Building capabilities for international operations through networks: a study of Indian firms

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Abstract
In this study we seek to explain how firms from emerging markets build capabilities to operate in international markets through learning from parental networks. The building of these capabilities is of particular interest, as firms from emerging markets may not necessarily possess the monopolistic advantages commonly referred to in IB literature, which allow a firm to succeed in international markets. Using lagged cross-sectional regression models on a sample of 794 Indian firms, we found that firms draw on the international experience of their parental and foreign networks to build such capabilities. Findings also indicate that network scope is beneficial for increasing exposure to international markets only in the case of networks that are either small or medium sized. Additionally, we found that firms lacking market power in their home market benefit through foreign partnerships when internationalizing operations.
Journal of International Business Studies (2007) **38,** 541–555.
doi:10.1057/palgrave.jibs.8400280

Introduction
Emerging markets are countries experiencing rapid economic development, with their economic institutions concurrently undergoing rapid institutional adaptation to free-market ideologies (Arnold and Quelch, 1998; Hoskisson *et al.*, 2000). Prior to the last decade, these markets were in most instances characterized by a lack of international competition and a domination of state-owned firms in the economy. Goods and services were usually characterized by limited choices, and competition was generally low in most product segments (Aulakh *et al.*, 2000). In the most recent decade these markets have undergone a radical change, with increasing globalization and an openness to international competition: hence the term *emerging market*. This influx of foreign competition and newer opportunities brought by globalization has led many firms in emerging markets to seek international markets.

 Despite the recent motivation to seek international markets, firms from these markets (compared with firms in developed countries) face several constraints in pursuit of their international expansion strategy. First, since they were located in environments that had previously offered institutional protection from foreign competition to local firms, emerging market firms developed

products and services independent of international markets, making the transition process very difficult (Eriksson *et al.*, 1997). Second, unlike established multinational firms (MNCs), the competitive advantages of these firms are based on price competition rather than on leading edge technology or product differentiation (Kumar and McLeod, 1981; Lall, 1983; Wells, 1983). Therefore, while these firms possess some resources, they are not of the kind leading to monopolistic advantages in international markets. Third, since these firms' focus was on low-cost products, they operated as suppliers to other manufacturers or depended on third-party distributors to distribute their products. As a result, they lack requisite international experience compared with established firms in developed countries (Vernon-Wortzel and Wortzel, 1988; Brouthers *et al.*, 2005). Finally, these firms are relatively small in size compared with developed country rivals, and are usually handicapped by limited organizational resources. Moreover, despite these handicaps, they also face the costs and perils of international operations due to liabilities of foreignness (Zaheer, 1995). Therefore there is a need for these firms to learn and develop the capabilities to operate abroad (Barkema and Vermeulen, 1998).

Using a sample of 794 Indian firms as the context of an emerging market, we seek to explore how these firms develop capabilities to operate abroad. Using the Uppsala model of internationalization and network theory as a theoretical basis to build our arguments, we show how firms in an emerging market context can exploit parental networks to develop capabilities for international operations. As these emerging market firms are in the early stages of internationalization, the Uppsala model offers a valid context for explaining the internationalization process of these firms (Johanson and Vahlne, 1977, 1990). In this study, we test the following two empirical questions:

(1) What is the relationship between underlying firm characteristics and internationalization in the emerging market context?
(2) How is this relationship facilitated by parental network capabilities?

This study will contribute to the body of literature in internationalization by focusing on firms with nascent international operations within the context of emerging markets. A number of studies exist in the literature that examine the influence of parental networks and internationalization using

Japanese (Chang, 1995; Banerji and Sambharya, 1996; Belderbos and Sleuwaegen, 1996, 2005) and Korean business groups (Guillen, 2002, 2003). These earlier studies focused on well-established firms with significant ownership advantages, and were based on more advanced economies. Therefore the current study findings complement extant research, owing to its focus on firms with limited exposure to international markets as well as a differing environmental context. The study findings have the potential to offer impetus to internationalization theories by bringing to light an additional facet that has been hitherto unexplored, leading to significant implications for theory, practice and public policy.

Theoretical background: process of internationalization

Internationalization refers to the degree to which a firm's sales revenue or operations are conducted outside its home country. Several models exist that seek to explain the process of internationalization, and have been elaborated in Andersen (1993) and more recently in Fletcher (2001). These process models can be classified into three groups: the Uppsala model (e.g., Johanson and Wiedersheim-Paul, 1975, Johanson and Vahlne, 1977); the network model (e.g., Hakansson, 1982, Johanson and Mattsson, 1987, 1988; Easton, 1992); and the innovation model (e.g., Bilkey and Tesar, 1977; Cavusgil, 1980; Czinkota, 1982; Reid, 1981). We chose to focus on the first two models for the conceptual rationalizations in this paper with two reasons in mind. First, the Uppsala model is valid for firms of any size, in contrast to the innovation model, which is bound to small or mid-sized firms (Andersen, 1993; Fletcher, 2001). Second, the network model allows for incorporation of one of the critical institutional contexts of emerging markets, namely, the influence of external network members on firm internationalization. While these models have been reviewed in the literature in detail (Axelsson and Easton, 1992; Andersen, 1993), recent examples of studies offering empirical support for core assumptions of these models include Eriksson *et al.* (1997, 2000), Chetty and Eriksson (2002), Hohenthal *et al.* (2003) (Uppsala model), and Chetty and Holm (2000), Hadley and Wilson (2003), and Welch and Luostarinen (1993) (network model).

In the Uppsala model, a firm gradually increases its international involvement through development of knowledge of foreign markets (Johanson and Vahlne, 1977). The underpinning of this model

is based on the theory of the growth of the firm (Penrose, 1959) and the behavioral theory of the firm (Cyert and March, 1963; Aharoni, 1966). The Uppsala model claims that internationalization is an incremental process, and explains it through the progression of increasing experiential knowledge (Eriksson *et al.*, 1997). The core idea behind this process model is the interplay of two elements, namely, the development of knowledge of international operations and the increasing propensity for organizations to commit to international operations. Exposure to international operations leads to greater development of knowledge about foreign operations, leading to further increases in commitments to such operations, and so on (Johanson and Vahlne, 1977).

One of the core ideas of the Uppsala model is that a prerequisite for international operations is the development of knowledge of international markets. Such knowledge can be classified into two types: objective knowledge, which is easily acquired, and experiential knowledge that firms can acquire only through engaging in international operations (Johanson and Vahlne, 1977). Eriksson *et al.* (2000) describe this knowledge as 'firms' learning capacity' (p. 38).[1] Although the accumulation of such knowledge and capabilities is costly and takes time, firms internationalizing without them are likely to commit excessive errors and incur significant costs due to liabilities of foreignness. In such circumstances, firms may find international operations to be a frustrating and unviable proposition, and thus give up.[2]

One important resource that some firms in emerging markets use to acquire such knowledge is their links to a parental network. For firms affiliated with parental networks, internationalization knowledge can potentially be acquired from other members in the network. They could tap into and learn from current international activities taking place at business networks, a source of critical knowledge for internationalization (Banerji and Sambharya, 1996; Welch and Welch, 1996; Holm *et al.*, 1999; Chetty and Eriksson, 2002; Guillen, 2002, 2003). Access to such internationalization knowledge will facilitate the acquisition of business and institutional knowledge compatible with the firm's internal resources and competencies (Eriksson *et al.*, 1997, 2000). The underlying premise of this argument is based on the earlier work done on the Uppsala model (Johanson and Vahlne, 1977) and the network approach to internationalization (Johanson and Mattsson, 1988). In

their network approach, Johanson and Mattsson postulate two requirements for the process of internationalization: the need for gradual development of market knowledge, and the need to learn from other firms in their network. In their model, a firm internationalizes through gradual development of new positions, increasing resource commitments, and coordination across networks. While their work is based on international marketing networks, we believe their model can be extended to other contexts (e.g., business groups in emerging markets), and this will form the underlying premise for this paper. Other studies using the resource-based or dynamic capabilities perspective from the strategic management literature (Chang, 1995; Guillen, 2002, 2003) support a similar logic of incremental learning in the international expansion of Japanese and Korean business groups.

While the Uppsala model along with the network model forms the theoretical underpinning of this study, there are several acknowledged shortcomings of the Uppsala model (Johanson and Vahlne, 1990). First, it treats firms as passive or, at best, reactive (Cavusgil, 1980), ignoring managerially proactive or risk-taking behavior. Second, this model does not offer insights into international expansion of firms with extensive internationalization experience, but focuses on the early stages of internationalization (Melin, 1992). Finally, the Uppsala model's underlying assumption is that there is a 'deterministic sequential' (Melin, 1992) progression of events in the internationalization process, not allowing for the possibility of leap-frogging steps, as evidenced by the case of 'born globals' (Sharma and Blomstermo, 2003; Knight and Cavusgil, 2004).

While the first shortcoming is an inherent assumption of the Uppsala model, and therefore also of this study, the latter two shortcomings are well addressed by particular facets of the Indian environmental context (the following section provides a brief introduction). For instance, most emerging market firms do not have extensive international experience and are engaged mostly in the early stages of internationalization. Additionally, this study's sample is focused on traditional manufacturing firms, and is not representative of the 'born globals', defined by Knight and Cavusgil (2004) as 'business organizations that, from or near their founding, seek superior international business performance from the application of knowledge-based resources to the sale of outputs in multiple countries' (p 124). Therefore, based on the above rationalizations

and the context of the study sample, we believe that the Uppsala and network models of internationalization serve as an ideal conceptual framework for understanding how firms from the emerging market context build capabilities for international operations.

Indian environmental context

The economic history of India, since its independence in 1947, can be divided into two major phases. In the first, the *post-independence phase* (1947–1991), the plan was to modernize the agrarian economy into a self-sufficient industrial state through five-year plans. Its primary goals were poverty alleviation, development of industrial infrastructure and import substitution to save foreign exchange and reduce foreign dependence. To achieve these goals, the state controlled and monopolized many segments of industry through state-owned firms, investing heavily in many sectors such as steel, power, heavy machinery and transportation. At the same time, protection, subsidies, special exceptions and tax breaks were offered for small business in many segments of the industry. Industrial production and imports were tightly controlled through various licensing and quota requirements, leading this period to be referred to as 'License Raj'. Foreign firms were permitted to operate in selected industries with similar restrictions. The institutional environment of regulation, licensing, and limited competition permitted local firms to operate without developing unique competencies, and created an unviable scale for competing in international markets. Most firms had a ready captive market for their products, while production was restricted, allowing a substantial pent-up demand to exist (Arnold and Quelch, 1998; Ghemawat and Khanna, 1998).

This heavy hand of the state led to mixed results, and by late 1990 the Indian government faced serious economic crisis, coming close to default. As a result, then Prime Minister Narasimha Rao in 1991 initiated the *liberalization phase* (1991–present). This second phase started free market reforms, which involved minimization of governmental restrictions through reduction or removal of regulation and licensing hurdles, privatization of the state sector, and opening up of most segments of the economy to foreign competition. This liberalization phase continues through subsequent regimes, and even today remains not fully complete owing to political compulsions in Indian coalition politics. A key paradigmatic shift in this phase relative to the earlier period is an emphasis on export-led growth from an import substitution orientation, market competition in most sectors from a state control, and from a trade barriers mentality to open market orientation. While still far from the ideal of an open market economy, the Indian economy in recent years has made rapid strides toward this end of the spectrum (Joshi and Little, 1996; Vachani, 1997).

Hypothesis development

Firm strategy

While the specific changes described above may differ from those in other emerging markets, this pattern of change, wherein a closed economy has opened itself to foreign competition, is a feature of many emerging markets during the last two decades. The opening of economies and the continuing globalization of markets have created many new opportunities for firms in these markets. Certainly some segments (e.g., software and outsourcing services in the case of India; garments and consumer products in the case of China) have greatly benefited from the opening of these economies. However, opening of the home market also requires that local firms face competition with MNCs, forcing many local manufacturing firms to seek international markets to gain benefits of newer market opportunities and offset the institutional disadvantages faced by these firms. The ability to exploit such international opportunities is circumscribed by the degree to which a firm's possession of valuable resources and competencies that are compatible with those needed abroad (Madhok, 1996). Hence these manufacturing firms need to acquire a cost-based or differentiation-based advantage to compete successfully in international markets (Porter, 1985).

While strategic management literature supports both approaches for a firm's secure competitive advantage, these firms are better off choosing a cost-based strategy wherein firms compete on market power and efficiency-based advantages. We premise that a differentiation-based advantage may be unviable in the international context for these manufacturing firms because they have evolved independent of international markets and foreign competitors. For instance, earlier policies of market protection encouraged firms to use imported (and in many instances, outdated) technologies which were adapted to domestic markets, limiting development of new technological capabilities (Lall,

1983; Wells, 1983). Few instances exist where emerging market firms did create unique assets; these innovations were limited to making adaptations and improvements on existing technology for the emerging market context, and were unlikely to offer the sustainable competitive advantages required to succeed in advanced markets (Lall, 1983). Hence, while these firms may have differentiation advantages suitable for the local market, we anticipate that the level of differentiation would not be adequate for international operations. Additionally, given the lack of exposure of these firms to international markets, it is unlikely that such firms will be able to recognize and understand customer needs adequately (Eriksson *et al.*, 1997) to allow for development of meaningful differentiation strategies in a short period of time. Historically, even firms that exported their products to international markets operated as part suppliers to other manufacturers or depended on third-party distributors (Vernon-Wortzel and Wortzel, 1988; Brouthers *et al.*, 2005). Empirical research is also supportive of the notion that competitive advantage of emerging market firms in international markets does not lie with differentiation advantages such as brand names or technology (Kumar and McLeod, 1981; Wells, 1983). Therefore we propose:

> **Hypothesis 1**: The extent of differentiation advantages held by a firm will have no relationship with the extent of internationalization of a firm.

On the other hand, firms from the emerging market context that choose a cost-based strategy using size-based and efficiency-based advantages will do better in international markets for three reasons. First, previous research has indicated that a strong domestic market presence is critical for foreign market success (Rangan and Drummond, 2004). For instance, firms can minimize the risk of failure by staying with products where they possess competitive advantages over domestic rivals (Chang, 1995). Second, the current environment favors this strategy, as these firms are blessed with an abundant supply of low-cost factors which offer them an opportunity to become global suppliers of labor-intensive products to advanced countries. Third, the 'country of origin effect' (Sethi and Elango, 1999; Andersen and Chao, 2003) of these emerging market firms is not supportive of the high-quality image required for marketing differentiated products. For example, countries such as Germany and Japan have developed a reputation for exceptional

quality or technological engineering in many industry segments, which provide a positive halo effect for firms from such countries. Unfortunately, firms from emerging markets do not have this luxury. Furthermore, previous research by Aulakh *et al.* (2000) on emerging market firms has shown a cost leadership strategy to be strongly related to export performance of firms in both developed and emerging markets. Therefore firms emphasizing cost-based strategies are likely to be more successful in international markets. Hence we propose the following two hypotheses:

> **Hypothesis 2a**: The extent of market power held by a firm will be positively related to the extent of internationalization of a firm.

> **Hypothesis 2b**: The extent of operational efficiency of a firm will be positively related to the extent of internationalization of a firm.

Network characteristics
The above discussion focused on what type of firm-specific advantages will allow a firm to increase its exposure in international markets, while this section focuses on the impact of a firm's parental networks and foreign partners. In this study, we visualize business groups as a network of internationalization knowledge and connections that member firms can tap, in order to exploit opportunities. Business groups represent confederations of legally independent firms bound together by a united maze of economic and social ties (Khanna and Rivkin, 2001), and are a common phenomenon in many emerging markets, controlling a substantial portion of a country's largest firms (Khanna and Palepu, 1997). Firms affiliated with a business group share capital, products, labor and information internally among the group members (Khanna and Rivkin, 2001). Khanna and Palepu (2000) claim that Indian firms affiliated with such business groups outperform firms that are not affiliated, as these groups help fill in institutional voids in product–capital–labor markets, regulation, and contract enforcement. To the contrary, Chacar and Vissa (2005) report that firms affiliated with business groups tend to have longer persistence of poor performance compared with independent firms. One potential reason offered is that business group members may support these poorly performing affiliates to avoid being associated with failure or exit. Their study remains supportive of the importance of business groups for resource sharing.

However, empirical studies based on other emerging markets have found that there is a positive impact of group membership on firm performance (Khanna and Rivkin, 2001). Peng and Luo (2000) provide empirical evidence on the importance of such network ties in an emerging economy such as China. They report that such ties are necessary (if not a sufficient condition) for firm performance. Therefore business groups can be seen as a 'strategic network' providing member firms with access to information, knowledge, resources, markets, and technologies (Gulati et al., 2000).

In addition to internationalization knowledge, these networks can provide member firms with important connections facilitating internationalization of operations (Welch et al., 1998). For instance, member firms can readily draw on their existing foreign relationships with customers, partners, suppliers, government officials, and intermediaries (Welch and Welch, 1996). Support for this notion can be derived from the concept of 'social embeddedness' (Granovetter, 1985), wherein it is argued that business ties are likely to take place within the context of pre-existing social relationships. Welch and Welch (p 14) refer to such resources as the 'strategic foundation', and claim that such networks are a critical link for successful internationalization. The importance of such introductions and connections to firms in a network has been offered by Uzzi (1996), Gulati (1999) and Burt (2000). First, prospective foreign contacts need a way to learn of the existence of such a firm and its specific needs. Second, they need reliable information about the inherent nature of the business partner (e.g., is the partner trustworthy?). Third, the potential foreign partner should also be able to trust the firm attempting to internationalize. Therefore such parental network support can be seen as a critical resource for a firm, as it reduces search costs, transaction costs, contracting costs, ambiguities, moral hazards, and opportunism (Barney and Hansen, 1994; Gulati, 1999; Gulati et al., 2000). These parental network connections could play a facilitative role in various business contexts, allowing such firms to gain trust, information, knowledge and leverage in international markets where none previously existed (Pfeffer and Salancik, 1978). Such resources are commonly referred to as network resources and are not generally commonly available to those outside the network (Grandori and Soda, 1995; Gulati, 1999).

While these resources, in terms of knowledge and connections, are critical for internationalization,

we recognize that their utility would vary for the particular firm, contingent on the nature of the country and product markets sought. However, despite this limitation, such resources acquired from network members would serve as a quick lesson, allowing for easy modification and adaptation. Firms can use acquired capabilities from other network members and modify approaches based on solutions that have worked in the past for other members (Cyert and March, 1963). Therefore, in order to develop international operations quickly, firms need to have access to prior knowledge in dealing with differing institutions, as well as differing managerial approaches needed for such operations. This assertion is similar to the concept of absorptive capacity introduced by Cohen and Levinthal (1990), wherein they found that an organization needs prior knowledge to assimilate new knowledge. Similarly, a lead or a connection in international markets may not produce direct business outcomes, but could potentially result in opportunities with other network members in a foreign country. Therefore we propose that:

Hypothesis 3: The extent of international experience of the parental network will be positively related to the extent of internationalization of a firm.

The above hypothesis focuses on the degree of international experience held by other members in a parental network. We next look at the extent of variation among the network members, namely, network scope. In the Uppsala model, a firm's current experience and knowledge of international markets drive new opportunities, leading to new 'market discoveries' (Hohenthal et al., 2003), which further drives subsequent international expansion. However, when network members discover new market opportunities through international operations, such discoveries can be exploited only if network members have the potential to supply the new customer with products and services desired. Networks with a narrow scope may find that they do not have the competence within the network to exploit the discovery. This point of view can be supported using the law of requisite variety,[3] a concept borrowed from the field of cybernetics (Ashby, 1956). Applying this law to a network would mean the larger the variety of options in the network, the greater the ability of the network to respond to opportunities. Studies done in other organizational contexts have shown that network

heterogeneity leads to greater task effectiveness through variety optimization (e.g., faster rate of growth: Powell *et al.*, 1996; innovation: Hargadon and Sutton, 1997). Additionally, this importance of non-redundancy (i.e., variety) in a network for growth and survival is also validated in broader social contexts (Llobrera *et al.*, 2000). This brings us to our fourth hypothesis:
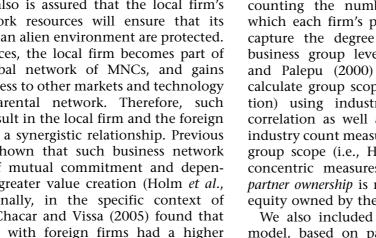
> **Hypothesis 4**: The degree of parental network scope will be positively related to the extent of internationalization of a firm.

While network benefits articulated so far are based on the parental network's relationship with potential unstructured international customers or partners, another way to tap international markets is through the usage of foreign partners. In this option, local firms seek out foreign partners (usually MNCs) and encourage them to take an ownership interest. This type of relationship can be explained by the notion of *bridging ties*, where the local firm is connected to sources of information and opportunities unavailable from other parental network contacts (McEvily and Zaheer, 1999). In this symbiotic relationship with firms in local business groups, the foreign partner not only has access to a local firm wherein it has financial interests, but also is assured that the local firm's parental network resources will ensure that its investments in an alien environment are protected. In such instances, the local firm becomes part of the larger global network of MNCs, and gains preferential access to other markets and technology outside its parental network. Therefore, such investments result in the local firm and the foreign partner having a synergistic relationship. Previous studies have shown that such business network connections of mutual commitment and dependence lead to greater value creation (Holm *et al.*, 1999). Additionally, in the specific context of Indian firms, Chacar and Vissa (2005) found that firms affiliated with foreign firms had a higher persistence of superior returns. This leads us to our final hypothesis:

> **Hypothesis 5**: The extent of foreign partner ownership will be positively related to the extent of internationalization of a firm.

Research methodology
The dependent variable for Hypotheses 1–5, *firm internationalization*, is measured as the ratio of a firm's revenue from foreign countries divided by total sales. This measure allows us to capture the extent and importance of exposure to foreign markets. This practice of measuring international operations using the ratio of foreign sales to total sales is consistent with many previous studies on internationalization (e.g., Tallman and Li, 1996; Geringer *et al.*, 2000; Capar and Kotabe, 2003). Similarly, the key explanatory variable of interest, parental *network internationalization* (i.e., business group), is measured using the ratio of a firm's parental group sales revenue from foreign countries divided by the total group sales revenue with the exclusion of the focal firm.

Of the remaining explanatory variables, *marketing intensity* and *research intensity* serve as proxies for differentiation advantages, based on prior research (e.g., Miller, 1988). In order to measure cost-based strategy, we used previous operationalizations of Segars and Grover (1995) and Elango (2000). *Market power* captures the size-related advantage held by a firm relative to its rivals. This variable is operationalized as firm assets divided by average assets of firms within the industry. *Operational efficiency* measures the extent to which the firm can carry out its core value activities in an effective manner, and is a ratio calculated as total sales divided by cost of sales. Parental *network scope* is measured by counting the number of distinct industries in which each firm's parent network is involved, to capture the degree of diversity present at the business group level, as argued earlier. Khanna and Palepu (2000) used a similar measure to calculate group scope (i.e., group-level diversification) using industry count. They claim high correlation as well as predictive validities in the industry count measure and alternative measures of group scope (i.e., Herfindahl index, entropy and concentric measures: see pp 873, 876). *Foreign partner ownership* is measured as the percentage of equity owned by the foreign partner in the firm.

We also included two control variables in the model, based on past research. *Age* of the firm needed to be controlled for, as it has been argued that older firms have greater inertia due to proliferation of rules and organizational resistance, and are less likely to be willing to embrace newer market opportunities (Hannan and Freeman, 1984). We operationalize *age* as the number of years the company has existed, and expect a negative relationship with age and internationalization. The second variable we control for is firm *product diversification*, as the influence of diversification on

internationalization has been theoretically argued and empirically established in the literature (Hitt *et al.*, 1994). For instance, Hitt *et al.* (1997) argue that firms with experience in managing diversified product lines will be able to take advantage of this experience in managing international operations and therefore anticipate a positive relationship between a firm's diversification and internationalization. We measure a firm's *product diversification* using the Herfindahl Index. The Herfindahl Index is calculated as $1 - \Sigma p_i^2$, where p_i represents the percentage of a firm's net sales from a product line i (Elango, 2004).

The sample of firms used in this study came from a broad spectrum of manufacturing industries and business group sizes. To control for *industry effects*, each of the major categorical manufacturing industry types was dummy-coded into five industry groups: electrical and electronics, food, primary manufacturing, process, and secondary manufacturing. This coding was done in order to differentiate the type of activities carried out by them in the value chain. To control for parental network size, we categorized the business groups as small, medium, and large using the classification of Khanna and Palepu (2000: 875). Small-size groups (*Small Group Dummy*) were dummy-coded 1 for those with fewer than eight affiliates, 0 otherwise. Medium-size groups (*Mid-Sized Group Dummy*) were dummy-coded 1 for those with 8–17 affiliates, 0 otherwise. Finally, large-size groups were dummy-coded 1 for those with more than 17 affiliates, 0 otherwise. Since classification of such group sizes based on the number of affiliates is arbitrary (a simple measure), Khanna and Palepu (2000) did a robustness test for these measures with commonly used alternatives (total group sales and assets) while investigating the effect of group size on performance. They found no qualitative difference due to classification based on number of affiliates, group sales, or group assets. Additionally, they found that both group sales and group assets are highly correlated with number of affiliate companies (pp 875, 878).

Given the data structure, we employ multiple regression analysis to test the relationship between the various independent variables and internationalization. As proposed in the hypotheses, a firm's decision to operate internationally is affected by its underlying characteristics, and we estimate our regression using lagged-structure models by regressing internationalization in year $t+1$ on company attributes in year t to correct for potential endogeneity.[4] The use of lagged-structure models is

appropriate because it is reasonable to expect a time lag between a firm's effort to operate abroad and its outcome in the international market in the subsequent year. The complete empirical model for testing Hypotheses 1–5 can be written in the following form:

$$Internationalization_{(t+1)} = \alpha(Constant) + \beta_1(Age)_{(t)}$$
$$+ \beta_2(Product\ Diversification)_{(t)}$$
$$+ \beta_3(Marketing\ Intensity)_{(t)} + \beta_4(Research\ Intensity)_{(t)}$$
$$+ \beta_5(Market\ Power)_{(t)} + \beta_6(Operational\ Efficiency)_{(t)}$$
$$+ \beta_7(Network\ Internationalization)_{(t)}$$
$$+ \beta_8(Network\ Scope)_{(t)}$$
$$+ \beta_9(Foreign\ Partner\ Ownership)_{(t)}$$
$$+ \beta_{10}(Dummy\ Variables) + \varepsilon(Error)$$

The data analysis was conducted on manufacturing companies listed in the PROWESS database compiled by the Center for the Monitoring of the Indian Economy (CMIE). This database covers the majority of public Indian companies, and is compiled using audited annual reports provided by the companies. This database has been used by several previous studies on Indian firms (e.g., Khanna and Palepu, 2000; Khanna and Rivkin, 2001; Chacar and Vissa, 2005), and the relative quality and accuracy of this source are rated positively, encouraging us to use it for our sample. We supplemented information from the database when necessary by referring to annual company reports. We also randomly cross-checked the data with other sources of information and found them to be consistent with one another. Within the database, we restricted our focus primarily to manufacturing firms with sales of at least 50 million Indian rupees (roughly 1.08 million US dollars). We chose this cut-off, as firms below this threshold represent small firms, are unlikely to be involved in foreign markets directly, and are likely to be served by international markets through intermediary firms. We chose to focus on manufacturing firms, as manufacturing represents the core of the value-added in the Indian economy, despite the recent rise of the Indian software industry. This phenomenon of manufacturing representing the significant portion of economic value-added is common to most emerging markets, unlike developed markets, where services represent the majority of the economy. After elimination of firms with missing values, the final sample was made up of 794 firms from the time period 2000–2003.

Descriptive statistics of the variables along with correlation values are presented in Table 1. A review of the correlation tables indicates that the correlation between independent variables could pose a problem. Network internationalization and network scope had a relatively higher correlation of 0.702 ($P<0.01$), and was a cause for concern in the regression models. This value was marginally higher than the threshold of 0.7 that is used as a rule of thumb for collinear relationships, below which should not create potential problems (or statistical confounds) related to multicollinearity (Griffiths et al., 1993; Anderson et al., 1996). Therefore, in the testing of the models, we used two checks (elaborated in the results section) to ensure that multicollinearity issues do not bias the results of the regression models used in this study. Our second test was to plot the data and also check for heteroskedasticity in the data using Levene's test. Results indicated that heteroskedasticity is not a problem with the data. Additionally, since this study uses lagged cross-sectional models for testing the hypothesis, we also checked for Durbin–Watson statistic values in each of our regression models to ensure that OLS assumptions of independence are not violated.

Study findings

Regression models were used to test the hypotheses, and the results of these models are presented in Table 2. In the control model, Age, as expected, was negatively related to internationalization ($\beta=-0.111$, $P<0.01$). Consistent with previous research, we anticipated that older firms would be less likely to seek international markets, as this would require adaptations and modifications to the established routines and practices currently within the firm. Firm-level product diversification is not related to internationalization in each of the models tested, in contrast to earlier research (e.g., Hitt et al., 1997) that focused on relatively larger firms, namely, US MNCs. In the control model, both group dummies were insignificant. Models 1 to 3 test for the influence of firm characteristics, namely, differentiation and cost-based advantages.

As suggested in Hypothesis 1, the results of Model 1 indicate that marketing intensity and research intensity are insignificant. These two variables have been of interest to traditional international business theorists, as one of the key arguments for international operations has been to exploit its intangible resources (e.g., Hymer, 1960; Caves, 1982). In Model 2, market power was statistically supported ($\beta=0.133$, $P<0.01$), and in Model 3 operational efficiency was statistically supported ($\beta=0.058$, $P<0.1$), indicating the importance of cost-based advantages in explaining internationalization.

Results of Model 4 support the notion that network internationalization is positively related to firm-level internationalization ($\beta=0.215$, $P<0.01$), as suggested in Hypothesis 3. Hypothesis 4 suggested a positive relationship between network scope and firm internationalization, which is tested in Model 5. One of the surprises of this study was that network scope was negatively related to firm internationalization ($\beta=-0.300$, $P<0.01$), quite opposite to Hypothesis 4. As mentioned earlier, we were concerned at the high correlation between network scope and network internationalization. We wanted to be sure that multicollinearity did not invalidate the study results, and therefore undertook two steps to ensure this high correlation was not the reason for this particular finding. First, we dropped network internationalization and ran an additional Model (5a), wherein

Table 1 Means, standard deviations and correlations ($n=794$)

Variables	Mean	Std dev.	1	2	3	4	5	6	7	8	9	10
1. Firm internationalization	0.10	0.22	1									
2. Age	29.10	20.30	−0.148**	1								
3. Product diversification	0.05	0.15	0.025	0.088*	1							
4. Marketing intensity	0.02	0.04	−0.031	0.008	−0.051	1						
5. Research intensity	⩾0.00	0.01	0.010	−0.023	0.069	0.052	1					
6. Market power	0.59	0.79	0.089*	0.013	−0.028	0.114**	−0.010	1				
7. Operational efficiency	1.22	0.31	0.098**	−0.119**	0.042	−0.040	0.020	0.064	1			
8. Network internationalization	0.56	1.03	0.158**	−0.045	−0.023	−0.090*	0.005	0.036	0.050	1		
9. Network scope	1.95	1.16	−0.059	0.036	0.017	−0.071*	−0.014	0.017	0.049	0.702**	1	
10. Foreign partner ownership	1.13	6.93	0.072*	−0.015	0.003	0.001	−0.010	0.274**	0.002	−0.036	−0.052	1

*Correlation is significant at the 0.05 level two-tailed.
**Correlation is significant at the 0.01 level two-tailed.

Table 2 Regression results between firm and group characteristics with internationalization ($n=794$)

	Control model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 5a	Model 6
Independent variables								
Age	−0.111***	−0.110***	−0.108***	−0.101***	−0.095***	−0.078**	−0.096***	−0.079**
Product diversification	0.043	0.043	0.046	0.043	0.042	0.052	0.048	0.052
Small group dummy	−0.024	−0.025	−0.017	−0.012	0.155***	0.036	−0.109	0.042
Mid-sized group dummy	−0.026	−0.026	−0.015	−0.022	0.096**	0.018	−0.088	0.022
Marketing intensity		−0.017	−0.030	−0.028	−0.002	−0.014	−0.041	−0.011
Research intensity		−0.017	−0.019	−0.018	−0.015	−0.019	−0.021	−0.018
Market power			0.133***	0.127***	0.116***	0.110***	0.128***	0.092***
Operational efficiency				0.058*	0.058*	0.063*	0.060*	0.064**
Network internationalization					0.215***	0.366***		0.369***
Network scope						−0.300***	−0.123***	−0.296***
Foreign partner ownership								0.061*
Adjusted R^2	0.037	0.037	0.051	0.053	0.078	0.116	0.060	0.119
F value	4.985***	4.029***	4.4847***	4.669***	6.126***	8.467***	4.916***	8.128***
Incremental R^2		0.000		0.016				0.066
Incremental F value		N.A.		1.645*				5.272***

***$P<0.01$, **$P<0.05$, *$P<0.1$. All variables were mean-centered in the regression models to remove non-essential multi-collinearity. All models were run with four sector dummies. All beta values reflected standardized beta values.

we checked to see whether there were any changes in the pattern of results. As seen in Table 2, the result pattern remained the same. Additionally, we checked for variance inflation factor (VIF). The recommendation is that, as long as VIF is less than 10, multicollinearity is not a concern (Burns and Bush, 2000). The VIF number varied from 1.046 to 3.660 (for Model 5), well below the threshold of 10 suggested by scholars. Model 6 tested for the influence of share of the foreign partner, wherein support was found for Hypothesis 5 ($\beta=0.061$, $P<0.1$).

Intrigued by the lack of support for Hypothesis 4 (i.e., statistically significant findings opposite to Hypothesis 4), we also conducted supplemental analysis, and report the results in Table 3. Our suspicion (*post hoc*) was based on the review of Models 1–4. The two dummy variables for group size have statistically insignificant loadings in Models 1 to 3 but statistically significant positive loading in Model 4. This led us to infer that size of group could be a potential reason for the lack of support for Hypothesis 4. Therefore we ran an additional model (Model 7), in which we attempted to test whether the influence of network scope was consistent across all the three sizes of the group. We created interaction terms using the two group size dummies and scope (i.e., *Network Scope × Small Group Dummy*; *Network Scope × Mid-Sized Group Dummy*). In Model 7, based on positive loading of interaction terms ($\beta=0.236$ and 0.303, $P<0.01$), we

found partial support for Hypothesis 4, wherein findings indicate that network scope does have a positive effect for mid-sized and smaller-sized groups and a negative effect for large groups. Interestingly, relative to Model 6, the variable share of foreign partner ownership had a decrease in beta value, indicating that the variables are not independent. To pursue this issue further, we introduced an interaction term (*Foreign Partner Ownership × Market Power*) to determine the interactive effect of a foreign partner on firms with market power, and ran two separate models (Model 8 and Model 9). In both of these models, loading of foreign partner ownership increased to 0.136 and 0.126 respectively ($P<0.01$), while the interaction term had negative loadings ($\beta=-0.107$, $P<0.05$ and $\beta=0.099$, $P<0.1$), demonstrating the importance of foreign partners to firms lacking market power.

We also tested for the incremental contribution of each set of variables (i.e., differentiation, cost and network) within the models tested. As shown in Table 2, Model 1 (which included research and marketing intensity) did not explain any additional variance over the control model. Next, we compared Model 3, which includes the cost advantage variables, with Model 1. While there was an increase in the variance explained (incremental $R^2=0.016$), the incremental F value was significant only at the $P<0.1$ level. Finally, we compared Model 6 with Model 3 to separate the contribution

Table 3 Supplemental regression results between firm and group characteristics with internationalization ($n=794$)

	Model 7	Model 8	Model 9
Independent variables			
Age	−0.081**	−0.077**	−0.080**
Product diversification	0.042	0.050	0.041
Small group dummy	−0.305***	0.047	−0.289***
Mid-sized group dummy	−0.268**	0.025	−0.263***
Marketing intensity	−0.024	−0.012	−0.024
Research intensity	−0.017	−0.017	−0.017
Market power	0.103***	0.114***	0.122***
Operational efficiency	0.061*	0.063*	0.059*
Network internationalization	0.491***	0.372***	0.490***
Network scope	−0.562***	−0.296***	−0.556***
Foreign partner ownership	0.057*	0.136***	0.126***
Network scope × small group dummy	0.236***		0.236***
Network scope × mid-sized group dummy	0.303***		0.294***
Foreign partner ownership × market power		−0.107**	−0.099*
Adjusted R^2	0.130	0.122	0.133
F value	7.986***	7.899***	7.757***

***$P<0.01$, **$P<0.05$, *$P<0.1$. All variables were mean-centered in the regression models to remove non-essential multi-collinearity. All models were run with four sector dummies. All beta values reflected standardized beta values.

of the three network variables studied. Findings indicate that network variables explain about 6.6% of the variance in the regression models (incremental R^2 and F values of 0.066, 5.272, $P<0.01$), validating previous research on the role of network resources in facilitating internationalization (Benito and Welch, 1994; Coviello and Munro, 1997).

This study, as with most research studies, is characterized by the inherent limitations of the research process. There are three primary constraints: (1) Despite the fact that this study's research design uses lagged-cross-sectional models, one cannot claim that longitudinal or temporal changes taking place in the in Indian market are fully incorporated. (2) Exclusive focus on Indian firms limits its generalizability to firms in other emerging markets. (3) This study's emphasis on publicly available secondary data does not allow for incorporation of many other possible dimensions of internationalization (e.g., type of markets) in the data analysis.

Recognizing these limitations will enable readers to delineate boundary conditions within which these results pertain. The following section of the paper discusses this study's research and managerial

implications, and concludes with suggestions for future research.

Discussion

The goal of this study was to explain how firms from an emerging market context build capabilities for international operations. Conceptual arguments were made for the importance of cumulative capabilities in international operations (Johanson and Vahlne, 1977) and networks (Johanson and Mattsson, 1988). While support was found for both assertions, we suggest these additional dimensions be incorporated in the context of emerging markets. For instance, the Uppsala model emphasizes learning by firms in international markets; our findings suggest that learning within the network (from other network members in the home country) is a viable option to build capabilities for international operations. Apart from knowledge, emerging market firms belonging to the networks can access scarce resources (e.g., financial capital, human capital, reputation) from business group members (Khanna and Rivkin, 2001). Therefore certain assumptions and notions of the Uppsala model (i.e., deterministic sequential stages, commitment, state/change variables) need to be extended to incorporate the confluences of these linkages within a firm's network.

While the efficacy of networks in the process of generating international sales has been documented in the literature by several earlier fine-grained studies (e.g., Welch *et al.*, 1998), this study uses lagged-cross-sectional secondary data models to document this phenomenon. Significantly, the importance of networks is evident, considering the fact that firms in the emerging market context lack the traditional monopolistic resources deemed necessary for operations abroad, as asserted in literature on the MNC (Hymer, 1960). In instances where firms lack parental networks, or when parental networks themselves do not have the requisite international resources, the notion of bridging ties was suggested, wherein a foreign firm is used to tap sources of information and opportunities in international markets.

Results of the study indicate that, while emerging market firms operating in international markets lack the differentiation (marketing-based and technology-based) advantages, these firms possess cost (size-based or efficiency-based) advantages. Applied in a broader context, the results of the study reinforce the importance for a firm to choose a cost-based or differentiation-based approach to

competitive advantage, depending on the environmental context. Consistent with the traditional concept of strategy-environmental fit, cost-based rather than differentiation-based strategies were suggested for internationalization. While these requirements for fit may change as emerging markets evolve, findings indicate that such a choice is valid for firms pursuing internationalization in the current Indian environmental context.

This study's findings offer several implications for managers from emerging markets seeking to increase their firm's exposure internationally. First, they indicate that the firms studied lack R&D and marketing resources, which is contrary to the traditional arguments and empirical support received by these variables in the extant literature on internationalization. Therefore, despite the lack of these resources, emerging market firms seeking international markets need to resort to strategies that build international capabilities sequentially (Chang, 1995). In this approach, emerging market firms may first want to enter international markets wherein they will not be handicapped by the lack of such resources. One option could be that emerging market MNCs may first want to target large emerging markets (e.g., BRIC countries) where existing resources will allow successful entry. Once such operations are established, emerging markets can provide opportunities for growth and international learning as much as developed markets, albeit in the lower (i.e., price-sensitive) segments. Firms can later use these opportunities to leverage and build firm resources and capabilities to enter developed markets.

Second, this study calls for firms developing international operations to integrate their own, as well as network, resources into strategic planning (Zaheer and Bell, 2005). Firms belonging to business groups should take note of the importance of group-level exposure to international markets. They should capitalize on their resource base of international knowledge, skills, and experience by making institutional efforts to learn and internalize the experience of other group members in international markets (Welch and Welch, 1996). This will not only increase the potential of the firm gaining rapid exposure to international markets, but also reduce the chances of making mistakes due to liabilities of foreignness (Luo and Peng, 1999; Luo, 2003).

Third, for firms lacking parental support, an option could be to seek foreign partners with such resources. These partners allow local firms to tap into newer markets and potential networks belonging to the partners in other markets. The beneficial role of foreign partners for internationalization seems to be higher for local firms who are smaller players in their industry. Finally, managers of larger groups need to recognize that they are unable to benefit from network scope to increase international exposure as effectively as much smaller groups. Therefore we call for firms that are members of large groups with network scope to find ways to organizationally adapt (restructure) in order to benefit and capitalize on their size and scope to increase their international market exposure.

In closing, we suggest several related avenues that will further our understanding of this topic. First, while it is evident that group level internationalization facilitates firm-level internationalization, it is not evident how this knowledge and capabilities are transferred from one member to the focus firm. Therefore, future researchers may want to look into how firms within a network transfer learning (i.e., internationalization knowledge: Eriksson et al., 1997) to other members. While earlier work by Chang (1995) and Guillen (2003) offers valuable insights into the foreign investment process of Japanese and Korean firms, it is still not evident what formal or informal mechanisms are used for transfer of learning. Second, while this study's focus is on aggregate internationalization of the firm, it would also be interesting to see whether there are patterns in choice of specific overseas customers and markets. For instance, once a group has established operations in a country, how do firms in that group capitalize on foreign business knowledge and institutional knowledge? Three approaches have been articulated in the literature by Johanson and Mattsson (1988): international extension (new relationships with the foreign network); penetration (strengthening of relationships with the foreign network); and international integration (increasing exchanges and coordination with the foreign network). Therefore the next step would be to test which of these approaches is more effective. Finally, the underlying bias of this study and most other studies on this topic has been the beneficial aspects of network resources for internationalization. Our review of the literature did not indicate any published work indicating potential negative effects of such an approach. For instance, it would be interesting to investigate whether there are any pitfalls to relying on parental resources for internationalization. We hope this study's findings as well as these unresolved issues will

serve as an important stimulus to further research on this topic.

Acknowledgements

Notes

[1]Eriksson *et al.* (1997) argue that knowledge consists of external and internal components. The external component is made of two sets of knowledge: 'foreign business knowledge' (knowledge of clients, markets and competitors); and 'institutional knowledge' (knowledge of foreign institutions, governments, rules, norms and values). They refer to the internal component as 'internationalization knowledge' (a firm's capability to engage in international operations). To help differentiate between the two types of knowledge, Hadley and Wilson (2003) refer to the former type of knowledge capture as the 'know-why' aspect and the latter as the 'know-how' aspect of knowledge.

[2]One suggestion posed by the Uppsala model is to acquire such knowledge from outsiders, i.e., through mergers and acquisitions or hiring of talent from the market (Johanson and Vahlne, 1977; Johanson and Mattsson, 1988; Barkema and Vermeulen, 1998). While this option is feasible to a certain extent in the case of business and institutional knowledge, internationalization knowledge based on institutional his-tory and memory stored in a firm's routines and structures is hard to decipher (Nonaka, 1991). Moreover, acquisitions in foreign markets are usually expensive and beyond the reach of most emerging market firms. Acquisitions are also characterized by many pitfalls wherein firms overpay for the acquired assets, face paralysis due to organizational cultural dissimilarities, acquire undesirable assets associated with the transaction, and fail to successfully integrate operations (Balakrishnan and Koza, 1993; Hennart and Reddy, 1997). Obviously, a less costly and risky approach for emerging market firms is the hiring of individuals with relevant expertise. While the acquisition of such talent lies within the realm of possibilities for emerging market firms, its efficacy is likely to be limited, as experience cannot be transmitted (Johanson and Vahlne, 1977). Additionally, firm knowledge and capabilities embedded in organizations cannot be replicated through the hiring of one or more individuals, as such knowledge is path-dependent, socially complex, and causally ambiguous (Barney, 1991; Nelson, 1991).

[3]This law states that 'The larger the variety of actions available to a system, the larger the variety of perturbations (input variations) it is able to handle' (Page 1: Adapted from Heylighen and Joslyn, 2001).

[4]Another potential solution for correcting endogeneity is to use a two-stage modeling methodology. However, that approach is not adopted here owing to a lack of supporting literature on variables identifying the internationalization equation in the structured model setting.

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