

Knowledge management in technology-focused firms in emerging economies: Caveats on capabilities, networks, and real options

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Abstract In mature economies, technology-focused industries and the management of knowledge are widely viewed as critical to success. Increasingly, in emerging economies technology-focused industries and the management of knowledge are also viewed as important. To date, however, little is known about such activities in emerging economies. Particularly, it is not understood how knowledge management can impact efforts for corporate renewal in such environments. The literatures of the resource-based view of the firm, social capital/network theory, and real options theory are vital to providing insights for technology-focused industries and the management of knowledge in mature economies. In this paper we focus on the caveats when applying such theoretical foundations to emerging economies. To illustrate these issues we will draw on the largest emergent economy in the world, China.

Keywords Emerging economies · Social capital · Network theory · Real options theory · Corporate renewal

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Technology-focused industries are an increasingly important part of many emerging economies (Bruton & Rubanik, 2002). This concern for technology-focused industries is consistent with growth and is reflective of governmental efforts to expand these economies to focus on higher valued added products and services (Liming, 1998). However, many emerging economies have existing technology-focused industries that are in need of corporate renewal. For example, historically many emerging economies such as Russia were major forces in technology at one time. After all, Russians in the 1960s created the original hand calculator and placed the first man in space. However today, many Russian technology firms are in need of renewal. Clearly, this need for renewal by technology firms in emerging economies is not limited to Russia. There are similar outstanding technology-focused firms throughout the world, including Asia, where technology-focused need renewal. But, the understanding of corporate renewal and the role of knowledge management in these activities is yet to be substantially developed despite the fact that such issues are critical to emerging markets (Ahlstrom & Bruton, 2004).

Corporate renewal is a broad term which has many alternate meanings in the literature (see Sharma & Chrisman, 1999, for a comprehensive review). Further, scholars have used other terms which are quite isomorphic conceptually with corporate renewal. These include strategic renewal (Guth & Ginsberg, 1990), strategic change, revitalization, revival, transformation (Schendel, 1990), and organizational renewal (Stopford & Baden-Fuller, 1994). For our purposes, corporate renewal refers to key actions, or transformations, undertaken by an organization that results in significant changes to its business or corporate strategy and/or its structure which alter preexisting relationships within the organization or between the organization and its external environment (Sharma & Chrisman, 1999).

There is reason to believe that there will be differences in knowledge management in emerging economies which will impact corporate renewal efforts. To illustrate, it is known that information flows, which are a key component of knowledge management and which, in turn, impacts corporate renewal, occur differently in emerging economies (Jarvenpaa & Leidner, 1998). These information flows between the firm and external parties are different because institutional factors in emergent markets such as the role of the government and the absence of infrastructure can make knowledge a rare commodity (Jarvenpaa & Leidner, 1998). Such differences, in part, lead to different strategies for firms in emergent markets than for those in mature markets (Peng, 2000).

Knowledge management, and the role it plays in technology-focused businesses, has gained increased attention in recent years (Alavi & Leidner, 2001). In part, this focus on knowledge management is due to the recognition generated from the resource-based view of the firm that in order for a firm to gain a competitive advantage, it must possess resources that are rare, valuable, and not easily copied (Barney, 1991). The tacit capability represented by the knowledge within the firm is a resource that cannot be easily copied. Therefore, it potentially provides the competitive advantage proposed by the resource-based theory of the firm (Reed & DeFillippi, 1990). In fact, it has been argued that knowledge may be the most critical source of competitive advantage in a firm (Spender & Grant, 1996). As such, the understanding of knowledge management, its role in technology-focused business, and how it may be different in emerging economies as compared to mature economies, is important in understanding the ultimate success of firms in these economies.

Similarly, the examination of corporate renewal has only recently begun in emerging economies (Ahlstrom & Bruton, 2004). However, there is evidence that there are substantial differences in these domains in emerging economies (Bruton, Ahlstrom, & Wan, 2001, 2003). In large measure these differences are due to institutional and structural differences

in such domains. However, to date there has been little effort to understand how such differences can impact knowledge management and, in turn, corporate renewal.

We initially seek to understand knowledge management in technology-focused firms in emerging economies by establishing the foundations for knowledge management from the existing literature. We join the recent calls of others (e.g., Meyer, 2006; Tsui, 2006; Wright, Filatochev, Hoskisson, & Peng, 2005) who advocate research which explores the relevance of extant theoretical perspectives in the context of emerging economies. As noted by Meyer (2006: 119), “locally relevant knowledge requires the recognition of the boundaries of existing management knowledge and a careful contextualization of new research projects.”

Our paper is organized as follows (see Figure 1 for an organizing framework). Central to the context of knowledge-based firms is the resource-based view of the firm. After providing a brief overview of this perspective, we draw upon other literatures including social capital/social networks and real options theory. With each, we address *caveats* to these theoretical perspectives in the context of emerging economies. We conclude with a discussion of the implications for future descriptive and normative theory.

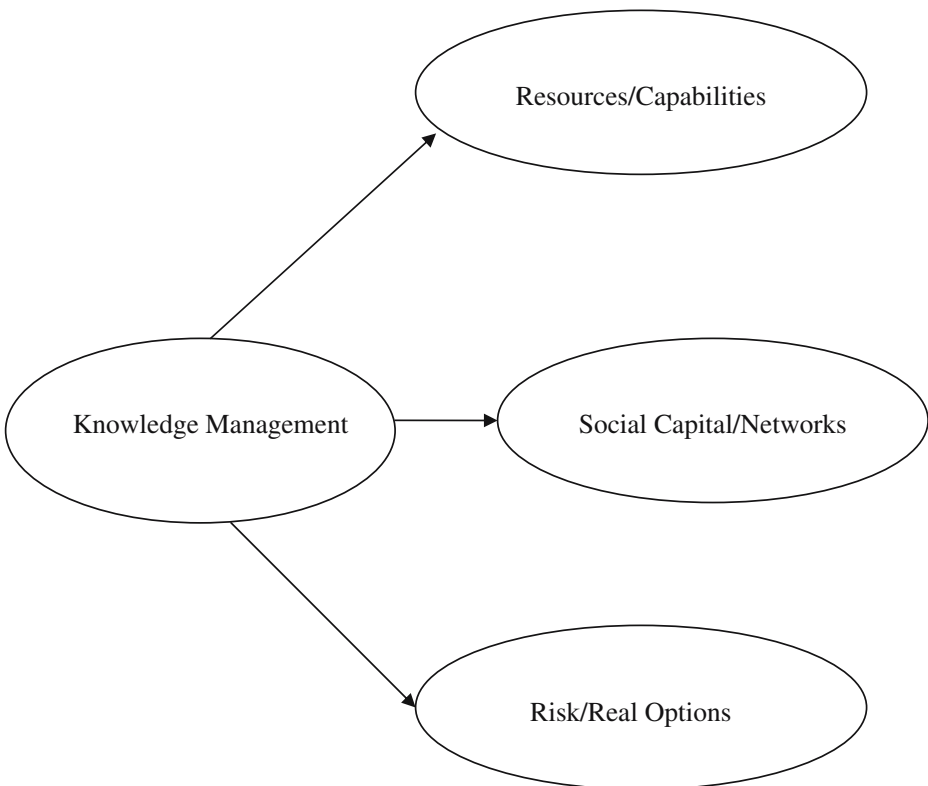


Figure 1 Some of the key elements of knowledge management

Knowledge management and the resource-based view

Emerging economies are “low-income, rapid-growth countries using economic liberalization as their primary engine of growth” (Hoskisson, Eden, Lau, & Wright, 2000: 249). The institutional setting in emerging economies is unique and the resulting strategies that are required to be successful in this environment are quite different than in mature economies. It is known that the information flows in firms are different in emerging economies (Jarvenpaa & Leidner, 1998). For example, in China the role of government is such that there is not a single level of government that has predominance, and competing levels of government exist (Boisot & Child, 1988). The result is that information is often a source of power which impacts its flow within and across organizations (Peng, 2000). However, it is unclear how other aspects of knowledge management may be different in emergent economies.

Wernerfelt (1984) and Barney (1991) argue that a firm’s competitive advantage is derived from *unique bundles* of resources that are difficult for competitors to duplicate—either through imitation or substitution. Typically, the duplication of such *bundles* will be difficult when they involve tacit knowledge, scarcity, and/or specialization of human assets (Lippman & Rumelt, 1982). In contrast, as noted by Barney 1991 (p. 110), “physical technology, whether it takes the form of machine tools or robotics or complex information management systems, is by itself typically imitable.”

A firm’s greatest potential source of competitive advantage is “the intangible firm-specific knowledge which enables it to add value to the incoming factors of production in a relatively unique manner” (Spender, 1996: 46). In fact, it has been argued that knowledge management is the most critical element of a business’s competitive success (Spender & Grant, 1996). There is substantial evidence to support the salience of knowledge management as a source of competitive advantage (c.f. McEvily & Chakravarthy, 2002). This is particularly true in high-technology firms where disruptive technologies are such a significant competitive threat (Munir, 2003).

The extensive focus of the resource-based view of the firm on knowledge management has led to what is referred to as a “knowledge-based” perspective of the firm in the strategic management literature (Alavi & Leidner, 2001). However, the definition of what knowledge is has not been universally agreed on (Spender, 1996). The most widely employed definition of knowledge is that it is something where a belief is justifiable as truth due to systematic analysis (Grant, 1996). However, more recent efforts have recognized that there are both explicit and implicit types of knowledge (Nonaka, 1994), and that there is knowledge at both the individual and the organizational levels (Spender, 1996). Thus, knowledge management is the acting of managing implicit and explicit organizational knowledge (Alavi & Leidner, 2001).

Caveats

As noted above, knowledge is a critical, intangible resource that can lead to a competitive advantage and better firm performance. One would expect that similar benefits can be obtained in high-technology firms in emerging economies. However, the ability to protect that knowledge may be more difficult in emerging economies.

The competitive environment in most emerging economies is particularly severe for most high-technology firms. And protecting a firm’s codified knowledge can be challenging. Patent laws, if they exist, are unenforceable in many emergent economies such as China (Peng, 2000). In addition, the fact that foreign market investment often takes place via

relationships with local partners increases the likelihood of information spillage and transfer. Similarly, Coff (1997) argued that resources embedded within individuals are much more at risk of rent appropriation than are resources which reside beyond individuals. By having to share knowledge with localized partners, information spillage becomes a potential threat. In turn, localized partners may then eventually compete against their former partner.

Further, much of the tacit knowledge a firm possesses can quickly become outdated (Bruton & Rubanik, 2002). For example, distribution channels can change quickly with new retail and wholesale establishments quickly entering and exiting the market. Thus, the knowledge of how to manage those distribution channels loses their competitive value. Finally, high-technology firms in emergent economies typically have even greater constraints on their other resources than do similar firms in mature economies (Bruton & Rubanik, 2002). Therefore, one caveat of what is expected in mature economies is that high-technology firms must actively manage their knowledge management to a greater extent in emerging markets if they are to be successful. As noted by Atuahene-Gima & Li (2004: 587): “new technology ventures in China face higher environmental uncertainty in terms of significant political and economic changes, a less developed institutional framework, and the increasing power of market competition.” Arguably, the key resource of the high-technology firm in emergent markets may be knowledge. And, aggressive competition can cause any missteps to become fatal.

Even if high-technology firms in emerging economies can protect their knowledge, and update that knowledge such that it does not become outdated, there still remains the challenge of differentiating the value of that knowledge to potential investors. Paradoxically, the easier it is for investors to see and value the firm’s knowledge, the easier it is for rivals to imitate it (Kogut & Zander, 1992). Likewise, the better a firm becomes at keeping its knowledge secure from imitation, the harder it is for investors to properly value the firm’s knowledge. Potential investors may fear loss from adverse selection (Akerlof, 1970). In an emerging economy, this may constrain firms from being able to finance their growth. The Chinese market has been widely described as a socialist economy with market characteristics. As a result, here (and in most emerging economies) the legitimacy of many firms is still questioned by authorities (Tsang, 1996). There are still many officials who still see private ownership as only a temporary activity that will ultimately disappear (Tsang, 1996). Thus, there remain widespread questions about the legitimacy of entrepreneurial ventures in China. This is particularly true for some technology-focused industries. For example, in a market such as China, the Internet is not only seen as an important new tool for business success but also as potentially a tool for subversives to employ against the nation. High-technology entrepreneurs who participate in Internet-related ventures in China must not only establish the viability of their venture but also the legitimacy of their venture (Ahlstrom & Bruton, 2001). Thus, another caveat for high-technology entrepreneurs in emergent economies is that they must develop and maintain the legitimate right to exist in the society as a key resource. They must do this not only as a viable business idea but also because they have a right to exist and will be a contributing member of society.

The right of businesses to exist in mature economies may be assumed but such is not the case in emerging economies. Ironically, this right is itself a potential source of relative competitive advantage. Peteraf (1993) noted that resources need not be singularly unique in order to create a competitive advantage. Firms which possess a rare (but not unique) resource, such as legitimacy, have an advantage over all other firms lacking this resource. Thus, in emerging economies attaining the right to exist can provide for a separating equilibrium, evidenced by different levels of firm performance.

Social capital and social network theory

Knowledge involves not only the knowledge held by the firm but also the knowledge held by individuals within the organization. Thus, the ability to manage knowledge involves interactions with and between individuals in firms as well as interactions among different firms and organizations. As a result, the social capital (or social relationships) that can be mobilized by the firm impacts its efforts to manage knowledge (Adler & Kwon, 2002). This is particularly true in technology-focused organizations (Dess & Shaw, 2001). The nature of the information flows in technology-focused firms involves greater tacit information that can be difficult to transmit (Hansen, 1999; Szulanski, 1996). Thus, the ability to explain new technological concepts and their market potential can be difficult. Ties among actors, or social capital, “create high-capacity information links ... that engender a motivation for information sharing, mitigating uncertainty and allowing the focal organization to vicariously benefit from the insights and experiences” (Nahapiet & Ghoshal, 1998: 248). The result is that the nature of the social capital between parties inside the firm and between firms can be critical to the success of technology-focused firm start-ups (Bruton & Rubanik, 2002).

The relationships or “ties” among individuals within a firm’s social network can be either *strong* or *weak*. According to Granovetter (1973), strong ties involve frequent interaction, mutual trust, and a high level of intimacy. Shared perspectives and backgrounds would also tend to engender trust among actors (Leana & Van Buren, 1999). This trust enhances the implementation of strategic initiatives and facilitates complex decision-making processes that are inherent in technology-focused organizations (Coleman, 1988).

However, the impact of strong social capital among parties is not always positive. Strong ties often limit the range, diversity, and breadth of social resources available to the organization (Nahapiet & Ghoshal, 1998) as well as suppress constructive conflict (Leana & Van Buren, 1999). Such tendencies erode an organization’s ability to respond faster to competitive challenges in the marketplace.

Weak ties, in contrast to strong ties, enable a firm to have greater access to a wide base of resources and information. This leads to a much broader perspective for a firm’s decision-making process (Kraatz, 1998). According to Burt (1992; 1997), networks in which individuals are unfamiliar with each other, i.e., those with structural holes, are more valuable to managers because of the nonredundant sources of information that such ties can contribute. Such a rich variety of informational sources is critical in fast-moving and complex knowledge-based industries (See Peng & Zhou, 2005, for a thorough discussion of the relative advantages of strong and weak ties in emerging economies such as China).

The use of interorganizational network relationships with customers, suppliers, and alliance partners is becoming an increasingly valuable means by which organizations combine resources and create value (Dyer & Singh, 1998). Knowledge-based industries, in particular, are increasing their reliance on forms of network governance, a means of coordination characterized by informal social systems instead of bureaucratic structures and formal contractual relationships (Ring & Van de Ven, 1994).

Caveats

The institutional setting in emergent economies is substantively different than in mature economies. Scott’s (1995) framework to analyze the institutional environment included three broad categories: *regulatory institutions* including the laws/regulations/codified

government policies of a nation; *normative institutions* are what is expected of individuals or organizations and includes professional standards such as those that regulate doctors and lawyers; and, *cognitive institutions* are constructed over time and are quite resilient and include issues such as the culture of the region.

In emerging economies, regulatory institutions are historically weak. For example, in China there has been a widely acknowledged devolution of power from the central government to other levels of government (Boisot & Child, 1988, 1996). One impact of this devolution of power has been that different levels of government frequently believe they are the rightful party to regulate a given activity. These regulations are often in conflict with each other and the interpretation and enforcement of these rules can be quite random (Ahlstrom & Bruton, 2002). Such weak regulatory institutions are, however, not unique to China. Similar situations have also been noted in Russia (Bruton & Rubanik, 2002).

Normative institutions typically impact professions. For example, the venture capital industry has strong normative institutions across the world (Bruton et al., 2003). However, these institutions tend to be weak in emerging economies and are typically focused on very specific professions and not widespread across industries. In particular, emerging economies may not have enough time for such normative institutions among professions to become well established (Ahlstrom & Bruton, 2002).

One result of weak regulatory and normative institutions is an increased reliance on cognitive institutions in emergent economies (Ahlstrom & Bruton, 2002). Similarly, Peng and Heath (1996) argue that such institutional constraints force firms to develop a network-based strategy of growth, building upon personal trust and informal agreements among managers and organizations. After all, if the legal environment cannot enforce a contract there must be some other means by which technology-focused firms can believe that suppliers will deliver the product they commit to deliver and that customers will pay for products they purchase. The glue that holds economic relations together in such environments is trust among the parties (Benson, 2001). The means by which such trust is developed and maintained is the social capital and social networks that exist among the parties.

The literature on social capital and social networks can provide insight into the management of the knowledge in technology-focused firms. However, a caveat that must be recognized is that the role of social capital and social networks may, in fact, be more important in emerging economies than in mature economies. The literature on business in the emergent markets of Asia has long recognized the value of social capital and networks when they discuss *guanxi* among ethnic Chinese (Fu, Tsui, & Dess, 2006; Luo, 1997; Tsui & Farh, 1997) or *blat* in Russia (Ledeneva, 1998), both of which represent relationships among the various parties. But to date, there have been limited efforts to connect the concepts of social capital/networks with that of such relationships (Hitt, Lee, & Yucel, 2002). It has been argued that such connections in the emergent markets of Asia are an important source of competitive advantage (Tsang & Walls, 1998).

Although few would question the salience of *guanxi* (or social relationships) at multiple levels of analysis (e.g., interpersonal, firm, interfirm) in China, several writers have raised the issue of how its relative importance may vary with regard to the extent to which market-oriented institutions become dominant in a society (Peng, 2005; Peng & Luo, 2000; Wright et al., 2005). That is, given that the costs associated with building social networks can be quite high, there becomes a point at which a limit is reached on the number and strengths of network ties that an individual or organization can reasonably handle (Peng, 2003). Thus, resources that may have become valuable in one set of institutional conditions may be less valuable in as the economy becomes more market-driven.

Risk and real options theory

Knowledge management is not a risk-free endeavor. For technology-focused firms, decision-making is encumbered by numerous risks, such as the loss of value by information spillover, imitation by rivals, rent appropriation by stakeholders, and risks associated with making decisions laden with adverse selection. The ability to manage knowledge within a technology-focused organization is also impacted by the risks faced by the organization and how that risk is managed. The greater the overall level of perceived risks, the more conservative the organization becomes towards the sharing of information within the organization and with others outside the organization (March & Shapira, 1987). Such conservatism hinders corporate renewal efforts, as well as negatively impacts efforts to leverage knowledge management. Sometimes these risks manifest themselves through countervailing conditions. Kogut and Zander (1992) identify a paradox highly applicable to technology-focused firms: being able to replicate processes and knowledge within the firm may lead to greater profits; however, they carry the risk of informational leakage and spillage. At the same time, efforts to prevent leakage and spillage serve also to limit replication, reducing the potential size of a competitive advantage. Hence, the managerial decisions about knowledge management and renewal are laden with various competing risks as well.

The first challenge for initiating discussions on risk centers on how best to define risk. The term “risk” is often clouded with polysemic meanings (Fischhoff, Watson, & Hope, 1984). By lacking agreement on how to define risk, the likelihood of the dangers of errant assessment increases, especially as we move from one nation and culture to another, and as we move from traditional towards knowledge-intensive firms (Janney & Dess, 2006). Employing risk measurements that are appropriate for traditional firms in mature economies may lead scholars to inaccurate results if those same measures are used in different environments with different cultures, or knowledge-intensive rather than traditional firms (Kogut, 1991). In this paper, we adopt the perspective more commonly found in the strategic management domain, “risk as a loss of resources or loss of survival” (March & Shapira, 1987). We believe that when risk is defined in terms of loss/failure, it creates stresses for corporate renewal, and hence may better explain why firms exhibit paralyzing behaviors. We also believe this perspective is more appropriate when growth opportunities are more heavily constrained by a lack of resources. This imbalance may occur from a lack of resources, but it may, as is often true in emerging economies, also occur from an excess of viable opportunities competing for resources.

Regardless of measurement approach, March and Shapira (1987) note that managers seek to either reduce the risk inherent in a given decision or to at least convince themselves that they have done so. One popular technique for reducing risk (or at least appearing to do so) is real options (McGrath, 1997, 1999). Although a real option is a risk neutral tool, the primary emphasis of its use has been focused on risk reduction, rather than seeking additional risk (e.g., Dixit & Pindyck, 1994; Janney & Dess, 2004; McDonald & Siegel, 1986). As a decision-making tool, real options serve to reduce risks by breaking a decision into multiple smaller ones, with commitment to later stages contingent on the outcomes of earlier stages. A real option represents the right, but not the obligation, to make a decision in the future, at advantageous terms (Bowman & Hurry, 1993; McGrath, 1999). That is, it is not merely a sequential decision, but one where a benefit accrues to making the initial decision now, and subsequent decisions later. The initial stage may provide for benefits such as exclusivity, first mover advantage, learning, or time diseconomies of scale. Later, after more

information has been revealed or gathered, firms can act on the option if it is favorable, or let it go if it is not (i.e., limiting their losses. Real options originated as a valuation tool for financial call options (Black & Scholes, 1973). However, its use has evolved from its emphasis on valuation towards a managerial approach to decision making under uncertainty (e.g., Dixit & Pindyck, 1994; Janney & Dess, 2004; McDonald & Siegel, 1986).

Incremental investing is the hallmark of the real options perspective, where each new round of investing occurs as new learning and knowledge has emerged and the investment has surpassed predetermined milestone achievements. Knowledge accumulates each round, permitting more rich information for subsequent decisions. Compared to full investment, incremental, option-based investment proves less risky. By keeping incremental investments (for any given investment) small, managers are encouraged towards greater overall risk taking activity (March & Shapira, 1987). Renewal is more likely to happen if managers are encouraged to make a decision, as opposed to holding back.

Less understood, but equally vital, is a second means by which real options reduce risk—through the creation of learning platforms. A key element of the real options managerial perspective is that it encourages exploration, learning, and the creation of knowledge. The real options managerial perspective encourages managers to lay the foundation for exploiting the unknown in order to obtain potentially valuable, future opportunities. This process is what Bowman and Hurry (1993) refer to as “shadow options.” Existing firms and entrepreneurs may explore new ventures without knowing exactly what form the new opportunity might provide. However, they are prepared to act upon it once it is revealed. Firms that actively engage in such activity build their “combinative capability” (Kogut & Zander, 1992) enabling them to create learning platforms from which to launch additional, future ventures. When done properly, the firm creates not only avenues for renewal type activities, but also an orientation to pursue them as well. At the portfolio platform level then, risk is less than for single ventures. A key insight of McGrath’s (1999) work is that even if an initial option fails it can lay the framework for subsequent successes if it has the potential to advance knowledge. Hence, success is measured by not only the actions of a single venture, but also by the portfolio of existing and future opportunities created by the venture. Decisions which create platforms of real options are more valuable than those which offer only a single opportunity.

Portfolios are not only constructed at the individual and firm level but also at a societal level. This occurs when one individual or firm launches a new venture that creates “learning platforms” (Grenadier & Weiss, 1997) for future investments by others. For any given individual, the risk of such an action can be ameliorated by support from a network or community. And as McGrath (1999) notes, by lessening the risk that accompanies failure, more options will be written. If failure is tolerated, individuals who try but fail can take the learning they have acquired and apply it to future opportunities. Even if the new venture fails, they may be able to return to previous employers or find work on other new ventures. This knowledge has value at both the individual and societal level. Thus, not only does a benefit flow to the society, but also the individual is able to capture some of that benefit as they seek new opportunities.

Caveats

Differences at the societal level between mature and emerging economies manifest themselves in how risk will be assessed. The differences in risk for firms in emerging economies can be readily observed in the level of emphasis placed in an emerging economy

on pioneering new technologies. Baird and Thomas (1985) argue that committing resources to a new venture unrelated to existing ones is perceived to be risky, especially if it entails new markets or products. In emerging economies, private firms are generally viewed as risky because they are relatively new (Ahlstrom & Bruton, 2002). This situation is heightened when it involves technology-focused firms that are even rarer. Thus, emerging economies would inherently have greater amounts of risk than mature economies. However, by drawing on the real options literature (e.g., Bowman & Hurry, 1993) a different picture begins to emerge. As we have noted above, emerging economies may be errantly described in their aggregate levels of risk.

First, renewal efforts within a given emerging economy may create a condition of information asymmetry, whereby the community possesses knowledge collectively that is unavailable to others. Societal-based options platforms exist, but may be difficult to observe, especially in nascent industries, where well-known clusters have not yet emerged. Because this information is not observable, it may appear that venturing into the unknown is more risky than it actually is. By failing to take into account the value of social capital that exists beyond the firm's boundaries, scholars may impute risk-taking behavior where it does not exist. Thus, for an emerging economy a caveat is that it is critical to capture the learning that occurs from these failed ventures, allowing it to be reabsorbed into subsequent ventures.

A second caveat that emerges is that while failure, in general, has a negative connotation, governmental regulations that discourage failure are likely to stifle innovation, reducing future opportunities (McGrath, 1997). As noted by Lee, Peng, and Barney (*in press*), entrepreneur-friendly bankruptcy laws have the potential to "generate variety by increasing the number of firms with high growth opportunities and decrease the number of failing firms both of which may be a key to value creation at the societal level." Similarly, policies and societal values which remove or reduce the stigma and other penalties associated with failure promote more business ventures to occur (Hindle & Rushworth, 2000). The difference in levels of stigma which results as a consequence of entrepreneurial failure is cited as a reason why Indian entrepreneurs are more entrepreneurial in the Silicon Valley in the United States than in Bangalore, India (Deshpande, 1998). In societies that tolerate failure the learning that occurs is valued as it is absorbed into subsequent ventures. A society may write a series of shadow options for its members, based on the individual activities of those members. While some options will expire due to a lack of money, different members of the society will exercise other options.

Equally important, individuals become more willing to venture into the unknown. This is because their opportunity costs, associated with a new venture failing, have been lessened. If failure is tolerated, individuals who try but fail can take the learning they have acquired and apply it to future opportunities. This knowledge has value at both the individual and societal level. Thus, not only does a benefit flow to the society, but also the individual is able to capture some of that benefit as they seek new opportunities. They may be able to return to previous employers or find work on other new ventures.

In addition, information asymmetry may provide a "cloak" from under which an emerging economy can spend much time exercising its options, without much notice from more mature competitors. Because the options platforms seem especially risky, competitors may choose to ignore them, or focus on what appears to be closer-in, more realistic threats. For example, when a technological breakthrough occurs, it may seem "overnight" in nature, even though it has been in the making for years. This, in turn, may lead to a temporal first-

mover advantage. Thus, for an emerging economy, an action that may appear especially risky to an outsider can create valuable options for the society as a whole.

Lastly, although the use of real options may create learning platforms (McGrath, 1999), managers may be overconfident in the learning potential regardless of what option they choose to write. Given the potential for escalation of commitment (Brockner, 1992; Staw, 1981), this is especially true with successful past performance. Thus, they may overestimate the value of learning and knowledge gained as well as overestimate their ability to select from among several potential learning platforms. In both situations, the firm's future benefits may prove to be much smaller than expected (Kahneman & Lovallo, 1993). In an emerging economy, the potential for high growth can initially create a munificent environment. But as the environment changes, two debilitating effects may emerge. First, the temptation to engage in escalation of commitment may develop as governments seek to prop up formerly prosperous companies. If the environmental change is poorly understood, or is seen as temporary, this temptation grows stronger. Second, a munificent environment may cause a temporal comfort that is unwarranted. That is, firms may think they are well-managed, when they are merely enjoying a robust economy. In an emerging economy where some industries enjoy state protection during early stages of growth, firms may underestimate the value of that protection, or prepare poorly for the eventual removal of the protection. This may put survival at stake.

As noted before, the legitimacy of all firms can be questioned in an emerging economy (Ahlstrom & Bruton, 2001). However, the ability of technology-focused firms to establish both the positive aspects of technology-focused firms and to lessen the negative impact of failure helps to increase the legitimacy of such firms and increase the ability of such activities to be pursued.

Discussion

In this paper we have addressed some of the key theoretical perspectives that are relevant to the management of knowledge such as the resource-based view of the firm, social capital/social network theory, and real options analysis. We have discussed how they have to be modified or radically changed as researchers begin to move their examination from developed markets to emerging markets. In this section, we address what we feel are promising research avenues. The theories, while still relevant, need to be adapted as they are applied in the institutional environment of emerging economies. These changes and adaptations create the need for a wide range of research issues.

Prior research on corporate renewal, or turnaround, in emerging economies has noted the importance of the networks and relationships in turnaround efforts, particularly those in Asia (i.e., Bruton et al., 2003). However, most of this research has focused on the act of replacing the CEO and its impact on the firm and its customers. Our discussion of social capital in high-technology firms, and the presentation of caveats, indicates that a broader, richer examination of social networks in the turnaround of high-technology firms may be appropriate. In this context, future research should investigate factors associated with social networks that are both internal and external to the firm and how they can impact the firm's knowledge management and its renewal efforts.

For example, knowledge management requires the active, ongoing interaction within the firm. The stress associated with renewal in a business can act to limit that interaction at a

time when such limits have a potentially strong negative impact (Bruton, Oviatt, & White, 1994). Therefore, the ability to interact and actively manage knowledge internally in a firm undergoing renewal can be particularly limited. However, for a high-technology firm the range of social networks are not only internal but also external to the firm. External social networks are particularly critical to high-technology firms in emergent markets. Li and Atuahene-Gima (2002) argue that social connections are vital facilitators of business activities in China because the possession of local knowledge and social capital is of great significance. Thus, high-technology firms in emergent markets will need to spend considerable effort managing networks that are internal and external to the firm. It would be expected that the time and effort spent managing such social networks will be considerably greater than in mature markets due to the greater role of relationships in such markets. Thus, researchers need to investigate the manner in which these internal and external networks are managed and seek to examine the differences in these network management efforts from mature markets and how these efforts impact the success of the emergent market firm.

The discussion of risk and real options suggest that if knowledge is not properly managed the negative impact on the high-technology firm can be serious. These factors appear to have a particularly important impact on renewal efforts. The connotation of lower risk taking and higher penalties for failure make the need for quick action in a renewal situation in emergent markets even more critical. The lower risk taking and higher penalties for failure will act to compress the time that a high-technology firm has to act in an emerging economy. Should the firm not act quickly, pressures in the environment may act to limit the firm so much that it will not have the same time necessary to successfully renew itself. Thus, studies of the sequential decision making processes in the real options framework would provide insights on how such firms may mitigate against taking large, and potentially irreversible, risks.

For example, a key element of any turnaround or renewal effort is high quality decision making. As noted by Atuahene-Gima and Li (2004), culturally speaking, the Chinese are seen as collectivists who construe themselves as interdependent with others, avoid conflict, and strive for harmony within a group. Clearly, the generation and maintenance of *guanxi* is salient. However, these scholars contend that organizations that are undergoing renewal must often make difficult, comprehensive decisions in which divergent perspectives are critical in ensuring the discovery and appropriate evaluation of multiple alternatives. Thus, from a general or “context free” perspective (Meyer, 2006), conflict inducing decision making processes such as dialectical inquiry and devil’s advocacy (e.g., Finkelstein & Mooney, 2003; Schweiger, Sandberg, & Rechner, 1989) would be consistent with normative theory. However, the adoption of such techniques would likely be counter to strong cultural norms in emergent economies such as China. Thus, the question for researchers would become: How can cultures that value harmony and trust attain a proper balance of active and critical debate as well as group maintenance behaviors and outcomes in the making of decisions that are strategic for the firm?

In addition to the theoretical perspectives that we have addressed, Hoskisson et al. (2000) have advocated other frameworks to gain insights into emerging economies: transaction cost theory, institutional theory, and agency theory. We concur with Wright et al. (2005) who argue that the “wholesale adoption” of theoretical and methodological approaches in emerging economies is compromised by the heterogeneity of emerging economies and firms in those economies. For example, many former centrally planned economies in Central and Eastern Europe (e.g., Hungary, Poland) have been much more

successful in implementing market-based institutions than other countries. However, other economies such as Russia and Belarus have been far less successful. Thus, the generalizability of research findings from one country to another becomes problematic. The aforementioned theoretical perspectives should provide a useful foundation to build upon this research. However, there is a need to ensure that research is conducted that consists of samples that include multiple nations. The example used in this research has been China. As the largest and most successful emerging market, it has provided useful illustrations of the caveats and potential avenues for research. However, as researchers move forward, richer samples should be employed so that the findings can be seen as relevant to all emergent markets or those emergent markets in a region like Asia and not just a single nation.

Finally, Tsui (2006) and others have addressed the relative benefits of what may be considered an “outside in” and an “inside out” approach to the study of Chinese organizational phenomena. In the former, scholars hone in on popular topics and explore how they are being manifested. In contrast, the latter requires a deep knowledge of China which is typically gained “by spending substantial amounts of time in observing and interacting with local scholars and managers, or working with collaborators who have an intimate knowledge of this context” (Tsui, p. 3). Others have advocated what might be considered a mid-range approach. Meyer 2006 (p. 120), for example, argues that “theories should be adopted to explain locally interested phenomena; or new models ought to be developed to overcome the low explanatory power of adapted theories.” Thus, in essence, let’s keep both the baby and some of the bath water! After all, research is a continual process of rediscovery and there is ample room for both deductive and inductive theory building.

In closing, we call for more theoretical development and empirical analysis directed at furthering our understanding of the knowledge management and renewal of firms in emerging economies. Clearly, such issues have important implications for practice and scholarly research. Much needs to be done if the benefits of the market system are to be fully enjoyed in emerging economies.

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