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Third-World Copycats to Emerging Multinationals: Institutional Changes and Organizational Transformation in the Indian Pharmaceutical Industry

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**‘THIRD-WORLD COPYCATS’ TO ‘EMERGING MULTINATIONALS’: INSTITUTIONAL  
CHANGES AND ORGANIZATIONAL TRANSFORMATION IN THE INDIAN  
PHARMACEUTICAL INDUSTRY**

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**‘THIRD-WORLD COPYCATS’ TO ‘EMERGING MULTINATIONALS’: INSTITUTIONAL CHANGES AND ORGANIZATIONAL TRANSFORMATION IN THE INDIAN PHARMACEUTICAL INDUSTRY**

**ABSTRACT**

This article investigates how Indian pharmaceutical firms, facing discontinuous institutional changes in their domestic environment due to economic liberalization and intellectual property reforms, have undertaken organizational transformation. Internationalization of resources and product markets constitutes an important component of organizational transformation for local firms in emerging economies. Using longitudinal data on 206 Indian pharmaceutical firms from 1995–2004, we find that firms’ access to international technological and financial resources enables product market internationalization. Furthermore, we theorize and find support for our predictions that the association between international resources and markets is conditioned by time and business group affiliation, and product market internationalization affects financial performance. Several implications thus emerge for theory and practice associated with the sources of competitiveness in emerging economy firms and their transformation into globally competitive multinational firms.

*Keywords:* emerging multinationals; economic liberalization; business groups; resource internationalization; emerging economies; pharmaceutical industry; globalization

Significant attention recently has focused on emerging multinationals or rapidly globalizing firms from emerging economies (e.g., Aulakh 2007, Engardio 2006, Khanna and Palepu 2002, OECD 2006). These firms seem poised to transform industries and markets around the world and thus constitute a disruptive threat to traditional multinationals (*The Economist* 2007b). Many newly globalizing firms appear to be modern-day reincarnations of the erstwhile stodgy and archaic domestic firms that transformed themselves in response to the exogenous shocks of regulatory and institutional reforms. Although the emergence of these new international powerhouses calls for scrutiny, surprisingly little research considers how these resource-poor, technologically deficient firms from one-time developing economies have transformed themselves to compete with multinationals from developed country markets (Hitt, Li, and Worthington 2005).

Considering the fledgling nature of inquiry in this area, our study examines the internationalization of Indian pharmaceutical firms in the wake of market liberalization (1991) and intellectual property reforms (1995), which represents an especially appropriate setting for several reasons. First, we can identify clear watershed events, or exogenous shocks, in the form of comprehensive institutional reforms that changed the formal and informal rules of the game and affected the organizations as the players in that game (Peng 2003). The reforms fundamentally changed the competitive landscape in the industry, especially for domestic firms, requiring them to not only reconfigure their resources and capabilities but also acquire new capabilities to survive. Second, the pharmaceutical sector has emerged, along with information technology, as one of the two industries spearheading India's growth in global trade (KPMG 2006). Together, the combination of a readily identifiable trigger event and the subsequent resurgence provide a unique setting in which to study the morphing of "third-world copycats" into emerging multinationals.

The core thesis in this paper is that in a post-liberalization scenario, Indian pharmaceutical firms required access to world-class technological and financial resources to leverage their existing process and manufacturing capabilities into global markets. To the extent they were able to access such resources and know-how, they became successful in international markets. Linking the transition from local to global

resource and product markets to performance, we posit that internationalization is fundamental to the strategic transformation of emerging economy firms in response to institutional changes. We consider two key boundary conditions in the relationship between the internationalization of resources and product markets. First, in light of research that indicates the value of resources and capabilities is subject to the stage in the life cycle and evolutionary pressures (Helfat and Peteraf 2003), we propose that the relative importance of these different types of resources on product market internationalization changes over time as the impact of liberalization gathers momentum. Second, we consider the impact of a unique institutional aspect of emerging economies, namely, business groups, on strategic responses to institutional change (Hoskisson, Canella, Tihanyi, and Faraci 2004, Newman 2000) to determine how such affiliation conditions product market internationalization. We provide our conceptual model in Figure 1. We test these relationships using ten-year panel data from 206 indigenous firms within the Indian pharmaceutical industry during the period 1995–2004.

Our study contributes to existing research on the ability of organizations to respond to exogenous sources of disruption and its affects on their performance (Henderson and Clark 1990). Focusing on the imperative of reconfiguring resources, product markets, and capabilities in response to external shifts (Helfat and Peteraf 2003, Teece, Pisano, and Shuen 1997), the evolutionary view in strategy research emphasizes deliberate search processes in organizational morphing (Barnett and Burgelman 1996, Helfat and Lieberman 2002, Zollo and Winter 2002). While the dominant context of such research has been the effect of technological shifts on incumbent firms (e.g., Abernathy and Utterback 1978, Tushman and Anderson 1986), there is a relative paucity of research on how organizations transform themselves in the face of institutional transitions, even though regulatory reforms in emerging countries continue to cause far-reaching changes in the global playing field in many industries (Filatotchev, Wright, Uhlenbruck, Tihanyi, and Hoskisson 2003, Newman 2000, Ray 2003). The limited literature on firm-level impacts of institutional changes in emerging economies highlights factors that inhibit strategic transformation, such as pace of institutional changes (Newman 2000), governance mechanisms (Filatotchev et al. 2003), embeddedness and organizational structures (Peng and Heath 1996), and the slow development of

institutions and factor markets (Spicer, McDermott, and Kogut 2000). In their review of this literature stream however, Uhlenbruck, Meyer, and Hitt (2003) stress the need to identify factors that foster strategic transformation. In line with this view, we identify and focus on the internationalization of resources and product markets as one such driver of organizational transformation in the context of Indian pharmaceutical firms as they respond to institutional changes in their domestic environment.

Building on the idea that organizational activities, which require linking technological know-how, product development, and customer requirements, can serve as sources of dynamic capabilities and enable firms to generate new competencies (Danneels 2002), it seems plausible that a strategic emphasis on internationalization would drive transformation. Literature suggests that international markets serve as not only learning laboratories (Hitt, Hoskisson, and Kim 1997, Hitt et al. 2005) but also as modes through which firms gain access to diverse, locally embedded ideas and knowledge from across the world (Doz, Santos, and Williamson 2001). Firms' ability to compete in global markets may accrue endogenously through experiential learning in international markets (Hitt et al. 1997, Zollo and Winter 2002). However, emerging economy firms face a unique problem in that they are plagued by significant knowledge and resource disadvantages in developing the front-line capabilities required to compete in demanding foreign markets. Therefore, the generation of capabilities may follow an iterative process of exploration or learning activities that lead to the addition of new resources, and then their subsequent exploitation by using these resources in new product markets (Danneels 2002, March 1991). This fundamental relationship between exploration of new resources and exploitation in new product-markets, which Wernerfelt (1984, p. 171) terms "two sides of the same coin," deserves further attention in the context of organizational transformations in emerging economies in response to institutional changes.

In the following sections, we first review the evolution of the Indian pharmaceutical industry in light of institutional changes. Next, we develop specific hypotheses emanating from the conceptual model. We then describe the methodology and report the empirical findings. In the final section, we discuss the contributions of our findings to research on organizational transformation in response to institutional changes, as well as to nascent literature on emerging economy multinationals.

[INSERT FIGURE 1 HERE]

## **INSTITUTIONAL CHANGES AND THE EVOLUTION OF THE INDIAN PHARMACEUTICAL INDUSTRY**

The Indian pharmaceutical industry is sizeable; globally, it ranks fourth in volume and thirteenth in value (CRIS INFAC 2004). In 1970, to strengthen the domestic pharmaceutical industry, the Indian government introduced the Indian Patents Act, which allowed patenting based on manufacturing processes instead of granting patents to end-products, as occurs in developed countries. This regulation enabled Indian pharmaceutical firms to reverse engineer and produce drugs that were product-patented in other countries and thus capture the dominant share of the domestic market from multinationals.

Since the early 1990s, the Indian pharmaceutical industry has faced two institutional changes that severely affected the dynamics of the industry. First, in line with a series of major, economy-wide liberalization measures initiated by the Indian government since 1991, the pharmaceutical industry underwent significant delicensing and liberalization of imports and foreign investments. Second, as a member of the General Agreement on Tariffs and Trade (now the World Trade Organization [WTO]), India in 1995 agreed to change its patent regime to introduce product patents and provide legal protection to Trade Related Intellectual Property Rights by 2005, after a permissible transition period of 10 years. Reverting to the product patent regime would provide the protection sought by international pharmaceutical firms when bringing their latest and best products to India and likely result in a steep increase in competition. It also marked a dramatic change for Indian pharmaceutical firms, which traditionally had thrived by manufacturing and selling knockoffs of patented drugs in India and exploiting the prevailing process patent regime. *The Wall Street Journal* hailed the implementation of the new patent regime in India as “finally putting a stop to decades of simply copying someone else’s pharmaceutical breakthrough” (March 25, 2005).

In light of these institutional changes, the prognosis for local firms in the Indian pharmaceutical industry in 1995 was grim. However, in sharp contrast to these dire predictions, the last decade has seen an industry-wide resurgence and the emergence of the pharmaceutical industry as one of the key drivers

of India's global competitiveness and export-led growth (FICCI 2005). Since the inception of economic liberalization measures in 1991, the size of the Indian pharmaceutical industry has grown at a compounded growth rate of 15.9% (CRIS INFAC 2004). Indigenous Indian firms strengthened their relative position in relation to foreign multinationals and increased their domestic market share from about 60% to close to 77% since the reform process began. Nine of the top ten companies in the Indian pharmaceutical industry in 2005 were domestically-owned, compared with just four in 1994 (KPMG 2006).

The most vivid indicator of the organizational transformation in the Indian pharmaceutical industry is the steep growth in the degree of internationalization in the revenues of an average firm. The total exports of pharmaceuticals from India (primarily undertaken by indigenous Indian firms rather than subsidiaries of multinationals) have increased from \$503.1 million in 1995 to more than \$3.13 billion in 2004 (FICCI 2005), for a compounded 22% annual growth rate. More important, in the context of the sample of 206 firms for this study, the average percentage of export sales to total sales increased from 15% in 1995 to 27% in 2004. A striking feature of internationalization of the Indian pharmaceutical industry is its breadth—a sizeable number of firms, instead of just a few large ones, are international—which indicates international expansion as an industry-wide phenomenon. Of the 206 firms in our sample, 92 (nearly 50%) earned more than 50% of their sales from foreign markets in the year 2005. Another feature of their internationalization pertains to target geographies. Exports of Indian pharmaceutical firms traditionally were to other emerging economies (CRIS INFAC 2004). However, in the last decade, Indian firms have increasingly targeted the advanced markets of North America and Western Europe by meeting the stringent standards of regulatory agencies such as the U.S. Food and Drug Administration (FDA).<sup>1</sup> As of 2002–03, North America (19%), Western Europe (20%), and East Asia (20%) together constituted almost 60% of Indian pharmaceutical exports (Shah 2004).

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<sup>1</sup> In recent years, the Indian pharmaceutical industry has also attempted to build capabilities to compete in more value-added and profitable segments in the global marketplace, as evidenced by the acceleration in the regulatory filings in the U.S. and European markets for generic drugs. The Drug Master Filings (DMFs) in the United States have increased from 20 in 1995 to more than 140 in 2004. The proportion of DMF filings with the U.S. FDA from India was close to 40% in 2005 compared with about 3% in 1995 and 13% in 2000 (IBEF 2006). Furthermore, Indian companies filed an estimated 150 Abbreviated New Drug Applications (ANDAs) with the U.S. FDA in 2004, accounting for more than 25% of ANDA filings, compared with around 10 filings in 2000 (IBEF 2006).

The aggregate industry-level data indicate organizational transformation in the Indian pharmaceutical industry in the face of the dual institutional pressures of liberalization of the Indian economy and new intellectual property protection regimes. There has been a shift in terms of moving from a primarily domestic focus to substantial sales coming from a diversity of international markets. This shift begs the question: What were the drivers of organizational transformation for these firms, given the severe increase in competition and the loss of their core advantage? We turn to an examination of firm-level heterogeneity within the industry to understand the drivers of organizational transformation.

### **THEORY AND HYPOTHESES**

At a broad level, we focus on the manner in which the mandate of institutional changes, that emanate from increasing global integration of emerging economies, radically changes the competitive scenario for indigenous firms and enforces a survival imperative of strategic transformation. Conventional thinking indicates that local firms from emerging economies respond to regulatory reforms and foreign competition by developing strategies that exploit their home country–nurtured, unique resources and capabilities. Accordingly, firms reportedly call on the government for support, sell out to foreign multinationals, or leverage cost-oriented, commodity approaches, such as component or private-label manufacturing, for established multinationals (Craig and Douglas 1997, Dawar and Frost 1999). Khanna and Palepu (2006) also suggest that emerging economy firms, which are especially capable of serving markets with underdeveloped infrastructures and institutional voids, tend to move into other emerging markets that have similar institutional environments. Although these suggestions conform to the dominant idea that firm internationalization exploits existing advantages abroad (Dunning 1988), an intriguing question arises when we consider the genesis of learning and strategic transformation that enable these firms to compete on the multinationals’ turf in developed markets with advanced value-added products and services (Hitt et al. 2005, Mathews 2006).

We build our thesis on the basis of recent insights that local firms from emerging economies may differ from Western firms in how they embark on their internationalization process (Mathews 2006). One fundamental assumption typical of Western models of international expansion is that the firm in question

already possesses the technology and product-related knowledge it needs to cater to the demands of the foreign markets, and the act of internationalization serves to exploit this stock of existing know-how (Hitt, Tihanyi, Miller, and Connelly 2006). However, an alternative model suggests that even prior to moving into international markets, a firm must upgrade its technological and scientific know-how to be able to offer products commensurate with the more advanced needs of international markets. Due to underdeveloped strategic factor markets for finance and technology, emerging market firms often face difficulties in acquiring resources (Hitt et al. 2005). Overcoming this initial resource hurdle to become globally competitive is critical for the transformation process to start. Only after local firms gain access to these resources can they engage in the endogenous process of learning new capabilities by entering and operating in foreign product markets (Luo and Tung 2007, Mathews 2006). For emerging market firms, internationalization therefore is a mode to access new resources (Dunning 2006, Korhonen, Luostarinen, and Welch 1996), with capability development and competitive advantage following, rather than leading, their internationalization (Dunning 2006).

### **Technological and Financial Resources**

In developing our model, we consider two key factors in technology-intensive industries, namely, access to technological know-how and capital markets. Technology and capital form two critical gaps between firms from emerging markets and those from more developed markets (Khanna and Palepu 2000a). The quality of technology accessed from domestic sources is often inadequate for success in international markets, which necessitates import (Hoskisson, Eden, Lau, and Wright 2000). Technology imports include tangible resources, such as capital equipment and raw materials, and/or intangible resources, such as know-how and licensing in patented knowledge. Technological developments in emerging economies often consist of imports of foreign technology and its subsequent assimilation and adaptation to develop new innovations (Pradhan 2003, Young, Huang, and McDermott 1996). Furthermore, technology imports facilitate continuous interactions with foreign suppliers, which over time help develop knowledge about foreign markets and a network of valuable contacts, which themselves may lead to an overseas sales effort (Korhonen et al. 1996). UNCTAD (2000) identifies

backward linkages with suppliers as those with the deepest positive impact on international firms compared with linkages with customers or technology partners. This impact, termed “reverse transfer,” often appears in the form of exchanges of information, technical knowledge, and skills.

Similarly, commercial expansion into foreign product markets depends on the availability of financial resources. Financial capital forms a basic need for survival and competition in international markets (Hitt, Dacin, Levitas, Arregle, and Borza 2000). Capital enables investments in developing new products, as well as establishing a presence and distributing and selling in multiple geographies. However, financial markets in emerging economies are characterized by inadequate disclosures and weak controls (Khanna and Palepu 2000a). Given their underdeveloped financial markets, financial capital in emerging economies is generally scarce and costly (Hitt et al. 2000). Access to overseas capital, through listing firms in international stock exchanges, issues of American Depository Receipts (ADRs) or Global Depository Receipts (GDRs) and raising foreign currency debt can therefore provide a second critical international input to facilitate product market internationalization. In addition to facilitating the development of the infrastructure necessary for commercialization, raising overseas capital has other indirect benefits, such as a reputation effect, signaling quality to customers, and corporate governance benefits, which then have a positive impact on product market internationalization. These help overcome the liability of foreignness for newly internationalizing firms from emerging economies, which is likely to be steeper during initial forays into foreign markets because of negative country-of-origin effects (Aulakh, Kotabe, and Teegeen 2000, Mezias 2002). Firms might overcome these liabilities through alliances with more established multinationals or by listing in foreign stock markets, which helps firms establish credibility in the eyes of various stakeholders because it signals parity with other firms in the host market (Khanna and Palepu 2004). Thus, in our context, two critical enablers of the internationalization of product markets appear to be access to international technology and capital markets. Accordingly, we propose:

*H1: Accessing international technology resources relates positively to product market internationalization of Indian pharmaceutical firms.*

*H2: Accessing international financial resources relates positively to product market internationalization of Indian pharmaceutical firms.*

### **Time-Conditioning Effects**

Organizational resources and capabilities tend to be dynamic (Helfat and Peteraf 2003). As a firm attains critical levels of a given resource, its marginal returns may decline, which creates a need to access different resources to build complimentary capabilities (Ethiraj, Kale, Krishnan, and Singh 2005). On the basis of this conclusion, we argue that the relative impact of international resource inputs on product market internationalization should be dynamic and evolve over time. We first examine the changing impact of international technology resources on internationalization. In knowledge-intensive industries, a fundamental firm resource is its technological base (Helfat and Raubitschek 2000). Although the initial and key resource hurdle for emerging economy firms is technological, this resource also enables them to “catch up” faster by assimilating and enhancing imported technologies (Young et al. 1996). Over time, both through the absorption of technology resources and experiential learning about inputs and markets, firms develop internal resources and capabilities to sustain the internationalization process.

Drastic changes in the domestic environmental context caused Indian pharmaceutical firms to lose their dual advantages: protection in the domestic market and the core advantage of reverse engineering. Although these firms had access to a pool of scientific talent, jump-starting their transformation to product market internationalization required different types of technological resources. In particular, moving into international markets, especially developed countries, involved competing against well-entrenched multinational competitors, which necessitated more advanced manufacturing technology and value-added products. As their traditional source of competitive advantage in domestic markets lay in reverse engineering through innovative processes, internationalization required augmenting domestic cost advantages with quality improvements and value-added products. Inputs of international technology from foreign sources compensate for a lack of experience and focus on value-added proprietary products (Kumar and Aggarwal 2005) in the initial phase of post-liberalization period. Over time, as the foreign technology resources are absorbed and competitive products are developed for global

markets, the focus is likely to shift to greater exploitation of knowledge, which will result in a higher need for other resources, such as financial capital.

Evidence in the international business literature indicates that as firms go through stages of internationalization, their level of involvement increases. For example, in the internationalization stages model, the first foray into international markets is usually through a low-involvement/low-cost approach that entails the use of indirect exports (i.e., through home country intermediaries) to tap international markets. Over time, firms move toward more direct exports, which require setting up dedicated distribution channels and even their own sales subsidiaries in foreign markets (Aulakh and Kotabe 1997, Johanson and Vahlne 1977). High-involvement modes of entry require greater investment in higher order capabilities and more complex forms of organizing, which in turn create a critical need for financial resources. Furthermore, sustained internationalization growth requires moving up the value chain and increasing the depth and breadth of foreign market penetration. This move in turn requires investment in the development of indigenous capabilities in manufacturing, marketing, and selling, in addition to R&D. Growing anecdotal evidence suggests increased foreign direct investment activity, including acquisitions, among Indian firms across industries as they transition from export-based to multinational strategies that involve the dispersion of value-chain activities in different countries (MAPE 2006, *The Economist* 2007a). Access to international finance at this stage facilitates investments for such a transition. On the basis of these arguments, we propose:

*H3a: The relative importance of international technology resources on product market internationalization of Indian pharmaceutical firms is greater in the earlier period of the post-liberalization era.*

*H3b: The relative importance of international financial resources on product market internationalization of Indian pharmaceutical firms is greater in the latter period of the post-liberalization era.*

### **Business Group Affiliation**

A rich body of work has established the significance of business groups in the socioeconomic landscape of emerging economies (Ghemawat and Khanna 1998, Keister 1998, Khanna and Palepu 1997). Ranging from Korean *chaebols* to Turkish *families* to Latin American and Spanish *grupos* to Indian

business *groups*, these groups have been defined as “a set of firms which, though legally independent, are bound together by a constellation of formal and informal ties and are accustomed to taking coordinated action” (Khanna and Rivkin 2001, p. 47). Whereas the focus of early research was to understand the rationale behind business groups and relate their underlying characteristics to different country contexts (e.g., Guillen 2000, Khanna and Palepu 2000a), recent studies appear motivated by an attempt to understand their strategic responses to institutional transformations, which may undermine the very reasons for the initial group formation (e.g., Hoskisson et al. 2004, Hoskisson, Johnson, Tihanyi, and White 2005, Yiu, Bruton, and Lu 2005). Extending this theme, we investigate how business group affiliation affects product market internationalization, both directly, and indirectly through a conditioning effect on the relationship of international technology and financial resources on product market internationalization.

Extant literature on business groups identifies various benefits (Elango and Pattnaik 2007, Khanna and Palepu 2000a, 2000b) and costs (Bertrand, Mehta, and Mullainathan, 2002, Chacar and Vissa, 2005), leading Khanna and Yafeh (2007, p. 331) to conclude that “there is no clear verdict on the extent to which groups are ‘paragons’ or ‘parasites’.” Business groups tend to be viewed as a strategic response to factor market imperfections in emerging economies (Khanna and Palepu 2000a, Khanna and Rivkin 2001). Due to information asymmetries, poor contract enforcement, and imperfect regulatory structures, institutional voids develop in product, labor, and capital markets. The absence of intermediary institutions increases transaction costs for acquiring inputs such as technology, finance, and managerial talent. In response, business groups emerge. Performing the role of missing institutional intermediaries, business groups generate their own internal markets for financial capital and managerial talent.

However, business groups also involve associated costs (Keister 1998, Khanna and Palepu 2000b). Controlling families have been known to interfere in both tactical and strategic decision making, and member firms tend to suffer from conflicts of interests between controlling (typically, family) and minority shareholders. Bertrand et al. (2002) find evidence that controlling shareholders of Indian business groups engage in *tunneling*, or moving profits from firms in which they have low cash flow

rights to those in which they have higher cash flow rights. Chacar and Vissa (2005) also show that poor performance persists longer among group-affiliated than among unaffiliated firms and therefore argue that business group managers “may be pursuing different goals than expected” (p. 943). Due to inequity and nepotism, inefficient compensation systems tend to develop across group companies, with detrimental effects on the market for talent. Coupled with the security that group affiliation offers, managers of group-affiliated firms typically have weaker incentives to run their firms efficiently (Khanna and Rivkin 2001). As the variety of the businesses within a group increases, the dominant logic of the traditional businesses may prove increasingly inadequate for the emerging initiatives (Prahalad and Bettis 1986), which prompts suboptimal decisions that reflect organizational inertia.

Recent research questions the relevance and the ability of business groups to respond to disruptive institutional changes that arise as a result of economic liberalization (Khanna and Yafeh 2007). As emerging economies continue to improve their economic institutions, the positive benefits associated with business groups, which acted as market-substitute mechanisms, are likely to diminish (Khanna and Palepu 2000b). Business group affiliations, considered a plus during periods of underdeveloped capital markets and protectionist regimes that hindered the inflow of technological know-how and other resources, may be harmful in a post-liberalization era. Local firms require second-order organizational changes in response to market reforms, which in turn requires a greater emphasis on both exploratory and exploitative learning (Newman 2000). Firms that are embedded in institutional frameworks, however, are less likely and slower to undertake transformations when faced with environmental changes than are firms that are less embedded (Greenwood and Hinings 1996, Hoskisson et al. 2004, Kriauciunas and Kale 2006, Newman 2000, Ray and Chakrabarty 2006). As they cope with institutional changes, the endowed resources from the pre-transition period may become burdens for business groups (Yiu et al. 2005).

On the basis of these arguments, we derive some implications for group-affiliated firms regarding the likely impact of institutional changes on their internationalization behavior. First, due to the buffering effect of business groups against disruptive changes, relatively easy access to political capital, and market power, business group-affiliated firms are less likely to feel the full impact of institutional changes

compared with independent, unaffiliated firms immediately after the regulatory reforms are initiated. Second, even if they perceive the threat of environmental change, their ability to respond may be hampered by institutional legacies and founding characteristics. Third, agency costs may mean that interference by the dominant power coalition within the group impedes entrepreneurial decision making, which acts as a strong impediment to entering new markets. As a result, organizational inertia may hinder the ability to respond strategically to disruptive institutional changes. As product market internationalization involves moving into new competitive domains in diverse institutional settings and market conditions, the preference for the status quo among group firm managers may translate into a lower willingness and ability to undertake internationalization strategies compared with independent, unaffiliated firms. In summary, the combination of factors causes business group–affiliated firms to be less motivated or able to respond to disruptive institutional changes through product market reconfiguration. Accordingly, we propose:

*H4: Indian pharmaceutical firms affiliated with business groups are less likely to pursue product market internationalization as a response to institutional changes than unaffiliated firms.*

Moreover, the relationship between resources and product market internationalization should be conditioned by the firm’s background. As we mentioned previously, business groups are characterized by internal markets for products, capital, and management talent and thus serve the role of strategic networks that provide member firms with access to information, knowledge, resources, markets, and technologies (Elango and Pattnaik 2007). Group-affiliated firms are in a position to leverage linkages with other group companies to attain technological partners, suppliers, and other intermediaries and access domestic technology inputs (Chang, Chung and Mahmood 2006). Thus, the value of accessing technology inputs internationally and its impact on achieving product market internationalization is likely to be higher for unaffiliated firms than for firms affiliated with business groups.

In emerging economies, the rights of minority shareholders and creditors are usually poorly protected, which creates higher costs of capital. Moreover, some forms of capital, such as venture capital, have been virtually nonexistent. By transferring capital within the group or leveraging its reputation and

underwriting capital issues, a group can overcome such problems. For example, internal capital markets apparently operated within *keiretsus* (Lincoln, Gerlach, and Ahmadjian 1996), which allowed business groups to act as de facto venture capitalists and allocate resources to provide the necessary innovation infrastructure for member firms (Mahmood and Mitchell 2004). Resources that are relatively scarcer in emerging economies, especially technological and financial resources, are thus more easily accessible to affiliated firms. For example, business groups reportedly direct funds from existing affiliates to new ventures (Khanna and Palepu 2000a), and even in post-reform contexts, business group-affiliated firms continue to receive preferential access to domestic capital compared with independent firms, largely because of their historical relations with banks and reputation effects (Lensink, Molen, and Gangopadhyay 2003). In contrast, independent firms lack access to such internal capital markets and are at a relative disadvantage in competing for scarce domestic resources. Hence, the need to access international capital markets is even more critical for unaffiliated firms that want to pursue growth strategies in new product markets.

When unaffiliated firms achieve access to technology and financial resources from international markets, they are likely to be more effective in exploiting those resources because of their inherent structural advantages over group firms, namely, their lower organizational inertia and faster responses to external changes. On the other hand, a relatively lower professional accountability to external institutions may encumber group-affiliated firms with higher profligacy and lower efficiency in leveraging new resources into product markets. Due to their inclination toward conservative strategies, group affiliates may also be more likely to utilize resources to strengthen their position in the domestic markets rather than to achieve internationalization. On the basis of these arguments, we propose:

*H5a: The impact of international technology resources on product market internationalization is stronger for unaffiliated firms than for business group-affiliated firms.*

*H5b: The impact of international financial resources on product market internationalization is stronger for unaffiliated firms than for business group-affiliated firms.*

## **Product Market Internationalization and Firm Performance**

In the preceding sections, we have discussed how international technology and financial resources, as well as business group affiliation, relate to product market internationalization. A critical question that remains pertains to the relationship between the strategic transformation of product markets and firm-level outcomes. Substantive literature examines the benefits and opportunities of internationalization of product markets (for a review, see Hitt et al. 2006). First, learning opportunities (Barkema and Vermeulen 1998) arise from exposure to diverse institutional contexts, competitive conditions, and customer behavior; these opportunities enable firms to experiment with new ways to compete in different environmental settings. Second, in addition to learning benefits, internationalization leads to exploitative benefits that link to economic performance; by moving into new markets, firms achieve economies of scale and scope (Lu and Beamish 2004). However, several studies also identify costs associated with international expansion that limit these economic advantages. Market entry involves learning costs about the macro- and micro-environmental factors in each market, as well as setup costs for research, production, and marketing activities (Barkema and Vermeulen 1998, Hitt et al. 1997, Lu and Beamish 2004). Furthermore, managing activities across diverse cultural, geographical, and institutional environments increases information processing demands on managers, as well as coordination costs (Hitt et al. 1997). Considering the need to balance the inherent advantages of international diversification with its associated costs, various studies report a curvilinear relationship between internationalization and economic performance for both developed economy multinationals (e.g., Hitt et al. 1997, Lu and Beamish 2004) and internationalizing firms from emerging economies (Aulakh et al. 2000). That is, internationalization first increases economic performance, but after a certain point, diseconomies emerge, whereby coordination costs overwhelm the benefits of further expansion. In view of this nonlinear relationship, we test the following hypothesis in our context:

*H6: The relationship between product market internationalization and economic performance by firms in the Indian pharmaceutical industry is an inverted U-shape; the slope is positive at low to moderate levels of internationalization and negative at high levels of internationalization.*

## METHODOLOGY

### Data

We use the *Prowess* database from the Centre for Monitoring Indian Economy (CMIE), which is being increasingly used by strategy researchers (e.g., Chacar and Vissa 2005, Khanna and Palepu 2000a, Khanna and Rivkin 2001) for large-sample studies in India. The CMIE *Prowess* database contains detailed financial data about more than 9,000 Indian firms, including all firms traded on India's major stock exchanges and several others, such as central public sector enterprises. The database covers most organized industrial activity in India, and the firms in *Prowess* account for 75% of all corporate taxes and more than 95% of the excise duties collected by India's government. The database contains 339 companies under the (four-digit) industry classification of drugs and pharmaceuticals, from which we sample a panel of 206 domestic firms as follows: We first eliminate subsidiaries of foreign firms (35), followed by firms that founded after 1995 (22), the year of the triggering event. Of the remaining 282 firms, we retain those firms that recorded minimum sales of Rs. 5 crores (USD 1.2 million) in at least one of the ten years of the study period and for which there was data for at least three years out of the ten-year period. Therefore, we exclude an additional 76 firms, and we retain a final panel of 206 firms that faced the 1995 trigger event. However, *Prowess* data are missing for some firms during some years. Accordingly, we conduct an unbalanced panel analyses with 1,104 observations, which equals an average of 196 firms per year, each with an average of 5.6 years of data out of the possible 9 years (explanatory variables lagged by 1 year).

### Measures

**Dependent Variables.** We measure the *product market internationalization* of a firm as the ratio of foreign sales to total sales, the most common measure of internationalization (Ramaswamy, Kroeck, and Renforth 1996). We choose the ratio of foreign sales to total sales over other possible measures, such as international geographic spread, growth in foreign sales, or foreign direct investment (FDI), for two reasons. First, the validity of any measure must be assessed on the basis of its potential explanatory power in the context of the theoretical assumptions on which it is based (Hassel, Hopner, Kurdelbusch, Rehder,

and Zugehor 2003). Because a majority of firms from emerging economies remain in the early stages of the internationalization process and use exporting as the dominant mode of international expansion (Aulakh et al. 2000), this measure is contextually appropriate compared with more involved internationalization measures, such as FDI. Second, though we have data about foreign sales intensity for all firms, data availability for the other variables is limited to a few firms and a few years because of data-related challenges stemming mainly from poor disclosures by firms. This second reason prompts us to carry out validity checks using available data on alternative measures.

We gather additional data through annual financial reports of the top one-third of our sample firms in terms of size; we obtain data about “the number of countries exported to” (count measure of diversity) for 31 companies for three years, ending in 2006. The count measure is a widely used measure of internationalization (Gomes and Ramaswamy 1999). The Pearson correlation between the foreign sales intensity and the count measure of diversity is positive and significant ( $r = .25, p < .02$ ). Thus, our measure of foreign sales intensity for product market internationalization is contextually appropriate and correlates reasonably well with another commonly used measure.

Following the lead of various studies which report that financial measures are highly correlated with other measures of performance (Chakravarthy 1988), we choose two commonly used financial measures of *firm performance*: return on sales (ROS, measured as profit before interest and tax divided by total sales) and return on assets (ROA, measured as profit before interest and tax divided by average total assets). We adjust both for nonrecurring transactions.

**Independent and Moderator Variables.** Similar to other closed economies, government regulations and controls have prevailed in India on transactions involving foreign exchange. Therefore, all Indian companies registered under the Indian Companies Act must record and disclose detailed accounts of their foreign exchange spending. We uncover three specific categories of annual foreign exchange spending related to inflows of *international technology resources* (Kumar and Aggarwal 2005): capital goods, royalty and know-how, and raw materials. The import of state-of-the-art capital equipment for manufacturing and R&D is the most common means by which emerging economy firms try to catch up

with the latest technologies of the developed world. Whereas capital goods represent a tangible side, royalty and know-how represent intangible technological assets. Finally, we include foreign exchange spending on raw materials because Indian pharmaceutical firms historically have possessed significant cost advantages in raw materials and manufacturing processes, which constituted a core competitive advantage. The import of any raw materials from international markets therefore likely occurs only in areas in which they are technologically deficient and hence can be treated as a means to obtain technology resources. Thus, our measure of international technology resources is the sum total of annual foreign exchange spending on capital goods, royalty and know-how, and raw materials, as a percentage of total annual sales.

Inflow of *international financial resources* into firms in India can occur through two broad means: the issue of new equity shares on international stock exchanges or raising foreign exchange debt through the issue of debt securities and/or foreign exchange loans. To raise foreign exchange through equity, Indian companies typically issue equity securities, such as ADRs or GDRs, which can be traded on international stock exchanges or among financial institutions. Similarly, Indian companies raise foreign exchange in debt by issuing debt instruments such as Eurobonds, Eurodollar bonds, or plain foreign currency loans. A year-wise, firm-wise listing of all such foreign exchange equity and debt issues by Indian firms is available in CMIE *Prowess*. The measure of international financial resources is calculated as follows:

$$(\text{International Financial Resources})_{it} = \frac{\{\sum_{t=1 \text{ to } T} (\text{Forex equity} + \text{Forex debt})_i\}}{\text{Total Liabilities}_{it}}$$

We operationalize a firm's *business group membership* with a dummy variable that takes the value of 1 if the firm is affiliated with a business group and 0 if not. To identify group affiliation, we adopt the CMIE Prowess classification of firms into groups, following Khanna and Palepu (2000a) and Bertrand et al. (2002).

To capture the dynamic effects of international technology and financial resource inputs on product market internationalization over the ten-year study period, we create a *post-liberalization time-*

*clock* variable (Amburgey, Kelly, and Barnett 1993, Baum, Korn, and Kotha 1995). Liberalization in the Indian pharmaceutical industry kicked off with India agreeing to introduce product patents in late 1994. The time-clock variable assumes positive integer values of one to ten corresponding to the ten years of the data used in this study.

**Control Variables.** To control for possible confounds, we include a comprehensive set of variables. The size of the firm constitutes a critical control variable, because larger firms may be better positioned to access international resources, whether technology or finance, as well as to internationalize their product markets. *Firm size*, measured as the natural logarithm of total assets, thus controls for size effects. The second critical set of control variables pertain to the endogenous pool of knowledge, resources, and capabilities, unique to each firm, which may account for a significant part of the variance in the product market internationalization levels of the sample firms. We capture these heterogeneous resources and capabilities using three variables related to stocks of technical, marketing, and experiential capabilities. Accordingly, we measure *innovation capability* using the ratio of the percentage of annual R&D expenses to sales. *Marketing intensity* equals the ratio of the percentage of total annual marketing expenses (including advertising, sales promotions, and sales and distribution expenditures) to sales. The *age* of each firm since it was founded, in years, serves as a measure of experience. Finally, prior year performance may influence a firm's outlook about embarking on international expansion, so we use *prior sales growth*, or the percentage growth in sales of the firm lagged by one year, as our last control variable. Because the entire data set pertains to a single industry, no industry controls are needed.

## MODEL SPECIFICATION AND RESULTS

As we include a near-census of substantial firms within the Indian pharmaceutical industry (KPMG 2006), we believe that the likelihood of sample selection bias is minimal. We estimate our models using random effects generalized least squares panel regression procedures. We choose random effects procedure as we have an important time-invariant predictor variable (business group), which fixed effects models would find difficult to incorporate. In addition Hausman (1978) test results support a random effects specification. We perform two robustness checks on all models, given the proportional

nature of the dependent variable. A logit transformation can model proportions (Greene 1997), so we cross-check our results by transforming the dependent variable. Finally, we report standard errors and  $p$ -values using the heteroscedasticity-consistent White's (1980) robust standard errors as an additional conservative measure.

We test H1, H2, and H4 by modeling product market internationalization as a function of international technology and finance resources, business group membership, post-liberalization time-clock, innovative capability, marketing intensity, firm size, age, and prior sales growth. To separate the year effects, we incorporate nine year-dummies for the ten years of data. We lag the focal independent variables—international technology resources, international finance resources, innovation capability, marketing intensity, and growth in sales—by one year. To test H3a, H3b, H5a, and H5b, we use interaction and subgroup analyses. The individual variables are mean-centered before we compute the interaction terms.

We test H6 using a two-stage least squares instrumental variable (IV) regression model for panel data. In the first stage, we model product market internationalization as a function of international technology resources, international financial resources, and firm size, which serves as the instrumental variable. In the second stage, firm performance appears as a function of product market internationalization, calculated from first stage, the square term of product market internationalization, and all other independent variables. The IV procedure improves our confidence in the estimation of the coefficient of product market internationalization.

[INSERT TABLE 1 HERE]

In Table 1, we report the descriptive statistics and product moment correlations for all variables. We perform collinearity diagnostics by computing variance inflation factors (VIFs) and eigenvalues for all independent variables, including the interaction terms. The VIF values range from 1.09 to a maximum of 3.9 with a mean VIF of 1.56, which indicates multicollinearity is not an issue. The results related to the determinants of product market internationalization appear in Table 2. Although we do not report the results of the estimations that employ the logit transformation of the dependent variable, they are identical

to those reported in terms of the signs and statistical significance of the coefficients. The results of the testing for main effect hypotheses appear in Model 1 in Table 2. The overall model is significant (Wald chi-square = 170.02,  $p < .001$ ). In terms of the individual hypotheses, the coefficient for international technology resources is positive and significant ( $b = 0.25$ ,  $p < .001$ ), in strong support of H1. We also find support for H2, because the coefficient for international financial resources is positive and significant ( $b = .11$ ,  $p < .05$ ). Our third main effects hypothesis (H4) relates to the impact of business group affiliation on product market internationalization. The negative and significant coefficient ( $b = -0.10$ ,  $p < .001$ ) supports H4 and suggests that business group-affiliated firms are less likely to embark on product market internationalization in response to institutional transformation than are their unaffiliated counterparts.

[INSERT TABLE 2 HERE]

Hypotheses 3a-b and 5a-b examine the moderating role of the post-liberalization time-clock and business group affiliation respectively on the impact of international technology and financial resources on product market internationalization. To test these hypotheses, we first add the interaction term between the time-clock and international technology resources to Model 1 (Table 2, Model 2). Then we add the interaction term between time-clock and international financial resources to Model 1 (Table 2, Model 3). The two interaction terms related to business group affiliation are entered one by one in a similar manner to yield Models 4 and 5 (Table 2). Model 6 includes all four interaction terms. The signs, values, and significance levels of the coefficients of the interaction terms are identical for the six models; therefore, we only discuss the results of the full model (Model 6). Model 6 is significant (Wald chi-square = 173.49,  $p < .001$ ), as is the change in the Wald chi-square between Models 1 and 6 ( $p < .01$ ), which indicates significant interaction effects.

We had proposed that the impact of international technology and financial resources on product market internationalization would be dynamic, with differential relative importance in the post-liberalization era. We find some support for this claim when we use the time-clock as a continuous measure and examine its interactions with the two types of resources. As we show in Model 6 of Table 2, the coefficient for the international technology resources  $\times$  time clock interaction variable is positive and

weakly significant ( $b = .08, p < .10$ ), whereas the coefficient for the international financial resources  $\times$  time clock interaction is positive and insignificant ( $b = .01, p > .10$ ). Because imports of technology and financial resources by individual firms could be non-uniformly distributed over time, and given our interest in examining dynamic effects in early and later stages of the post-liberalization era, we perform subgroup analyses (Aiken and West 1991, Irwin and McClelland, 2001, Venkatraman 1989), in which we divide the sample data into two groups: the first five-year period and the second (last) five-year period. We then regress product market internationalization on international technology resources, international financial resources, and the control variables separately for the first and last five-year period sub-samples. We graphically display the results in Figure 2. For the first time period (1995–1999), the coefficient for technology resources is positive and significant ( $b = .15, p < .01$ ), but that for financial resources is insignificant ( $b = -.02, p > .10$ ). This finding supports our argument (H3a) that international technology resources are relatively more critical during the immediate post-liberalization period as a means to kick-start product market internationalization in response to institutional changes. During the second time period (2000–2004), financial resources become critical for product market internationalization, with a positive and significant coefficient ( $b = .14, p < .05$ ), and technology resources continue to have a significant impact ( $b = .19, p < .001$ ). Thus, as hypothesized (H3b), over time, internationalizing firms indulge in more investment-oriented foreign market participation, as they may increase both the depth and breadth of their participation in different value chain activities in foreign markets. During this stage of international involvement, accessing international financial resources becomes critically important. Our results also show that technology resources become even more important over time—an intriguing finding that suggests a few possibilities, which we discuss in more detail in the next section.

[INSERT FIGURE 2 HERE]

In H5a and H5b, we had proposed that the impact of international technological and financial resources on product market internationalization would be greater for non-business group–affiliated firms than for business group–affiliated firms. We find support for these hypotheses. The beta coefficient for the international technology resources  $\times$  business group interaction term is negative ( $b = -0.12, p < .05$ ),

in support of our contention about the greater importance of international technology resources for unaffiliated firms. Similarly, we find that international financial resources play a much greater role in product market internationalization of unaffiliated firms ( $b = -0.01, p < .10$ ).

A similar subgroup analysis to understand the nature of the interaction between business group membership and international technology and financial resources reveals some interesting results. The upper graph in Figure 3 indicates that though international technology resources positively influence internationalization for both business group firms ( $b = .15, p < .05$ ) and independent firms ( $b = .28, p < .001$ ), the impact is almost twice as great for the latter. The contrast is even sharper with regard to the impact of international finance resources, as we show in the lower graph of Figure 3. Although the impact is negligible for business group firms ( $b = .04, p > .10$ ), international financial resources have a significant positive impact on internationalization in the case of non-business group-affiliated firms ( $b = .13, p < .01$ ). The subgroup analysis thus clearly highlights the significantly greater influence of international technological and financial resources on internationalization for independent firms compared with group-affiliated firms and provides support for both H5a and H5b.

[INSERT FIGURE 3 HERE]

In Table 3, we present the results related to the impact of product market internationalization on firm performance (H6). We had proposed an inverted U-shaped relationship. Accordingly, we estimate two measures of performance (ROA and ROS) as a function of product market internationalization and its square term, while controlling for other variables. As we show in Table 3, both models are significant, and the impact of product market internationalization on ROS ( $b = 51.55, p < .001$ ) and ROA ( $b = 27.61, p < .10$ ) is positive and significant. Similarly, the impact of the square term of product market internationalization is negative and significant on both ROS ( $b = -5.58, p < .001$ ) and ROA ( $b = -2.63, p < .10$ ), in support of H6.

[INSERT TABLE 3 HERE]

## DISCUSSION AND CONCLUSIONS

From both phenomenon and theoretical perspectives, our understanding of emerging economy multinationals (EMNC) remains in its infancy. Their rise continues to be striking, prompting Boston Consulting Group to declare that “[a] revolution in global business is under way” (Aguilar, Bhattacharya, Bradtke, Cotte, Dertnig, Meyer, Michael, and Sirkin 2006, p. 5). The leading 100 EMNCs accounted for \$715 billion in revenue in 2004. Furthermore, 28% of their revenues were generated from international sales. Although EMNCs thus have become a sizeable and rising feature of the world economy, “literature on emerging MNCs is mostly based on few anecdotal evidence, and deduction and inference from the history of North–South capital flows, rather than on a large body of systematic research” (OECD 2006, p. 3). Our research offers a modest attempt to understand, within the empirical context of Indian pharmaceutical firms, the strategic transformation of erstwhile domestic firms from protected economies, into global forces to be reckoned with. Our central thesis is that the internationalization of resources and markets constitutes an important driver of transformation for local firms from emerging economies and is central to an understanding of the phenomenon of emerging multinationals.

After controlling for various firm-level variables, we find that the internationalization of the technology and financial resource bases of emerging economy firms drives their participation in international markets. Therefore, our results shed light on recent questions that have been posed in the literature regarding the enablers that allow emerging economy firms to compete with established multinationals in developed markets (Hitt et al. 2005, Mathews 2006). Our findings extend the extant literature, which suggests that in response to market liberalization, domestic firms in emerging economies tend to exploit their current resources and competencies and integrate themselves into the value chain of Western multinationals (Dawar and Frost 1999) or find other emerging markets in which they can leverage their ability to operate in markets with institutional voids (Khanna and Palepu 2006). Though market reforms pose threats in the form of enhanced competition and new regulatory rules, they also present domestic firms with easy access to global technology and capital markets. Leveraging business models that have been honed over time by operating in low-cost, low purchasing-power markets and

serving customers at the “bottom of the pyramid” (Prahalad 2005), these firms may now kick-start their global ambitions by leveraging existing capabilities with renewed technology platforms sourced from international suppliers and financial resources attained through global capital markets.

To investigate further whether Indian pharmaceutical firms built innovation capabilities through internationalization, we conduct some additional analysis. We collect data from annual reports from 31 firms over a three-year period up to 2006 on four, relatively more direct measures of innovation capability: proportion of sales of formulations or end-products in total foreign sales (reflecting value-added foreign sales), abbreviated new drug applications (ANDAs), drug master files (DMFs) filed in the United States, and new chemical entities (NCEs) under development.<sup>2</sup> In the context of this industry, these measures reflect a firm’s innovation capabilities (CRIS INFAC 2004). We find that R&D intensity correlates positively with all four additional measures of capabilities: value-added foreign sales ( $r = .43, p < .001$ ), DMFs ( $r = .29, p < .001$ ), ANDAs ( $r = .51, p < .001$ ), and NCEs ( $r = .71, p < .001$ ). We regress R&D intensity on product market internationalization as the main predictor variable while controlling for other variables in our previously elaborated models and find that the impact of product market internationalization on R&D intensity is both positive and highly significant ( $b = .04, p < .001$ ), which provides preliminary support for the idea that Indian firms may have developed innovation capabilities by participating in international resource and product markets.

We also find significant differences between business group-affiliated and independent firms in their use of resource and product market internationalization as an engine of transformation. First, independent firms in our sample are more likely than business group-affiliated firms to internationalize their product markets in response to institutional changes in the industry. This finding validates recent research in different national contexts (e.g., Hoskisson et al. 2005, Kriauciunas and Kale 2006, Newman

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<sup>2</sup> The ANDAs are mandatory regulatory filings with the U.S. FDA, whose approval is needed before a firm can launch and market a drug in finished dosage form in the United States. A DMF is a submission that provides detailed information about facilities, processes, or articles used in the manufacturing, processing, packaging, and storing of one or more human drugs. The NCE is a chemical molecule developed by the innovator firm in the early drug discovery stage, which, after undergoing clinical trials, may translate into a drug that could be a cure for some disease.

2000) that reveals organizational inertia and embeddedness in institutional frameworks constrain business group-affiliated firms from transforming themselves to match the new environmental realities. For example, Hoskisson et al. (2004) find that business group-affiliated firms in several French civil law countries in Europe and Latin America are more responsive than unaffiliated firms to new domestic market opportunities but less so to international competitive changes and economic liberalization policy initiatives. Second, internationalization of technology and financial resources as a precursor to product market internationalization appears less important for business group-affiliated firms. Specifically, international financial resources have no impact, but international technology resources have a positive impact on market internationalization, though the size of this effect is smaller than that for unaffiliated firms. These findings therefore suggest that the presence of internal capital markets within business groups and/or their preferential access to domestic capital markets continue to play important roles in our study context, even in the post-liberalization era, because accessing global capital markets is not an imperative for business group-affiliated firms. However, these business groups do not appear self-sufficient in terms of other critical resources, such as technology, needed to compete internationally. Thus, accessing international technology resources becomes important for group-affiliated firms too, as they compete in international markets.

Finally, we find that the relative importance of international technology and financial resources for product market internationalization changes over time. The impact of international financial resources is found to be relatively higher in the latter period of post-liberalization era, whereas international technological resources are found to be important throughout the study period. We offer two plausible reasons for the latter finding. First, it is possible that external and internal know-how play synergistic roles. Technology imports become even more valuable as a firm develops its own base of know-how over time, because its enhanced absorptive capacity enables the newly internationalizing firm to identify and acquire higher-quality resources from outside, better assimilate them with its own scientific know-how, and successfully commercialize them (Cohen and Levinthal 1990). Second, anecdotal evidence suggests that over time, these firms move up into value-added products. As they move from bulk drugs to

formulations to developing new chemical entities that can be patented, their need for more cutting-edge know-how in domains related to the drug discovery process increases. Although our measure does not allow us to account for the quality of technology imports, it seems a plausible conjecture that evolving product lines further enhance the importance of foreign technological know-how over time.

### **Contributions**

Our contribution to the literature is on a number of fronts. First, our research directly responds to Uhlenbruck et al.'s (2003) call to identify factors that foster organizational transformation in response to institutional transitions. Although firm activities, such as product development, have been identified as sources of dynamic capabilities (Danneels 2002), our findings indicate that strategic choices related to the geographic scope of a firm also can lead to such second-order transformations (Newman 2000). Second, we add to growing efforts within the strategy field to identify events that catalyze searches for new strategic paradigms and sources of new capabilities (Ethiraj et al. 2004, Helfat 2000). Our study demonstrates how government-induced institutional changes signal crises and act as triggers that shape exploratory searches for resources and markets. Third, we contribute to the growing stream of research on emerging economy firms by testing important theoretical ideas in this context. Most existing research is based on case studies (e.g., Dawar and Frost 1999, Williamson and Zeng 2004) and suggests that post-liberalization, emerging economy firms are better off pursuing defensive strategies in the face of multinational entrants into their domestic markets. For firms following more offensive international strategies, prescriptions generally include taking a supportive role in the global supply chain of established multinationals or merging with a multinational (Khanna and Palepu 2002). However, in contrast with this conventional wisdom, Indian pharmaceutical firms took the international offensive strategy, built on foundations of access to quality resources from international technology and financial markets. Firms sustained their competitive advantage, despite the disruptive institutional changes, by engaging in an iterative process of resource and product market reconfiguration.

This study also provides insights with important implications for managers and policymakers. Emerging economy firms that effectively tap resources from international markets can improve their

product market internationalization as well as their performance. These insights contribute to one of the most widely debated issues in corporate board rooms of local firms in emerging economies: Is globalization and liberalization a boon or a bane for local firms? The findings help allay the concerns of many chief executives of local firms in emerging economies, that after liberalization, their markets would be swamped by foreign multinationals and local firms would perish. Rather, the economic reform measures undertaken by emerging economies are as much an opportunity, as a threat for local firms. These firms can overcome their traditional limitations through the internationalization of resources and exploit their unique competitive advantages, developed over the years, to succeed in international markets. Our study also contributes to the debate between economists and policymakers about the implications of liberalization for domestic economies in developing countries (Balasubramanyam 2003, Newman 2000, Pradhan 2004). Those in favor of liberalization tend to argue that opening the economy will improve the competitiveness of the domestic firms and facilitate their integration into the global economy (UNCTAD 2004); others express concerns that it will lead to a predominance of foreign multinationals at the cost of local firms (Newman 2000). Although the nature of the debate is too broad to be settled by just a few studies, this research provides some evidence regarding how economic liberalization can facilitate greater competitiveness in local firms. As anticipated by Indian policymakers, economic liberalization helped these firms access foreign capital, import technologies, raw materials, and so forth and thus become more globally competitive. These findings should signal governments in various countries, which continue to actively discourage import activities through tariff and non-tariff barriers while providing economic support to international expansion activities. Policymakers from emerging economies should note that better export performance in an economy may be achieved through policy measures that facilitate the acquisition of international resources to complement indigenous advantages.

### **Limitations and Future Research Directions**

We highlight a few limitations of the paper, some of which also provide directions for further research. The first limitation of our study pertains to the issue of the generalizability of single-industry studies. The conclusions we draw here are indicative, but we assert that they may be applicable to other

industries as well as other emerging economy contexts. For example, two other major industries in India have a global presence: automotive and its ancillaries and information technology services. In these industries, technological capabilities remain the fountainhead of overseas business development efforts. Domestic sources for technology are inadequate, and firms must tap international markets to access and internalize the state-of-the-art technology. Similarly, in other national contexts, government policies are geared towards attracting foreign direct investment (FDI) to foster organizational transformation of indigenous firms as these are fully or partially privatized. Along with capital, inward FDI brings international managerial and technological resources and the possibility of positive spillovers to host markets. Thus, resource internationalization as a component of organizational transformation of emerging economy firms is likely to be important in diverse national and industry contexts. Future research could identify different types of resources and link those to diverse paths of organizational transformation in various industries and institutional contexts.

In addition, our study limits its focus on product market internationalization and its determinants. Although we obtain some other aspects of internationalization for a limited number of firms, general data limitations preclude us from examining the different modes and breadth of internationalization in detail. Moreover, our measure of product market internationalization (foreign sales as a proportion of total sales) is coarse. More fine-grained entropy measures that incorporate both the breadth (e.g., number of countries) and depth (relative importance of each market) of internationalization would provide a better indicator of product market internationalization (Hitt et al. 1997). Ostensibly, the aim of firms within the pharmaceutical industry is to become globally competitive by dispersing value chain activities across the globe, which may entail FDI activity. Further research examining asset-seeking internationalization may shed more light on the transformation of these firms into full-fledged multinationals.

A logical extension of our research would be to examine whether the internationalization-related transformation of emerging economy firms leads to capability enhancement. From a public policy perspective, the objectives of economic liberalization include export-led growth and enhanced capabilities in value-added manufacturing industries that enable a broader shift in the economy away from traditional

commodity goods. Although such economic reforms have yielded country-level benefits, as reflected in positive trade balances and accelerated economic growth, there is a continuing concern that this economic growth has not been associated with enhanced capability development among indigenous firms to enable them to compete successfully in value-added products and services in global markets (Wagner 2007). We attempt to examine the association between product market internationalization and the R&D intensity of pharmaceutical firms in our sample and find a positive and significant association. Although this finding supports previous research using similar measures of innovation capabilities (e.g., Hitt et al. 1997), which suggests that more international firms spend more on R&D as a percentage of total sales, additional research should systematically examine the impact of both resource and product market internationalization with more appropriate measures of innovation capability.

We use a broad classification in our conceptualization and empirical testing of business group effects, though we acknowledge that different types of business groups (e.g., more versus less diversified, family versus professionally managed), with differential resource endowments, organizational structures, and interorganizational ties may exhibit unique responses to institutional changes (Hoskisson et al. 2005, Khanna and Rivkin 2006).

We believe that this research represents an important step in researching a topic that goes to the very root of globalization and liberalization in emerging market economies. A potentially rich area for theory building thus is open—the role of firm-level factors in shaping the internationalization process and the strategies of emerging economy firms. Additional large sample studies in multiple industries and different geographical and institutional contexts should attempt to refine and validate our hypotheses and formulate new ones. Such studies may go a long way to clarifying the important linkages between changes in resource and capability configurations and outward change.

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**Table 1**  
**Means, Standard Deviations, and Correlations**

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1 Product market internationalization	0.19	0.24											
2 Return on assets (ROA)	0.15	0.26	.06										
3 Return on sales (ROS)	0.09	0.21	.12	.46									
4 International technology resources	0.15	0.99	.07	.05	.09								
5 International financial resources	0.05	0.15	.13	-.01	.04	.00							
6 Innovation capability	0.01	0.05	.12	.03	.12	.01	.03						
7 Marketing intensity	0.06	0.07	-.02	.04	-.09	-.04	.09	-.01					
8 Firm size	19.77	1.50	.30	.20	.25	.02	.22	.14	.06				
9 Firm age	20.35	16.62	-.05	.13	.04	-.05	.02	.00	.25	.23			
10 Sales growth	0.31	1.93	.00	-.02	-.02	.12	-.02	.21	-.06	-.02	-.08		
11 Business group dummy* (0-non-group; 1-group)	0.32	-	-.03	.05	.00	-.00	.03	.13	.09	.39	.21	-.01	
12 Post-liberalization time-clock	5.50	2.88	.13	-.01	-.02	-.05	.17	.03	.08	.20	.17	-.08	.00

\*Percentage of firms with dummy 1.

Notes: Correlations greater than .06 are significant at  $p < .05$ . Correlations greater than .07 are significant at  $p < .01$ .

**Table 2**  
**Results of Panel Estimation with Product Market Internationalization as the Dependent Variable<sup>a</sup>**

	<b>Model</b>					
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
International technology resources (1 yr lag) <b>(H1)</b>	0.25***(0.07)	0.23***(0.07)	0.25***(0.07)	0.25***(0.07)	0.24***(0.07)	0.23***(0.07)
International financial resources (1 yr lag) <b>(H2)</b>	0.11* (0.06)	0.11* (0.06)	0.11* (0.06)	0.10* (0.06)	0.10* (0.06)	0.11* (0.06)
Business group dummy (0-non-group; 1-group) <b>(H4)</b>	-0.10***(0.03)	-0.10***(0.03)	-0.10***(0.03)	-0.10***(0.03)	-0.09***(0.03)	-0.10***(0.03)
Post-liberalization time-clock	0.03* (0.02)	0.03* (0.02)	0.03* (0.02)	0.03* (0.02)	0.03* (0.02)	0.03* (0.02)
Time-clock × International tech resources <b>(H3a)</b>		0.09 <sup>+</sup> (0.06)				0.08 <sup>+</sup> (0.06)
Time-clock × International financial resources <b>(H3b)</b>			0.01 (0.01)			0.01 (0.01)
Business group × International tech. resources <b>(H5a)</b>				-0.12* (0.06)		-0.12* (0.06)
Business group × International fin. resources <b>(H5b)</b>					-0.01* (0.01)	-0.01 <sup>+</sup> (0.01)
Innovation capability (1 yr lag)	0.22 <sup>+</sup> (0.15)	0.22 <sup>+</sup> (0.15)	0.23 <sup>+</sup> (0.15)	0.24 <sup>+</sup> (0.15)	0.22 <sup>+</sup> (0.15)	0.24 <sup>+</sup> (0.15)
Marketing intensity (1 yr lag)	0.13** (0.06)	0.12** (0.06)	0.13** (0.06)	0.12* (0.06)	0.12** (0.06)	0.11* (0.06)
Sales growth (1 yr lag)	-0.00 <sup>+</sup> (0.00)	-0.00 <sup>+</sup> (0.00)	-0.00 <sup>+</sup> (0.00)	-0.00 (0.00)	-0.00 <sup>+</sup> (0.00)	-0.00 <sup>+</sup> (0.00)
Firm size	0.06***(0.01)	0.06***(0.01)	0.06***(0.01)	0.06***(0.01)	0.06***(0.01)	0.06***(0.01)
Firm age	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)	-0.00* (0.00)
Constant	-1.02***(0.14)	-1.02***(0.14)	-1.01***(0.14)	-1.02***(0.14)	-1.03***(0.14)	-1.03***(0.14)
<b>Model Indices</b>						
Wald chi-square	170.02***	169.16***	171.65***	172.32***	170.38***	173.49***
Adjusted R-square	0.2073	0.2108	0.2073	0.2089	0.2064	0.2109
Number of observations	1104	1104	1104	1104	1104	1104

<sup>+</sup> $p < .10$ , \*  $p < .05$ , \*\* $p < .01$ , \*\*\*  $p < .001$ . Significance levels are based on robust standard errors and one-tailed tests.

<sup>a</sup> Unstandardized regression coefficients reported; White's robust standard errors in parentheses. The changes in Wald chi-squares across the models are statistically significant at least at  $p = .10$ .

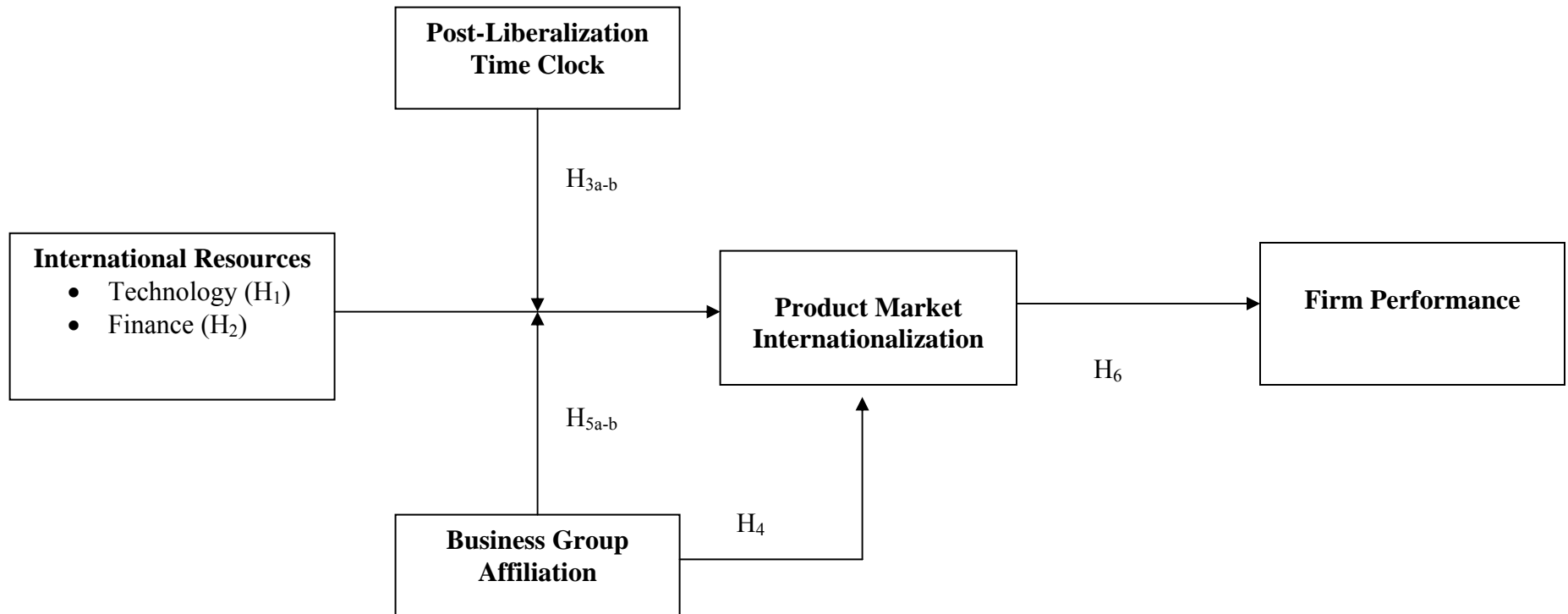
**Table 3**  
**Results of 2SLS Panel Estimation with Firm Performance as the Dependent Variable<sup>a</sup>**

	Return on Sales (ROS)		Return on Assets (ROA)	
	(1)		(2)	
Product market internationalization	51.55***	(16.18)	27.61 <sup>+</sup>	(17.49)
Product market internationalization (square term)	-5.58***	(1.76)	-2.63 <sup>+</sup>	(2.06)
Business group (0-non-group; 1-group)	1.05	(2.54)	2.78	(2.50)
Post-liberalization time-clock	0.02	(0.29)	0.09	(0.44)
Innovation capability (1 yr lag)	-15.76 <sup>+</sup>	(9.99)	-17.31	(14.73)
Marketing intensity (1 yr lag)	-24.93**	(8.39)	-20.00*	(11.76)
Sales growth (1 yr lag)	-0.46*	(0.24)	-0.26	(0.37)
Firm age	0.06	(0.07)	0.22***	(0.07)
Constant	3.50 <sup>+</sup>	(2.53)	5.56 <sup>+</sup>	(3.75)
Model indices				
Wald chi-square	29.70**		25.35*	
Number of observations	1103		1104	

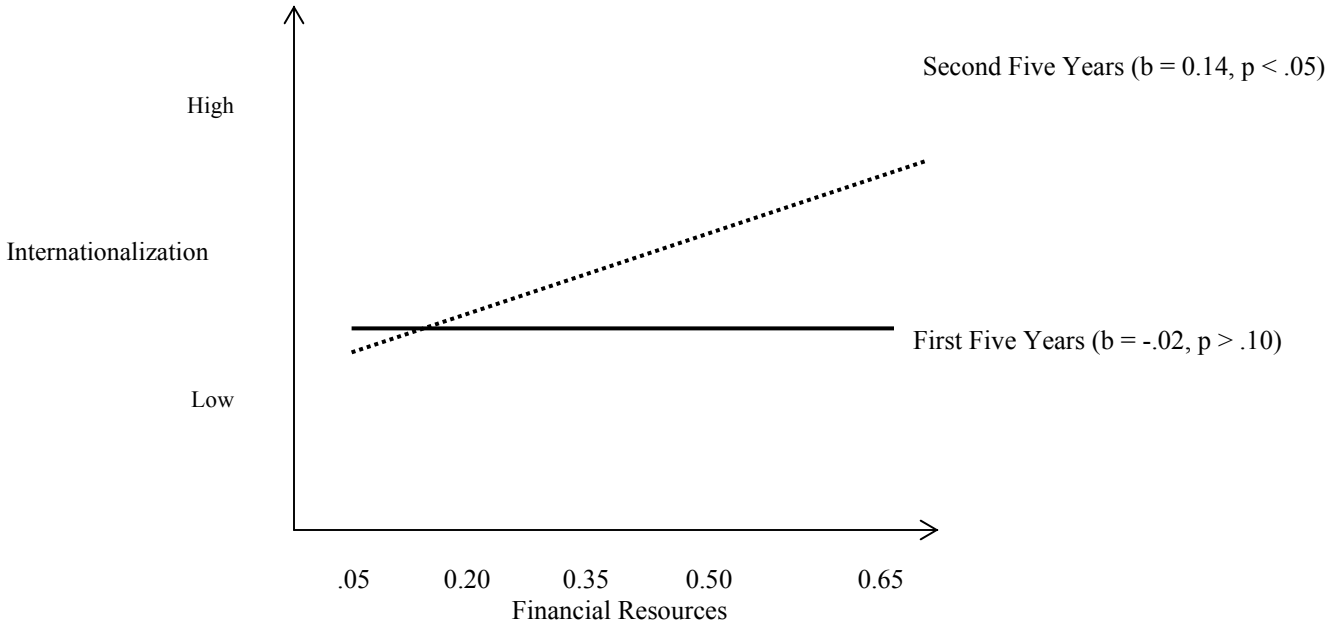
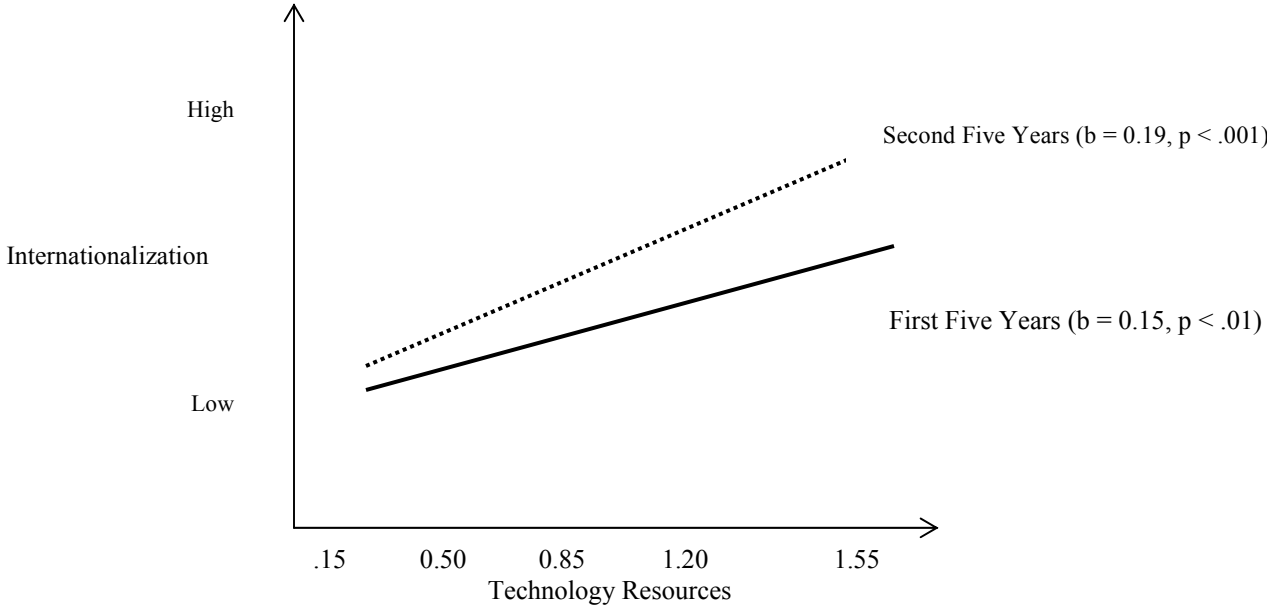
<sup>+</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Significance levels based on one-tailed tests.

<sup>a</sup> Unstandardized regression coefficients reported; standard errors in parentheses.

**Figure 1**  
**Conceptual Model**



**Figure 2**  
**Subgroup Analysis of the Moderating Role of Post-Liberalization Time-Clock**



**Figure 3**  
**Subgroup Analysis of the Moderating Role of Business Group Affiliation**

