification and analyst_id codes each analyst uniquely.

computed variance inflation factors (VIFs) for all models using ordinary least square analysis and the max VIF was 2.22, well under the maximum acceptable level of 10 (Kutner, Nachtsheim, & Neter, 2004).

=== Insert Tables 1 here ===

Table 2 presents our regression analysis results for testing Hypothesis 1 through to Hypothesis 4. Model 1 includes control variables only. Model 2 adds the bases of affiliation variables *CEO-analyst caste tie*, *CEO-analyst language tie* and *CEO-analyst school tie*– to test our first hypothesis H1 on the main effect of these ties. Model 3 adds the interaction terms between ties and post-reform generation CEO to test our hypotheses 2a and 2b. Models 4 and 5 add the interaction terms between ties and organizational form of the firms (MNC and BG forms, respectively) that CEOs are running to test our Hypotheses 3 and 4. Model 6 is our full model.

=== Insert Table 2 here ===

Main effects of traditional and contemporary basis of affiliation

Our first hypothesis H1 was that analysts with interpersonal network ties based on traditional or contemporary bases of affiliations with CEOs of the firms they cover would make more accurate annual EPS forecasts. Results in Model 2 suggest that the effect of *CEO-analyst caste tie* is positively significant (β=0.007, $p<0.05$). We find that the effect of *CEO-analyst language tie* in Model 2 is also positively significant (β=0.005, $p<0.05$). Finally, Model 2 shows that the coefficient of *CEO-analyst school tie* is marginally positively significant (β=0.004, $p<0.10$). These results remain in the full Model 6, thus we conclude that our data provide general support for H1 that embedded ties matter.

Macro-institutional environment and shift of foci: CEO generational cohort effects

Model 3 tests our second set of hypotheses which address how changes in the macro-institutional environment moderates the role of interpersonal network pathways in conveying private information. Specifically, we test how interpersonal network pathways to post-reform

generation CEOs may systematically differ from pathways to pre-reform generation ones. Our hypothesis 2a suggests that traditional bases of social affiliation based on caste and language would be weaker for post-reform generation CEOs. Results in Model 3 show that the interaction between *post-reform generation CEO* and *CEO-analyst caste tie* is negative and marginally significant (β=-0.014, $p<0.10$), and its effect remains in the full Model 6. However, we didn't find a statistically significant result for the interaction between *post-reform generation CEO* and *CEO-analyst language tie*, leading us to conclude that we only find some support for our Hypothesis 2a.

Our Hypothesis 2b suggests that the effect of contemporary basis of social affiliation will be stronger for post-reform generation CEOs. Results in Model 3 support this prediction since the interaction term between *post-reform generation CEO* and *CEO-analyst school tie* is positive and significant (β=0.015, $p<0.05$). This result remains in the full Model 6. Thus we find strong support for our Hypothesis 2b. Overall, we conclude from this analysis that we find good support for our predictions on the changing bases of social affiliation driven by generational cohort effects.

Micro-institutional environment and shift of foci: Organizational form effects

Models 4 and 5 seek to test hypotheses which address how change in the micro-institutional environment moderates the role of interpersonal network pathways in conveying private information. Specifically, H3 and H4 examines how the organizational form (MNC or BG) of the firm that the focal CEO leads may strengthen or weaken the main effect of embedded network ties between CEOs and analysts. Results in Model 4 show that two out of three interaction terms with dummy indicating MNC firm are statistically significant: the coefficient of the interaction between *CEO-analyst language tie* and *MNC firm* is -0.012 ($p<0.01$) and that of the interaction between *CEO-analyst school tie* and *MNC firm* is -0.017 ($p<0.001$) (However, only the result of the interaction term between school tie and MNC firm

remains in the full Model 6 with a decreased significance level). These results suggest that interpersonal network pathways between CEOs and analysts are weaker conduits for private information flows when the CEOs are leading local subsidiaries of Western multinational firms. We interpret this pattern of findings as moderate support for Hypothesis 3.

As we can see from Model 5 of Table 2, the interaction between *CEO-analyst language tie* and *BG firm* is positive and significant (β =0.010, $p<0.01$) and that of the interaction between *CEO-analyst school tie* and *BG firm* is also significant (β =0.011, $p<0.01$). Both results largely remain in the full Model 6. These results suggest that interpersonal network pathways between CEOs and analysts are stronger conduits for private information flows when the CEOs in question are leading firms that are affiliated with domestic business groups. We interpret this pattern of findings as good support for Hypothesis 4.

We graph these interaction effects in Figure 1. To save space, we only illustrate how CEO-analyst school tie's effect is strengthened or weakened by various moderators, based on the coefficients generated in full Model 6.[15] Specifically, Figure 1a graphs the interaction effect between school ties and post-reform generation CEO on analyst forecast accuracy. The graph shows that the slope of dotted line (when post-reform generation CEO=1) is much steeper than the solid line (when post-reform generation CEO=0), suggesting that the effect of CEO-analyst school tie on forecast accuracy is stronger if the CEO belongs to the post-reform generation cohort. Figure 1b illustrates how the effect of CEO-analyst affiliation is weakened, or even changed, by the MNC organization form. When the organization form is not MNC, the solid line suggests that CEO-analyst school ties help improve analyst forecast accuracy. It is interesting to note that the dampening effect of MNC is so strong that the dotted line (when MNC=0) shows a negative effect of CEO-analyst school tie on forecast

[15] We chose to graph the effect of CEO-analyst school tie because the co-alumni relationship has been examined in the developed economy context (Cohen, et al., 2010) and therefore allow scholars to directly compare our paper with earlier studies. Other graphs for the CEO-analyst caste tie or language tie are available upon request.

accuracy. Finally, Figure 1c illustrates how the effect of CEO-analyst school tie is strengthened by the BG organization form. The graph shows that CEO-analyst school tie in general improve analyst forecast accuracy, but such an effect is particularly strong in the dotted line, when BG firm has very large firm size (1 S.D. above the mean), a pattern consistent with our hypothesis.

=== Insert Figure 1 here ===

Robustness tests

These results are robust to a number of alternative specifications and measures. First, we obtain qualitatively similar results when our dependent variable is normalized with the focal stock's absolute EPS rather than the closing share price. We also get the same pattern of results when we use an indicator variable to code for business group. In addition, we get the same pattern of results when we drop the non-Hindu analysts from the sample or code non-Hindu religions separately instead of subsuming them as a caste category as reported in these tables. In another robustness test we also control for the CEO's country of origin - whether the CEO is a local or a foreign expatriate - and we obtain similar results.

Finally, we were concerned about biases in our estimate of caste and language which we infer from CEOs and analysts' last name to derive the probabilities of their belonging to a specific caste (language) group. Specifically we were concerned that while some last names might be highly concentrated in a particular group (e.g., Gupta belongs to the Vaishya caste with 92% probability), others might be relatively spread out (e.g., Kamath belongs to the Brahmin caste with 13% probability, to the Kshatriya cast with 39% probability, to the Vaishya caste with 18% probability). To address this issue, in separate analyses we first include each individual caste (language) group as additional control variables, and second, we create an entropy measure of how widely the last name's probabilities distribute across ten caste (language) groups as additional control variables. It was measured as $\sum_{i=1}^{N} P_i \ln(1/P_i)$,

where P_i is the probability of last name belonging to i^{th} caste (language) group, and N is 10 since we have 10 caste (language) groups. We get qualitatively the same results in these robustness tests after including additional control variables.

Supplementary analysis

We also ran supplementary analyses to examine the downside of access to private information via embedded interpersonal network ties. Specifically, we were exploring whether embedded ties cause analysts' forecasts estimates to be systematically biased upward. We reasoned that embedded ties might lead to analysts systematically favoring only positive material information about the focal firm and dis-favoring negative information, thus systematically leading to an optimistic forecast – a positive bias. We find some suggestive evidence of this pattern.

We were also interested in examining whether business groups and MNCs recruit CEOs from different labor market pools. Examination of the descriptive statistics suggested to us that there is no significant difference in the bases of affiliation in the CEO-analyst dyads across the two organizational forms. We then examined the caste and language composition of CEOs across the two organizational forms. Our conclusion from these two sets of descriptive statistics taken together is that a selection effect is less likely to be operating.

Finally, business groups vary in their complexity. If our theory holds, we would expect that, as complexity of the business group increases, it becomes more difficult for the equity analyst to predict earnings of the focal affiliated firm accurately because intra-group transactions are not easily observable to outsiders (Bae, Kang, & Kim, 2002). Under such conditions, the importance of ties to the focal firm's CEO would be very high because the high quality information that flows through such ties would be particularly useful to the analyst while preparing forecasts for firms affiliated to complex business groups. Hence we would expect a positive interaction effect between the business group complexity and the amplification effect of business group membership. In the supplementary analyses, where we

measured business groups complexities by product diversity (as a count of the two digit industries to which its member firms belong) and international market diversity (the number of countries in which the business group has subsidiaries through any of its affiliates), we found support for our argument: the amplification effect of business group affiliation on equity analyst forecast accuracy is stronger for more complex business groups.

DISCUSSION AND CONCLUSION

Our baseline results suggest that social network pathways between CEOs and analysts derived from traditional basis of affiliation of caste and regional language as well as university co-alumni membership that are contemporary basis of affiliation positively influenced the accuracy of analysts' earnings forecasts. Overall the effect of network ties between equity analysts and the CEOs of the Indian firms they follow is similar to that seen in developed economies such as the United States or the United Kingdom – themselves the context of much prior research on this topic. However, our investigations showed that unlike developed economies – where the basis of network tie formation was based on contemporary foci of affiliation such as university co-alumni membership, Indian analysts also used traditional, centuries-old institutional basis of affiliation to gain access to material private information. It was also interesting to note that the magnitude of effect sizes for these two different bases of affiliation was not statistically different. It would therefore appear that both traditional and contemporary basis of affiliation (amicably) co-exist in present-day Indian society and both facilitate individual economic action.

The contingent effect of imprinting by the macro and micro institutional environments

More interestingly, we found evidence that the macro and the micro institutional environments played important contingency roles. Specifically, examining the effect of the macro institutional environment we found that the traditional bases of affiliation drawing on

caste and language were particularly beneficial to analysts when the CEO of the target firm was drawn from the pre-economic reform generation. In contrast, ties to post-reform generation CEOs based on university co-alumni membership was particularly beneficial. In other words, older CEOs – who might be expected to be influenced more heavily by traditional social structures because they were imprinted by an earlier institutional era – seemed more susceptible to affiliation based on caste and language than younger CEOs. Hence, although both traditional and contemporary basis of affiliation (amicably) co-exist in present-day Indian society, it appears that an individual's preferences for a particular basis of affiliation is systematically influenced by their generational cohort. Thus the generational composition of economic actors is a significant indicator of which types of interpersonal network channels might be useful for private information flows.

In addition, we found that the micro-institutional environment – namely, the organizational form of the CEOs focal firm - significantly moderated the effect of network ties on analyst forecast accuracy. As we predicted, the bases of affiliation between analysts and CEOs were particularly beneficial for analyst forecast accuracy when the CEOs were drawn from firms affiliated to business groups. We also found the exact opposite when CEOs were drawn from firms that were Indian subsidiaries of Western multinationals – with the benefits of different types of affiliation being dampened in such cases. Our post hoc analysis suggested that the mechanism driving this result was more likely to be a 'treatment effect' likely due to differences in organizational practices that legitimate certain types of CEO role behaviors in business group affiliates compared with MNC subsidiaries. We did not find much evidence of a selection effect (i.e. CEOs for business group affiliates were selected from a different pool than their counterparts in the MNC subsidiaries).

We note that our study is based on archival sources and we do not observe the actual flow of private information from CEOs to analysts; neither do we observe the development of the interpersonal relationship. Rather we infer the formation and development of embedded

ties along with the flow of private, sensitive content. Likewise, we do not have data on the availability in the total pool of individuals drawn from different caste and language groups. This prevents us from correcting for base rate effects in the sample. Unfortunately, we are unable to determine the exact geographical location of analysts in our sample at the time of their issuing earnings forecast. We are therefore unable to test for alternative explanations involving assortative matching between brokerage houses and listed firms based on brokerage house's location. Furthermore we use a relatively novel methodology, whose bias is unknown, to infer caste and language ties from last names.

Despite these limitations and the exploratory nature of our findings, to the best of our knowledge, this is the first study to systematically examine accuracy of analyst forecasts in Indian financial markets and link it to access to material, private information via interpersonal networks. In doing so, we contribute to the network embeddedness and business group literatures as outlined below.

Highlighting the role of institutions in the embeddedness perspective

Our study's theory and findings are an important step forward for the embeddedness perspective. Much prior work in the embeddedness perspective assumes a stable institutional setting where primarily school or workplace ties matter (e.g. Ingram & Roberts, 2000; Rider, 2012). More recent cross-national research (e.g. Vasudeva, et al., 2012) has begun to unpack this assumption by examining how national institutional contexts moderate the relationship between network structure and economic outcomes. In contrast, our empirical context of a single country undergoing evolutionary change allowed us to examine how foci of affiliation drawn from traditional versus contemporary institutions influence individuals' economic actions. In doing so, we direct research attention to the extra-network aspects of social structure that produce systematic patterns of social network ties. In this study's setting, the individuals in question – equity analysts - are influential actors in financial markets, which

are traditionally conceived as arenas conducive for rational action. Our findings suggest that equity analysts purposively capitalize on the lack of regulation on public disclosures by listed firms by attempting to tap into whatever private interpersonal networks are available in order to make more accurate forecasts – despite the different institutional bases governing affiliation based on, say, caste compared to affiliation based on co-alumni in educational institutions. Viewed from the standpoint of Polanyi's (1944) thesis on the dis-embeddness in market societies, the interesting thing to note is that even for the younger (post-reform) generation CEOs, embedded ties seem to matter as much as it does for the older pre-reform generation CEOs – it's simply that the relevant focus of affiliation is different.

Our results complement work in the intra-organizational networks literature (e.g. Ibarra, 1993) set in the United States that shows how women and minority executives purposively build ties with demographically similar others (Tsui, Egan & O'Reilly, 1992) for emotional support, and with dissimilar others for instrumental resources. Our findings suggest that Indian equity analysts seem to purposively construct ties across different foci of affiliation to secure sensitive, private information that enables better task performance. In other words, while the managers studied by Ibarra (1993) engaged in purposive action to construct ties differently based on tie content, our findings suggest a process whereby analysts construct ties across dissimilar foci of affiliation, albeit for the same content. Overall, our results are consistent with the notion of (boundedly) rational analysts who are trying to be agentic in their basis of affiliation in the context of a fast changing social structure (Giddens, 1984), analogous to the Indian high technology entrepreneurs studied by Vissa (2011).

Organizational form and executive behavior

Our findings also draw attention to how organizational forms serve to regulate individuals' role behavior by providing guidance on appropriate norms of conduct and

appropriate ways of thinking. We contribute to the literature on organizational forms (Aldrich & Mueller, 1982; Romanelli, 1991) by highlighting the role of business groups as repositories and carriers of behavioral norms drawn from traditional institutions, particularly in societies undergoing transition to market economies. Our results on the amplifying effect of business group affiliations suggest that business groups continue to operate on particularistic principles. In other words, business groups as an organizational form may be one pathway through which traditional foci of social affiliation persist and have a lingering effect in Asian emerging economies. We see our results on the moderating effect of business group affiliation as an early illustration of the benefits of an imprinting approach that views organizational practices in response to early environments as highly consequential for the future. Our findings are consistent with recent work on how imprinting affects Norwegian communities' capacity for collective action (Greve & Rao, 2012), or the director selection practices of American corporations (Marquis, 2003).

Our investigation also has implications for research on the business group form more broadly. Research on business groups in emerging economies seems to suggest that emerging economy firms tend to benefit from group affiliation (Siegel & Choudhury, 2012; Khanna & Rivkin, 2001; Keister, 1998), especially when the groups in question are large (Chang & Choi, 1988) or well diversified (Khanna & Palepu, 2000). This relationship is in stark contrast to standard findings in the US context that corporate diversification is a liability (e.g., Palich, Cardinal, & Miller, 2000). Most explanations for the positive performance benefit of business group affiliation tend to draw indirect inferences from financial performance data. More recent research has begun to examine how business group affiliation drives firm behaviors – for example firm-level innovation (Chang, Chung & Mahmood, 2006) or firm-level learning patterns (Vissa, Greve & Chen, 2010). In this study we shift the focus to how business group firms differ as an organizational form from Western multi-nationals for the key decision makers within the firm. Our results imply that business groups

offer a distinctive organizational climate, relative to Western multinational firms on what is appropriate behavior for their senior executives.

Relational Demography

We also contribute to the research on relational demography (Tsui, Egan & O'Reilly, 1992) in two ways. First, we expand the different sources of demographic characteristics by considering traditional bases (such as caste and language) and more contemporary bases (such as school education). Prior work on relational demography primarily emphasizes the comparative demographic characteristics of members of dyads or groups who are in hieratical relationships (such as a superior vs. a subordinate), whereas we extend this research by examining dyads that operate across firm boundaries. We thus contribute to the relational demography literature by examining new demographic attributes that are prevalent in the East and not in the West (e.g. caste), by examining similarity in demographic attributes when individuals interact across a market interface (not within firm boundaries). In essence, our study helps to integrate prior research on relational demography with the embeddedness perspective.

Modernizing without Westernizing

Countries in the East that are transitioning to modernity - defined as applying reason to solve societal problems (Gray, 1998) - face the challenge of doing so without necessarily imitating Western cultural norms of behavior. Moran and Ghoshal (1999) outline how institutional pluralism - which they define as the coexistence of both firms and markets, is essential to this process of development. We build on their insight and suggest that one important source of pluralism is the diversity of organizational forms that firms' founders can potentially draw upon.

Our findings suggest that subsidiaries of Western MNCs provide a social context that fosters a type of behavior across a market interface that is quite different from that of business groups. Appropriate behavior in a business group context seems to legitimize and enact the importance of particularistic ties, which is the exact opposite of western MNCs that focus on universalistic ties. Yet business groups are a force for innovation and efficiency in emerging Asian economies (e.g. Mahmood, Chung & Mitchell, 2012; Siegel and Choudhury, 2012) – a powerful force for the application of rational management principles. One way to reconcile these apparently conflicting ideas is to consider the possibility that business groups as an organizational form might be a way for eastern societies to transition to modernity without necessarily imitating western cultural norms of behavior. In essence the organizational form of the business group represents a blending of modern (rational) management practices over a taken-for-granted framework that stresses particularistic interactions – which may well derive from traditional patterns of cultural symbols and material practices, including assumptions, values, and beliefs (Friedland & Alford, 1991; Thornton, Ocasio & Lounsbury, 2012), by which corporate leaders' behavior is regulated.

Future research directions

This study's findings are a useful starting point for future research along several paths. First, if our conjecture (based on some evidence) that business groups act as a repositories for traditional institutional practices – thereby allowing such practices to persist – is accurate, we should expect substantial differences in the human resource practices across business group and multinational subsidiaries. For instance, we would expect more nepotistic top management teams in business group-affiliated firms than in MNC subsidiaries. Second, a logical follow-on research question is to identify other important foci that might facilitate formation of high-quality interpersonal network pathways. For instance, co-membership in voluntary organizations or co-membership in prestigious work organizations might be

important ways to gain access to private information in contemporary India. Third, an important question is to examine how analysts' ties to other actors in the focal firm's value chain, such as suppliers, customers and rivals may act in concert with ties to the focal firm in driving analysts' forecast accuracy.

In addition, it is possible that English language proficiency might influence the extent to which CEOs and analysts' use regional Indian languages as important foci of affiliation; hence understanding how English language use interacts with regional Indian languages in formation and development of embedded network ties is another way forward.

Lastly, it would be useful to examine whether our results generalize to other Asian emerging economies such as Bangladesh, Indonesia, Malaysia, Pakistan or Sri Lanka which are significantly diverse in their traditional basis of affiliation and are also grafting modern institutions such as university systems on to their existing institutional infrastructure. These societies are at different stages of economic development and with different institutions, so we should expect to see some differences in individuals and organizations' behaviors from the findings presented here, which may help us further explore how the changing bases of social affiliation impact individuals' economic actions in emerging Asia.

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Figure 1:
Interaction Effects between CEO-analyst School Tie and Moderators on Analyst Forecast Accuracy

Figure 1a: Interacting with post-reform generation CEO

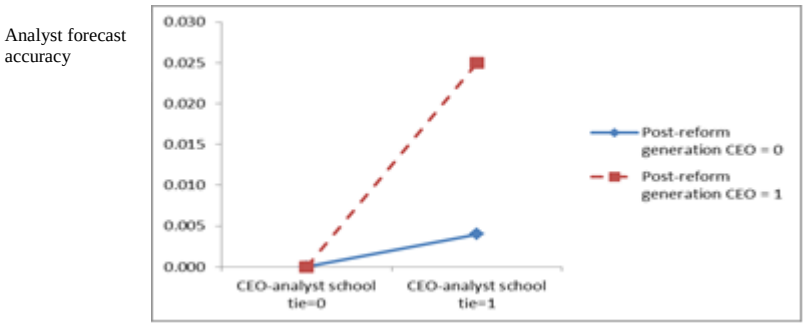

Figure 1b: Interacting with MNC organization form

Figure 1c: Interacting with BG organization form

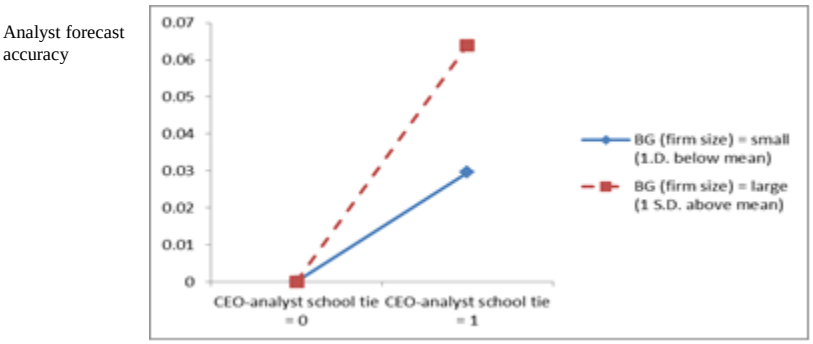

Table 1:
Means, Standard Deviations and Correlations[a]

	Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Forecast accuracy	-0.01	0.03	1.00												
2	CEO-analyst caste tie	0.18	0.20	0.09	1.00											
3	CEO-analyst language tie	0.15	0.24	0.05	0.25	1.00										
4	CEO-analyst school tie	0.03	0.17	0.02	0.01	-0.00	1.00									
5	Post-reform generation CEO	0.04	0.20	0.05	-0.00	-0.05	-0.02	1.00								
6	MNC firm	0.16	0.37	0.06	-0.07	-0.04	-0.01	-0.09	1.00							
7	Business group (BG) firm	7.13	5.74	0.01	0.02	0.01	0.02	0.09	-0.55	1.00						
8	Firm size	10.67	1.51	-0.16	0.01	0.05	-0.02	-0.11	-0.13	-0.17	1.00					
9	Prior firm financial performance	0.10	0.09	0.23	-0.05	-0.03	-0.03	-0.04	0.12	0.18	-0.38	1.00				
10	Outsider ratio	0.55	0.14	0.01	0.02	0.03	-0.07	0.03	-0.22	0.19	0.08	0.03	1.00			
11	Foreign institutional ownership	17.69	12.65	0.11	0.12	0.06	0.02	0.10	-0.16	0.07	0.18	-0.00	0.08	1.00		
12	Information environment	17.60	10.59	0.02	0.00	0.05	-0.02	0.04	-0.13	0.40	0.21	0.24	0.12	0.02	1.00	
13	State-owned firm	0.14	0.35	-0.09	0.01	0.03	-0.01	-0.09	-0.18	-0.51	0.51	-0.29	-0.05	-0.02	-0.23	1.00
14	No. of firms covered by the analyst	8.28	7.37	0.06	0.10	-0.06	-0.01	0.04	-0.01	-0.02	-0.05	0.01	0.00	0.03	-0.06	-0.06
15	Analyst's firm-specific forecasting exp	2.07	1.34	0.03	0.03	0.00	-0.02	0.00	0.03	-0.04	0.12	0.00	0.05	0.02	0.05	0.02
16	Total experience as an analyst	3.99	2.47	-0.04	0.04	0.04	0.05	0.03	0.07	-0.02	0.13	-0.03	-0.03	-0.01	0.18	-0.02
17	Forecast frequency	6.51	5.93	0.11	0.04	-0.03	0.09	-0.02	-0.06	0.03	0.07	0.03	0.08	0.06	0.01	0.04
18	CEO change	0.07	0.26	-0.12	-0.06	-0.01	-0.01	-0.06	0.11	-0.16	0.14	-0.08	-0.05	-0.08	-0.11	0.16
19	Star analyst	0.12	0.33	0.01	0.05	0.03	0.12	-0.04	0.01	-0.02	0.01	-0.03	-0.08	-0.02	-0.12	0.08
20	Analyst's high status caste	0.78	0.29	0.00	0.25	0.03	0.04	0.03	-0.18	0.05	0.06	-0.09	0.07	0.03	-0.07	0.09
21	Brokerage house size	17.80	15.68	-0.02	-0.10	-0.04	-0.02	0.01	-0.05	-0.01	-0.04	-0.02	-0.07	-0.04	-0.02	-0.02
22	Brokerage house's industry coverage	27.59	11.94	-0.01	0.01	0.01	0.02	0.01	-0.02	-0.06	0.06	-0.08	-0.13	-0.00	-0.09	0.00
23	Brokerage house-firm relationship	0.03	0.25	0.02	-0.01	-0.02	-0.02	-0.02	-0.03	0.03	0.00	-0.00	0.02	0.06	-0.02	-0.01
24	Forecast horizon	4.63	1.03	-0.14	-0.09	-0.04	0.03	-0.02	-0.01	0.03	-0.09	0.05	-0.03	-0.02	-0.01	-0.04
25	Indian CEO	0.93	0.25	-0.02	0.24	0.17	0.05	0.06	-0.46	0.23	0.08	-0.13	0.15	0.16	0.15	0.11
26	Indian analyst	0.94	0.24	0.03	0.22	0.16	0.03	-0.01	0.01	0.05	-0.07	0.08	0.02	-0.04	-0.01	-0.04
27	CEO's undergrad. education	0.31	0.46	-0.05	-0.09	-0.04	-0.07	-0.09	0.07	-0.17	-0.09	0.13	-0.06	0.17	-0.19	0.07
28	CEO's postgrad. education	0.45	0.50	-0.04	0.04	0.05	-0.11	-0.10	0.05	-0.03	-0.06	0.08	0.02	-0.17	0.10	-0.04
29	Analyst's undergrad. education	0.56	0.50	0.01	-0.03	0.01	-0.16	0.00	0.02	-0.13	0.01	-0.04	0.00	0.05	-0.13	0.08
30	Analyst's postgrad. education	0.47	0.50	-0.04	0.00	0.01	-0.14	0.03	0.02	-0.09	0.01	-0.04	0.01	0.03	-0.05	0.04

	Variables	Mean	s.d.	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
14	No of firms covered by the analyst	8.28	7.37	1.00															
15	Analyst's firm-specific forecasting exp	2.07	1.34	0.12	1.00														
16	Total experience as an analyst	3.99	2.47	0.09	0.50	1.00													
17	Forecast frequency	6.51	5.93	0.18	0.22	0.12	1.00												
18	CEO change	0.07	0.26	-0.01	0.04	0.06	-0.03	1.00											
19	Star analyst	0.12	0.33	0.02	0.19	0.24	0.14	0.01	1.00										
20	Analyst's high status caste	0.78	0.29	0.08	0.10	0.08	0.09	-0.04	0.15	1.00									
21	Brokerage house size	17.80	15.68	-0.16	-0.04	-0.07	-0.09	0.03	-0.04	-0.05	1.00								
22	Brokerage house's industry coverage	27.59	11.94	0.18	0.19	0.16	0.14	0.04	0.13	0.12	0.46	1.00							
23	Brokerage house-firm relationship	0.03	0.25	-0.04	-0.00	-0.03	-0.04	-0.03	-0.02	0.03	-0.02	-0.03	1.00						
24	Forecast horizon	4.63	1.03	-0.11	-0.21	-0.12	-0.34	0.00	-0.10	-0.05	-0.01	-0.16	0.02	1.00					
25	Indian CEO	0.93	0.25	0.02	-0.04	-0.04	0.05	-0.19	-0.03	0.33	-0.02	-0.09	0.03	-0.02	1.00				
26	Indian analyst	0.94	0.24	0.22	0.13	0.23	0.06	0.01	0.09	0.24	-0.17	0.19	-0.02	-0.08	-0.07	1.00			
27	CEO's undergrad. education	0.31	0.46	0.01	-0.04	-0.03	0.01	-0.00	0.00	-0.09	0.06	0.06	-0.03	0.01	-0.21	-0.02	1.00		
28	CEO's postgrad. education	0.45	0.50	0.01	-0.02	0.05	-0.03	0.01	0.02	0.04	0.01	0.01	-0.01	-0.03	0.01	0.02	-0.01	1.00	
29	Analyst's undergrad. education	0.56	0.50	0.15	-0.07	-0.05	-0.10	0.01	-0.19	-0.03	0.02	-0.05	0.07	0.02	0.01	-0.08	0.03	-0.02	1.00
30	Analyst's postgrad. education	0.47	0.50	0.15	-0.11	-0.08	-0.08	0.04	-0.14	-0.08	0.04	-0.08	0.04	0.07	0.01	-0.16	0.00	0.02	0.58

[a] n = 1552; correlation coefficients with a magnitude greater than 0.05 are significant at the $p < .05$ level

Table 2
Effects of CEO-analyst Ties on Analyst Forecast Accuracy[a]

VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
CEO-analyst caste tie		0.007*	0.007*	0.006*	0.006*	0.006*
		(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
CEO-analyst language tie		0.005*	0.005*	0.006*	0.006**	0.006**
		(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
CEO-analyst school tie		0.004+	0.004+	0.004*	0.003+	0.003*
		(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Post-reform generation CEO	0.004+	0.005+	0.005*	0.005+	0.005+	0.006*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
CEO-analyst caste tie			-0.014+			-0.012+
X Post-reform generation CEO			(0.009)			(0.009)
CEO-analyst language tie			0.008			0.005
X Post-reform generation CEO			(0.010)			(0.010)
CEO-analyst school tie			0.015*			0.020**
X Post-reform generation CEO			(0.008)			(0.008)
MNC firm	0.001	0.000	0.001	0.001	0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)
CEO-analyst caste tie				0.001		-0.003
X MNC firm				(0.008)		(0.009)
CEO-analyst language tie				-0.012**		-0.007
X MNC firm				(0.005)		(0.006)
CEO-analyst school tie				-0.017***		-0.008+
X MNC firm				(0.004)		(0.005)
Business group (BG) firm	-0.004+	-0.004+	-0.004+	-0.004+	-0.004	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
CEO-analyst caste tie					-0.005	-0.005
X BG firm					(0.005)	(0.005)
CEO-analyst language tie					0.010**	0.007*
X BG firm					(0.003)	(0.004)
CEO-analyst school tie					0.011**	0.009*
X BG firm					(0.004)	(0.004)
Firm size	-0.002*	-0.002*	-0.002*	-0.002**	-0.002**	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Prior firm financial performance	0.053**	0.055***	0.054***	0.053***	0.054***	0.053***
	(0.018)	(0.017)	(0.018)	(0.017)	(0.017)	(0.017)
Outsider ratio	0.001	0.002	0.002	0.002	0.003	0.003
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Foreign institutional ownership	0.002*	0.003	0.002*	0.002*	0.002*	0.002*
	(0.001)	0.002	(0.001)	(0.001)	(0.001)	(0.001)
Information environment	0.000+	0.000+	0.000+	0.000+	0.000+	0.000+
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
State-owned firm	0.002	0.000	0.002	0.002	0.002	0.002
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)
No of firms covered by the analyst	0.000+	0.000*	0.000*	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Analyst's firm-specific forecasting exp	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Total experience as an analyst	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Forecast frequency	0.000+	0.000+	0.000+	0.000+	0.000+	0.000+
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CEO change	-0.007+	-0.007+	-0.007+	-0.007+	-0.007+	-0.007+
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Star analyst	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Analyst's high status caste	0.002	0.002	0.002	0.003	0.002	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)

Brokerage house size	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Brokerage house's industry coverage	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Brokerage house-firm relationship	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Forecast horizon	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Indian CEO	-0.003	-0.005	-0.006	-0.004	-0.005	-0.005
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
Indian analyst	-0.001	-0.004	-0.004	-0.004	-0.004	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
CEO's undergrad. education	-0.005+	-0.004+	-0.005+	-0.005+	-0.005+	-0.005+
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
CEO's postgrad. education	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Analyst's undergrad. education	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Analyst's postgrad. education	-0.002*	-0.003*	-0.002*	-0.003*	-0.003*	-0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year dummies	Included	Included	Included	Included	Included	Included
Model Indices						
F-statistic	9.82***	9.21***	8.75***	8.93***	8.96***	7.89***
R-squared	0.189	0.192	0.196	0.199	0.200	0.201
Observations	1,552	1,552	1,552	1,552	1,552	1,552

[a] Unstandardized regression coefficients. We report robust standard errors adjusted using a two-dimensional clustering procedure at the firm and analyst levels.
One-tailed tests reported. + p < .10 * p < .05 **p < .01 *** p < .001

Biographical Sketch

Guoli Chen is Assistant Professor of Strategy at INSEAD. He received his Ph.D. in strategic management from Pennsylvania State University. His research examines the influence of CEOs, executives and boards of directors on firms' strategic choices and organizational outcomes, as well as the dynamics in the CEO-board relationship and the interaction between executives and financial intermediaries. He also studies organizational growth, renewal and corporate development activities.

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