วารสารเศรษฐศาสตร์ธรรมศาสตร์ Thammasat Economic Journal
ปีที่ 27 ฉบับที่ 2 มิถุนายน 2552 Vol.27, No.2, June 2009

Firm Capability in the Corporate Governance Landscape: A Theoretical Examination and Conceptualization

Surasak Chaithanakij[*]

Abstract

Several disputes on corporate governance have been caused by overshadowing conventional wisdom, particularly agency theory, which emphasizes control, and neglects the capability and management authority dimension (CMA). Lacking the CMA dimension as an ingredient necessary for a coherent corporate governance account causes a theoretical dispute on the purpose of the firm as well as a controversy on determining if the prevailing control level suffices or overburdens. Meanwhile, a huge amount of literature on firm capability has come out but without a sufficient effort to construct a coherent theoretical framework linking these concepts. Based on organization economics, the CMA dimension of firm is established as a coherent framework, capable of serving as a major corporate governance component. An amount of literature from a few perspectives of capability is selected for review as well as for evaluation against the legitimacy of the CMA framework. The empirical studies on firm capabilities are found to rely mostly on various frameworks limiting further meta-analytic reviews and related validity evaluation. Choosing to exclusively focus on capability aspects for their own merit, most

[*] Independent researcher. MBA (U.C. Berkeley, U.S.A.), Ph.D. in Integrated Sciences (Thammasat University, Bangkok, Thailand). E-mail address: nemcon@loxinfo.co.th

studies fall short on an examination of the governance dimension though the CMA dimension as a corporate governance component remains sufficiently evidenced.

Key words: firm capability, corporate governance, authoritative capability, evolution of capability.
JEL Classifications: D24, D85, G30, L22, O32

บทคัดย่อ

แนวคิดธรรมาภิบาลบริษัทที่ผ่านมาได้ก่อให้เกิดประเด็นการโต้แย้งจำนวนมาก เนื่องจากแนวคิดพื้นฐานเหล่านี้ โดยเฉพาะทฤษฎีตัวแทนมักให้ข้อเสนอแนะไปในทางที่สนับสนุนให้มีการควบคุมผู้บริหารมากขึ้นทุกครั้งที่ปรากฏปัญหาให้ถกเถียง โดยข้อเสนอแนะทั้งหมดในแนวนี้มักมองข้ามมิติของขีดความสามารถของกิจการและอำนาจหน้าที่ของฝ่ายบริหารที่จำเป็นต้องมีเพื่อให้กิจการยังคงสามารถแสวงหาค่าเช่าทางเศรษฐกิจอันเป็นวัตถุประสงค์พื้นฐานประการหนึ่งของกิจการ การขาดมิติเหล่านี้ในกรอบคิดธรรมาภิบาลบริษัทได้ก่อให้เกิดความสับสนในเชิงทฤษฎี โดยเฉพาะในสิ่งที่เป็นวัตถุประสงค์ของกิจการตลอดจนระดับความเหมาะสมของการควบคุมฝ่ายบริหาร ในขณะเดียวกัน แม้จะมีนักวิชาการจำนวนมากได้ผลิตผลงานการศึกษาในประเด็นขีดความสามารถออกมา แต่ยังคงไม่มีใครสามารถประมวลผลการศึกษาเหล่านี้ให้อยู่ในแนวทฤษฎีเดียวกัน บทความนี้ได้อาศัยแนวคิดเศรษฐศาสตร์องค์กรเพื่อสร้างแนวคิดใหม่ที่ประสานขีดความสามารถและอำนาจหน้าที่ของฝ่ายบริหารเข้าด้วยกัน โดยเสนอให้ทั้งสองรวมกันเป็นองค์ประกอบที่สำคัญประการหนึ่งของธรรมาภิบาลบริษัท และพร้อมกันนั้นก็ได้ใช้ผลการศึกษาเชิงประจักษ์จำนวนหนึ่งเข้าเปรียบเทียบเพื่อประเมินความน่าเชื่อถือ แม้ความพยายามดังกล่าวจะประสบปัญหาเนื่องจากการศึกษาในเรื่องขีดความสามารถที่ผ่านมามักใช้กรอบการศึกษาที่หลากหลาย แต่หลักฐานที่ปรากฏก็มากพอที่จะยืนยันความเป็นไปได้ของแนวทางการประสานขีดความสามารถและอำนาจหน้าที่ของฝ่ายบริหารรวมกันเป็นองค์ประกอบสำคัญประการหนึ่งของระบบธรรมาภิบาลบริษัท แม้จะยังไม่เคยปรากฏความพยายามในลักษณะเช่นนี้มาก่อนก็ตาม

1. Introduction

One major purpose of the firm is to seek rent (Zingales, 1998). Without due capability, firms may miserably fail to fulfill the purpose, where firm capability is defined as 'the bundle of complementary resources, administrative skill, routines, and physical assets with the flexibility to generate adaptive and valuable outputs' (Miller, 2003, p. 964). The lack of clear purpose and boundaries of corporate governance always causes a controversy whenever there is a call for an improvement of legal protection in response to any corporate scandal or regional financial crisis. An improvement of legal protection always causes a fear of having negative effects on firm capability for seeking rent. The dilemma can be distinguished even in the advanced economies like the U.S. (Holmström and Kaplan, 2003), which is believed to have good corporate governance (Gilson, 2000) and leadership in shareholder protection (La Porta et al., 2000). The scandals of Enron, Worldcom and other led to the enacting of the Sarbanes-Oxley Act (SOX) by the Congress which has caused much concern and suspicion that the act would not help to prevent the next similar case to Enron, and the concern that instead it has started hurting the U.S. capital market. The arguments about the effect of SOX from the two opposite sides have been going on (Romano, 2005; Leon, 2006; Anand, 2005; Felton and Fritz, 2005; Cheng and Wu, 2006). The more controversies appear, the clearer the lack of a solid and applicable theoretical framework of corporate governance and the related function of firm capability and management authority becomes.

The ambiguity in the economic perspective of firm capability and management authority has created a gap between the economic and by-law duty of agents. While the economic duty calls for the affirmative fiduciary duty[1] – for what is accounted for as acting in good faith, the duty under legal practice can at best deliver only the negative fiduciary duty – avoiding the

[1] 'Affirmative fiduciary duty' and 'negative fiduciary duty' are newly coined terms by the author. They are specifically used to distinguish between two deep meanings of the fiduciary duty – firstly, that which it is expected will be done and secondly that which it is expected will not be done. (p.3)

subject of what is accounted for in acting in bad faith. Courts normally have to render judgments based on legal grounds, which unfortunately are not aligned to the major economic purposes of the firm which are to create and utilize capabilities for seeking and distributing rent (March, 1991; Luo, 2000; Chaithanakij, 2006a). The court's verdicts undoubtedly become norms for agents. Since the negative fiduciary duty only calls for the agents to act with care and loyalty, the agent has a license to fail in the economic sense to a large extent. The hidden illogicality seems to have caught the attention of some corporate law scholars, including Eisenberg (1999)[2] and Nowicki (2006), though their issues may not be specifically related to what the resource-based theory of firm might supposedly have articulated as the purpose of the firm. This paper attempts to argue that the agents have a wider scope of fiduciary responsibility than acting with care and loyalty. Instead, the main purpose of agents has to lie in a major component of corporate governance, called authoritative capability, which is to ensure that the effectiveness and efficiency of the firm's capability development and deployment for rent seeking and distribution[3] are accomplished. Agents are allowed to exercise the authority embedded in the organizational hierarchy for that purpose. The authoritative capability becomes the necessary foundation for evaluating agents - firm management and the board of directors.

The last few years have brought a lot of new insights into capability and innovation studies, resulting in a great richness and heterogeneity of concepts, theoretical approaches, and empirical results. Innovation is defined as the utmost class of capability by applying existing knowledge to create a new knowledge (Drucker, 1993). However, there have been very few efforts to construct a coherent theoretical framework of capability that finds its linkage to

---

[2] In his review of fiduciary law of the U.S., Eisenberg indicates that the meanings of act or omissions that are 'not in good faith,' or which involve 'intentional misconduct' will have to be developed by judicial interpretation. The law generally concerns only liability, not the validity of the directorial action (1999, p. 1267). (p. 3)

[3] Firms use rent distribution as an incentive to motivate the cooperation of all agents involved (Baker, Gibbs, and Hölmstron, 1993). Executive compensation is one aspect of rent distribution that deserves a whole separate analysis, which unfortunately cannot be covered in this article due to limited space. (p.4)

corporate governance (Langlois and Foss, 1997; Carney, and Gedajlovic, 2001). With existing evidences, this article finally proposes that authoritative capability is one of the major corporate governance components[4], which has been underlying studies on the theories of the firm for decades (Foss, 1999: Love, 2005). The main function of authoritative capability is involved with exercising authority embedded in the firm's hierarchical structure to seek economic rent.

This paper begins by establishing the connection between hierarchy, authority, capability, innovation, leadership and ownership structure under the same corporate governance component of authoritative capability. A sizable number of recent studies on firm capability and innovation then are reviewed for their validity and advancement, and then they are evaluated against the proposed authoritative capability. Special attention is paid to the governance aspects of capability, which would hopefully substantiate the intertwining of authoritative capability with corporate governance. The rest of this article is arranged as follows. Section 2 relies on organizational economics and institutional economics to establish authoritative capability as a corporate governance component. The coexisting nature of firm authority and capability is elaborated. The hierarchy of the firm serves as the tangible core for authority to be exercised so that economic rent can be generated. The alignment of firm authority comes in several forms: CEO duality, managerial ownership and concentrated ownership. All forms of authoritative alignments create concentrated authority in the firm and support a unified leadership. Such authoritative alignments may be considered a class of firm capability. Different assumptions of two main theories of the firm are also discussed. The four following sections shed light on previous studies of the firm capability concept and its progress. The content of Section 3 explores the recently developed concepts and empirical studies on firm capability and its utmost class, innovation. The studies of both knowledge-based and resource-based capabilities are reviewed in this section. This article allocates the review of authority-based capability to Section 4. Section 5 focuses on the studies of

[4] This was earlier proposed in the Trimiti theory of corporate governance, along with the other two components, which are Control power and Cultural consensus. The theory along with its three components was tested with satisfactory results (Chaithanakij, 2006a, 2006b, 2006c). (p.4)

governance of capability and innovation. This article ends with Section 6, in which key points are briefed and new insights are indicated.

2. Hierarchical Structure as the Authoritative Capability of Firms

The core theoretical concept of authoritative capability takes a very similar approach to the earlier effort that places production center-stage in the explanation of corporate governance (Langlois and Foss, 1997). In addition to the previous proposition, the authoritative capability concept of this paper conjectures that the 'capability' of the firm may not be developed or be properly utilized without the exercise of authority embedded to firm hierarchy and bounded by its purpose. The firm's capability is meaningless unless considered in conjunction with authority and purposes. The authoritative capability concept also takes the stance of the interchangeability between capability and authority, at least to a certain degree or in certain circumstances.

2a. Theoretical Proposition of Authoritative Capability

All organization exists to serve purposes (North, 1990). Without sufficient capability and proper deployment of the capability (March, 1991; Luo, 2000), firms may fail to fulfill their very purposes of which are to seek and distribute quasi-rent (Zingales, 1998). Over time, a firm creates its capability by having innovation (Schumpeter, 1934; Penrose, 1959), focusing on a narrow range of tasks, thus deriving efficiency from economies of scale and ensuring comparatively low transaction costs to the market (Demsetz, 1997, pp. 8-11), and by maintaining an efficient governance structure (Coase, 1937, Williamson, 1984; Klien and Lien, 2003) to minimize transaction costs (Williamson, 1985; Foss and Foss, 2005), and agency cost (Jensen and Mekling, 1976).

The hierarchy of the firm can keep all resources focused on the task. That is how the hierarchy creates capability and innovation. The additional layer of hierarchy is needed to effectively coordinate internal, different specializations of tasks unfulfilled by other firms (Inderst et al., 2005). Authority embedded in its hierarchical structure allows the firm to create sufficient

capability to deal with business uncertainty (Knight, 1921; Teece, Rumelt, Dosi, and Winter, 1994, p. 205), accumulate knowledge (Penrose, 1959; Levitt and March, 1988; Mahnke, 2001), identify the problems, then seek the solutions (Nickerson and Zenger, 2004), recognize the value of new, external information, assimilate it, and apply it to the commercial end (Cohen and Leventhal, 1989), keep being exposed to new ideas (Fagiolo and Dosi, 2003), overcome the lock-in problems of their technological trajectory and other organizational constraints (Leydesdorff, 2000; Banerjee, 2003), be ready for interacting with markets to create value (Moran and Ghoshal, 1999), and invest for the long-term opportunity (Buchanan, 1994).

The interaction between the vertical integration and specialization of the firm is well noticed (Arora and Bokhari, 2000; Jacobides and Winter, 2005) and the vertical scope and firm boundary are under internal as well as external influences (Jacobides and Hitt, 2005; Jacobides and Billinger, 2005). Firm authority is exercised to coordinate external capabilities, well beyond the internal ones, making firm authority a class of firm capability and vice versa. History has provided us with convincing evidences of the hierarchical advantage. One of the keys to Roman success was their organizational ability to produce and distribute fertilizer. It was a capacity that enables the empire to finally conquer Europe (Geu, 1998; Bernard, Redding and Schott, 2006). The capability residing in hierarchical layers however do not come without cost. These layers have impeded the information flows and quickness of response necessary for flexibility and innovation (Nohria 1996). To a certain number of layers, the costs may surpass the advantage. Therefore this paper proposes that hierarchy is where the 'authoritative capability' of firm resides to carry out tasks. Other empirical evidences in the following sections is found to support the framework of 'authoritative capability'.

2b. Authoritative Alignment as Firm Capability

When authoritative alignments are allowed, such as concentrated ownership in most family firms and CEO duality in public companies, firm authority becomes concentrated and all functions of all lower hierarchical layers come under the direct influence of the top manager. As a hierarchy brings in authority with specific purpose in carrying out certain tasks with lower

influence costs (Knight, 1921; Inderst et al., 2005), the concentrated authority provides firms with the special maneuvering capability of decisive decision making (Langlois, 1998; Carney, 2005), and more flexibility (Nikerson and Zenger, 2004) to pursue a wider scope of business strategies (Brown and Eisenhardt, 1998) and take a benefit from a brief window of value creation. The concentrated authority helps in overcoming the adaptive obstacles of hierarchy caused by the incentive conflict (Williamson, 1991) as well as overruling the decisions of employees under bounded rationality (Simon, 1945). It also protects the property rights of the firm from opportunistic captures by vendors, employees or outside shareholders (Foss and Foss, 2005) and provides firms with clear-cut leadership and low information costs; the negative effect is agency cost. Therefore, firms with concentrated authority are expected to be advantageous in low munificence, high complexity, and high dynamic environments (Boyd, 1995).

Based on the definition given by Miller (2003), the higher flexibility in mobilizing the resources to accomplish objectives constitutes a critical element of firm success and that makes all forms of authoritative alignments fall into a capability category. Section 4 discusses the disputes on the related empirical evidences.

2c. Different Assumptions of Concepts

Authoritative capability as a corporate governance component takes in both knowledge and efficiency-based capability as the firm's fundamental instruments to seek rent. This poses the problem of incompatible assumptions because the game-theoretic models used in most theoretical researches on the opportunism-based theory of the firm focus on transaction cost economizing and have no room for the process aspects introduced by bounded rationality (Foss and Klein, 2005, pp. 6-7). That definitely implies that the foundation of other fuzzy models, particularly the knowledge-based theories (Winter, 1988; Langlois, 1992; Dosi and Marengo, 1994; Teece and Pisano, 1994) would find difficulty integrating with other efficiency-based theories (Williamson, 1984, 1985; Demsetz, 1997). Since both theories of the firms, and most capability concepts, particularly the efficiency-based but also the knowledge-based, tend to share similar sets of assumptions, a similar dispute inevitably prevails with the capability concepts. It should be noted

that though this dispute may not support the integration of the two concepts, it however does not undermine the validity of either kind.

Based on the research evidences in Section 3, there likely exists a relation between knowledge and its efficiency-created routines. The concepts of knowledge-based capability seem to fit in the early stage of the capability life cycle from exploration of capability to its exploitation (March, 1991) whereas the concepts of opportunism-based or efficiency-based capability fall into the latter stage where their routines and borders are much in place. Their linkages to the capability life cycle are compatible with the paradigm development concept (Kuhn, 1996). Efficiency-based capability can be compared to the discipline of a more developed paradigm, which has greater structure and predictability (Lodahl and Gordon, 1972) and fewer debates over legitimate methods, problems, and standard of solution (Kuhn, 1996, p. 48). In business worlds that are novel and complex (Gavetti, Levinthal and Rivkin, 2005), it does take time and effort to transform new knowledge into a truly profit-generating capability. Once knowledge is transformed into a full fledged product and the merit of a capability has been established, its control-related systems are imposed to ensure its reliability and highest efficiency, and that the least opportunism is involved. Then the efficiency-based capability becomes apparent.

Both capability concepts do not invalidate each other and a firm can have more than one class of capability. Coupled with their possible linkage through different stages of life cycle, the incorporation of both concepts in authoritative capability can be accepted. Section 2 has established the framework of firm capability for further reviewing the studies involved.

3. Firm Capability

3a. Forms of Firm Capability

Firm capabilities come in different forms. At least five categories of capability studies have been recognized in the last decade. They are position-based, efficiency-based, knowledge-based, resource-based, and authority-based capability. The old school of thought (Bain, 1959; Porter, 1980, 1985) tends to see the entry barriers, relative bargaining power of actors, cost

differentials, and the subsequent continuity of imperfect market condition as the dependable sources of firm capability, conforming with the tradition of neoclassic economics. Following that school of thought, firms may seek rent through their position-based capability by making costly commitments, diminishing the motivation of potential competitors to do the same (Porter, 1985; Saloner, Shepard, and Podolny, 2001). The efficiency-based capability (Williamson, 1984, 1985; Foss and Foss, 2005) can also be categorized as a type of position-based capability. Though the aspect of market structure remains meaningful in certain industries and economies, especially in developing countries, it has substantially lost its importance, at least among firm managers, in light of advanced information and communication technology and globalization. If there are any studies in that aspect recently, they tend to be oriented to the social welfare front (e.g. Martin, 1996). As the searches for more reliable business strengths continue, the innovation-based or dynamic capability has recently gained more momentum (Teece and Pisano 1994; Teece, Pisano, and Shuen, 2000). Meanwhile, a similar pattern simultaneously takes place in business firms, where organizational capability rather than served market has becoming the primary basis for firms to establish their long-term strategies (Grant, 1996, p. 375). It is likely that the competitive advantage based on such a demand-sided capacity is much more vulnerable to business risk caused by globalization and informational technology-based competition (Mikkola, 2001). Firms can rely less on their marketing competitive edge and instead turn to innovation. Innovation, which is referred to as the discovery of technology leading to a major change in design, product quality, or production process, is the advanced capability of a firm.

Innovation just has been recently accepted to be a more reliable source of competitive advantage for firms (Wolfe, 1994; Damanpour, 1996) and knowledge is believed to be the key building block of innovation and the subsequent evolutionary process of the industrial sector (Malerba, 2006, p. 12). Empirical studies supporting the hypothesis of capability-dependent performance keep coming out but the effort to substantiate the claim of capability-based performance has never been easy. Due to its recent loss of importance at least in academic circles,

the studies of capability in position-based view are sparse and fall out of this survey. There are three classes of capability studies remaining for review.

(1) The Knowledge-based Capability

The change in research patterns on knowledge from general to more specific studies has been recognized in recent years, at least in more advanced economies. Some of the general researches remain important and deserve attention regardless. The firm's specificity has been found to move from tangible assets to human capital (Rajan and Zingales, 2000). The results of later studies tend to support the argument: the flattening of business organizations in the U.S. (Rajan and Wulf, 2003), the increasing employment of expert scientists in several disciplines, the creation of network alliances between different actors found in the pharmaceutical industry (Lacetera, 2001, p. 31), and the accumulation of industry specific human capital robust to institutional and economic differences across sectors and countries (Rossi-Hansberg and Wright, 2005). Different impacts of human capital accumulation on firms and business sectors and countries are observed. Industrial sectors and technologies are found to differ greatly in term of knowledge bases and learning processes related to innovation. In some sectors, science is the force driving knowledge growth, while in others, learning by doing and cumulativeness of advancement are the major forces (Cowan et al., 2000).

While the capability development in advanced countries tends to be concerned with seeking the specific processes and procedures of capability creation, capability development in less developed countries (LDCs) appears to be lagging behind. They remain primarily more concerned with motivation and technological absorption. In a recent study, Foreign Direct Investment (FDI) was found to not always lead to technology transfer to firms in LDCs as previously believed. Lenger and Taymaz (2006) studied innovation and technology transfer activities of domestic and foreign firms in Turkish manufacturing industries. Horizontal spillovers from foreign firms appear to be insignificant. High-tech suppliers tend to have a high rate of innovation when the share of foreign users is high, but the opposite is true for users: high-tech users supplied mainly by foreign firms tend to have a lower rate of innovation. The finding is

compatible with an earlier study, which indicates that the active learning of South Korea is found to have contributed to her superior technological absorption and subsequent industrial advancement over Brazil, which has a passive learning system (Viotti, 2002). These lessons indicate that LDCs cannot hope that a mere open policy for high-tech FDI may lead to domestic technological development by itself.

The global production networks are reported to continuously play a major role in directly and indirectly transferring knowledge around the globe. To fully reap the benefit, local firms have to actively upgrade their technological absorptive capability (Ernst and Kim, 2002; Ahrens, 2002). Likewise, research on innovation activity related to the development of the offshore wind turbine industry in Denmark suggests that the most successful form of innovation does not depend on the type of innovation in terms of systematic or modular innovation. The characteristics of the industry, combined with the strategy or approach pursued by the innovative firms, also play a role in appropriability conditions (Andersen, 2005). Meanwhile, domestic ownership structure has been found to be more important than foreign capital in explaining the effect of innovation on organizational performance in Taiwan (Kuo and Wu, 2007). All these are compatible with the research result of Lokshin, Belderbos and Carree (2006) who find complementarity between internal and external R&D of Netherlands' firms, with a positive impact of external R&D in cases of sufficient internal R&D.

Though certain aspects of general knowledge, especially in LDCs, may still be needed, a fundamental understanding of the firm's knowledge, mostly in advanced countries, has been accumulated to the point that study from the broad identification of the main characteristics and effects of knowledge across sectors to a detailed specific type and structure of knowledge, study of its various effects on innovation and the organization of innovation activities, and study on the two-way relationship between knowledge evolution and industry evolution in different sectors (Malerba, 2006, p. 13) is merited. Finding the linkage between one specific dimension of knowledge and the organization of knowledge production, and finding the linkage between the

learning and knowledge environment to the innovative activities in a sector are two of the various ways to study the effect of knowledge on innovative activities (Arora et al., 2001).

Studies on specific products, technology and industry have started mounting up. In a search for the pattern of new inventing methods in biotechnology and nanotechnology in the U.S., Rothaermel and Thursby (2006) empirically test them and conjecture that the adaptation of incumbent firms to new methods of inventing follow similar patterns of initially accessing tacit knowledge on how to employ the new methods and then codifying the knowledge into routine procedures or commercially available equipment in later stages. This implies that the evolution of both technologies began in human capital before becoming the capability of the incumbent firms. The refocus toward specific researches is probably more observed in the resource-based view (RBV), unfortunately with limited success as shown in the following section.

(2) The Resource-based Capability

Several research frameworks have been developed and tested in accordance with the RBV (Penrose, 1959). The studies under RBV tend to include knowledge, alienable assets, and work process all together in their frameworks either as the main explanatory or mediating variables. In addition to the main proxies for capability measurement, most of the studies have included a range of different mediating variables, including strategy (Low and Cheng, 2006), social capital (Zaheer and Bell, 2005), a unique portfolio of market-oriented resources (Yiu, Bruton, and Yuan, 2005), learning and timing (Zott, 2005), and knowledge management (Ravinchandran and Lertwongsatien, 2005) in their models. Similarly, Ethiraj et al. (2005) use project-level data from firms in the global software service industry for their study and find that client-specific knowledge and project management are two main significant capabilities. Meanwhile, Cho and Pucik (2005) create structural equation models to examine the relationships between innovativeness, quality, growth, and firm performance. They find that innovativeness mediates the relationship between quality and growth; quality mediates the relationship between innovativeness and profitability; both innovativeness and quality have mediation effects on market value; and both growth and profitability have mediation effects on market value. The test

results probably explain why several studies have failed to find a direct relationship between innovativeness and firm performance. Based on a review of ten papers that study various aspects of innovation and knowledge management, Hall and Mairesse (2006) conclude that each group of researchers tends to choose different frameworks and data types for analyzing research questions preventing the comparability of research findings. The point that Hall and Mairesse have raised in their survey well characterizes the contemporary pattern of studies that capability scholars are facing.

Most studies under RBV rely on Bayesian statistical techniques intended to find the relationships between certain aspects of capabilities with performance indices. The lack of the strong support of capability-dependent-performance theory has substantially compromised their research findings (Rozeboom, 1960; Rosekrans, 1969; Powell, 2001, 2002). The inclusion of those complementary variables also makes a meta-analysis of firm capability nearly impossible (Good an Hardin, 2003, p. 87). Adding more explanatory variables, though helping in explaining the findings of each study, opens more opportunities for those studies to slip into the mode of self-fulfilling prophecies. By trying out a range of complementary variables, most of the models may eventually find significant associations. It can equally be argued that the capability proxies serve as just mediating or supportive factors (e.g. Cho and Pucik, 2005). Though the statistical techniques may resolve this problem, it usually requires that researchers use a larger set of samples and put in more effort. Some studies may not be readily able or bothered to cope with the increased requirements.

Faced with this looming threat, some researchers choose to use alternative frameworks, which easily lead them back to the previous dilemma. The stochastic-frontier-efficiency methodology (Dutta, Narasimhan and Rajiv, 2005) may represent an example of this. In this study, increased heterogeneity in R&D is used as a proxy for studying firm capability and a persistence in heterogeneity in R&D capability across U.S. semiconductor and computer firms over time is subsequently found. This is compatible with a similar study done earlier in Spain, which indicates that market tends to reward high R&D capability firms, represented by the highest average values

of Tobin's *Q* and compatible with earlier research. The positive relationship between the market value and accounting performance of Spanish firms and their technological levels supports the notion that superior technology leads to better performance (Cañibano et al., 2000). By using different frameworks and substituting values of Tobin's *Q* for earning figures, the researchers may resolve statistical dilemmas, but may find themselves lacking the theoretical support for the relationship between R&D capabilities and firm value. The empirical studies on RBV are found to still fall far from supporting a conclusive core concept of firm capability.

It also should be noted that these studies tend to exclude corporate governance or other unfavorably influential variables from analysis even if the variables deserve no less consideration than those mediating variables. This phenomenon probably makes Powell (2001) reluctant to accept the studies that take for granted the capability effects on firm performance. He argues that there have been some factors left out of consideration in those studies. Powell calls the factors 'competitive disadvantages'.

Though the internal and external organization of knowledge production and capability creation are critical for understanding the evolution of firm capability and industry, we may not ignore the underlying factors: what takes and holds them together, what causes them to evolve in different directions, and how they prevent and keep down the costs of holding-up associated with their knowledge-creation partnerships? The studies that take the competitive disadvantages into equations may help to answer the questions to a certain extent, but not all of them. The answers to these questions are believed to lie in the governance of the capability development system. This paper takes this opportunity to expand the scope of review in an attempt to gain more understanding of the governance systems of capability, which is the main objective of Section 5.

4. The Authority-based Capability

The effects of authority-based capability are mostly found in the studies of corporate governance focusing on family firms and CEO duality, both situations which are expected to undermine the monitoring function of the board of directors and cause agency cost to rise.

However, several of these studies turn out to have given opposite results. Performance has been often used as a proxy to measure their effects on firms. There are a few that focus on the nature of relationship between firm authority and capability. Brusoni (2003) studied the engineering design activities of British chemical firms. The researcher finds that authoritative communication of firms extends beyond the area of internal administrative coordination. Firms can maintain wide scientific and technological capabilities that enable them to co-ordinate loosely coupled networks of specialized suppliers and increase the outsourcing of activities previously performed in house. This study indicates that the authority may substitute internal capability to a certain extent, supporting the concept of authoritative capability. Meanwhile, a recent empirical study indicates that business requirements increasingly put pressure on U.S. firm flexibility. Increasingly, sophisticated customers require a mass customization strategy which requires firms to supply a rich variety of products with different volumes, good quality and low costs (Zhang, Vonderambse, and Lim, 2003).

4a. The Ownership Structure as Firm Capability

Two remarkable meta-analytic reviews conclude a strong support for concentrated ownership as a necessary condition for business success. The good corporate governance systems are found to be rooted in an appropriate combination of legal protection of investors and some form of concentrated ownership (Shleifer and Vishny, 1997). Only ownership concentration seems able to overcome the problem of weak legal protection in countries with weak investor protection (Denis and McConnel, 2003). The managerial flexibility supported by concentrated ownership is also found in a recent empirical study, which shows that privately held small firms that pursue efficiency strategies or flexibility strategies outperform those that attempt both while no significant performance differences are found between firms utilizing either efficiency strategies or flexibility strategies (Ebben and Johnson, 2005). Meanwhile, a recent empirical study by Gulati, Lawrence, and Puranam (2005) shows that concentrated ownership is found to help not only in controlling hazards of renegotiation in procurement relationships but also in their capacity to generate coordinated responses to adaptive pressures in the tasks and transaction

environment resulting in performance differences. For all business transactions that require special care or personal commitment, family firms tends to receive more trust to honor their promises (Bertrand and Schoar, 2006), where family firms are defined as those businesses that have some identifiable share of ownership by at least one of the family members and that have multiple generations in leadership positions within the firms (Zahra, Hayton, and Salvato, 2003).

Besides the firm flexibility associated with concentrated ownership, there also are other perspectives of empirical studies supporting concentrated ownership as a determinant for capability. Hill and Snell (1988) found a significant, positive correlation between stock concentration and R&D intensity whereas Hansen and Hill (1991) found a mild positive correlation between institutional stock concentration and R&D spending. As a significant negative relationship of R&D intensity of firms in the U.S. and ESOP (Executive Stock Option Program) concentration was found, Gamble (2000) concludes that mangers of companies with dispersed ownership tend to commit the firms to low business-risk strategies rather than to maximizing financial and market performance.

However, the flexibility does not come without a price to the firms as well as to social well-being. Perlow, Ohkuysen, and Repenning (2002) find that fast decision making may lead firms into a "speed trap" that is detrimental to firm performance eventually. The finding is confirmed by a recent study, in which internet startups were found to make faster decisions when they were managed by those having experience of entrepreneurship. However, they also bore the higher risk of closure (Forbes, 2005). The association of concentrated ownership with expropriation is found in several studies. The expropriation associated with controlling managerial ownership may be apparent (Claessens et al., 2002; Sundaramurthy, Rhoades, and Rechner, 2005; Bartholomeusz and Tanewski, 2006; Chaithanakij, 2006a). Authoritative capability associated with absolute management power seems involved with risk and possible negative effect on firms. However, the causes of expropriation are much less clear.

Meanwhile, Baron (2006) has created a model of the firm to show that higher-ability managers can have both higher operating profits and higher social expenditures in the good years

and may turn to taking advantage of stakeholders in bad years. The test results are much in line with earlier empirical studies showing that firm capability can be used in profit seeking as well as in committing harmful acts to society through political rent-seeking (Baumol, 1990; Morck and Yeung, 2003; Wu, 2005; Imai, 2006; Bertrand and Schoar, 2006, p. 81).

Ascribing all these negative effects on the firm and society at large to concentrated ownership has often been witnessed. However, this may not invalidate an alternative view that the negative effects may be attributed to insufficient and inadequate compensating control rather than to the inherent influence of concentrated authority. Ascriptions of all the negative effects to concentrated authority may constitute a gross simplification. Though the disputes on the poor performance of firms associated with concentrated ownership remain, the effect of expropriation may have commingled with the beneficial contribution of concentrated ownership making it difficult to make an unambiguous conclusion on its relationship with firm performance (Bertrand and Schoar, 2006, p. 81). In his meta-analytic review, Shea (2006) concludes that the influence of the family firm on its governance and performance remains controversial because there is not a robust theory that can explain the multifaceted attributes of family firms across different institutional and cultural settings. Maybe we do not need such a complex model because a recent research with a much simplified model indicates that family-controlled firms are found to have better performance only in countries that have stronger shareholder protection (Peng and Jiang, 2006). This is much in line with Trimiti corporate governance theory, which argues for the simultaneous consideration of all internal and external powers involved in firm decision making (Chaithanakij, 2006a, 2006b, 2006c). However, we still need more evidences to reach an unambiguous conclusion.

4b. The CEO Duality as Firm Capability

Similar to the case of concentrated ownership, a few of meta-analyses on the effect of CEO duality end up with inconclusive conclusions in cases where publicly traded firms with CEO duality underperform firms with separate positions (Dalton, Daily, Ellstrand, and Johnson, 1998; Dahya and Travlos, 2000). Recent studies also show similar results (e.g. Dedman, 2003; Faleye,

2003; Carapeto, Lasfer and Machera, 2005; Linck, Netter, and Yang, 2007, p. 23). In contrast, there is an accumulation of evidences indicating that CEO duality or CEO ownership has a positive effect on performance under certain industry conditions and a negative effect under other industry conditions (e.g. Finkelstein and D'Aveni, 1994; Boyd, 1995; Griffith, Fogelberg, and Weeks, 2002; Faleye, 2003; Brockman et al., 2004).

The relation and partly substitutability between knowledge-based and resource-based capability are distinguished. The similar effects of CEO duality and concentrated ownership with certain superior capacities, which help firms to outperform in certain conditions, are also noticed. Under Trimiti theory, the conditions, in addition to firm environments, are claimed to include the sufficient compensating control power, which makes for the continuous balance of power (Chaithanakij, 2006a).

Williamson (2000) claims that firm hierarchy exist to limit opportunism. Concepts accompanied by evidences in this section however tend to support the argument that hierarchy in firm is needed for strengthening firm capability than restraining opportunism. It is more likely that authority associated with hierarchy simply allows a transfer of opportunism from lower levels to higher managerial levels. In other words, some opportunistic activities tend to go hand in hand with authority. Hierarchy and internal market help limit some opportunistic activities at its lower layers, but also the hierarchy transfers some to higher layers. To a certain point the cost of operating and maintaining a hierarchy – coordination, monitor, efficiency loss due to organization inflexibility, and opportunism at higher levels – surpass its rent generating capacity. This partly explains why there are an optimal number of hierarchical layers that is most efficient for a firm. Most research findings in this section tend to support the concept of authoritative capability. However accompanied opportunism-restrained mechanism is needed if firm intends to obtain any net positive effect from the authoritative capability.

5. Empirical Studies on Governance of Capability and Innovation

Research in strategic management has a long history of using the RBV to explain differential firm performance (Peteraf, 1993; Barney, 2001). Though there are evidences to support the argument that there is something unfavorably affecting firm profitability and it is tempting to ascribe a firm's eroded competitive advantage to such phenomena, the evidences are too ambiguous to draw such a conclusion. Whereas there have been enormous studies on firm capability, the concept of advantage-dependent performance is taken for granted regardless of its ambiguous effects (Powell, 2001, 2002). Resource-based propositions, including firm capability, are analytic or pragmatic at best, no matter what their microeconomic and sociological foundations (2001, p. 882). The empirical evidences of the effects of unambiguous advantages like low costs, product quality, location, or firm size on firm performance still lag behind their theoretical counterparts (Powell, Lovallo, and Caringal, 2006, p. 175). Powell (2001) proposes that future researches include the consideration of competitive disadvantage if we are going to make any sense out of our studies on firm performance as well as capability.

Most studies on capability do not specify what constitutes those disadvantages in just the same way that most of the conventional studies on corporate governance mechanisms, particularly ones based on agency theory (Jensen and Meckling, 1976; Johnson, Daily, Ellstrand, 1996, p. 433; Heracleous, 2001, p. 165), tend to ignore the contribution of firm capability to superior performance. The incompatible theoretical foundations may be an obstacle (e.g. shown in Foss and Klien, 2005), no less than their separately existing paradigms (Powell, 2001, p. 885). A bridge between firm capability and its competitive disadvantages is seriously needed. Trimiti theory of corporate governance represents one among few efforts to couple the firm capability issues with its preventive mechanisms for possible risks – mismanagement as well as opportunism (Chaithanakij, 2006a, 2006b).

One major aspect of capability studies is intended to find the internal and external governance systems of capability and innovation, which profoundly vary across firms, business sectors, industries and economies. A previous study concludes that innovative activities in

industries are likely shaped by several institutions - some of them national, others sectoral, including standards, regulations, norms, routines, common habits, established practices, rules, etc (Edquist, 1997). However, the explanation for industry-level can hardly substitute for the firm-level (Ostrom, 2005, p. 12). Thus if we want to understand more about the governance system of innovation, a closer scrutiny into the subsystems is obviously needed.

Firm governance becomes involved with its capability in at least in two aspects: first as a direct mechanism for supporting firm capability development and deployment, and second as an indirect mechanism for nurturing human capital. As the firm's specificity has moved from assets to human capital (Rajan and Wulf, 2003), it has become more realized that firms need to instill the image of trustworthiness among employees (Shapira, 2000). Having corporate governance seems inevitable if firms intend to have this trustworthiness (Blair and Stout, 2001; Osterloh and Frey, 2004). In all trust-based business like insurance and health care, corporate governance is thus a critical intangible capability of firms. Based on a study of new innovation processes in the pharmaceutical industry in the U.S., Lacetera (2001) hypothesizes that there is a certain governance system supporting the innovation process.

The empirical studies do not seem to have found the single optimal system for innovation across firms (Baron and Hannan, 2002) but they have witnessed a number of particular supporting factors for innovation including strategic alignment, resource integration, quality culture, and compatible financing (Irani, Beskese, and Love, 2004; Carpenter, Lazonick and O'Sullivan, 2003; O'Connor and McDermott, 2004). Each study indicates each specific complexity of the governance aspect of firm capability.

There are some circumstances, however, in which patterns are recognized. Argyres and Lieabeskind (2002) call the condition 'governance inseparability', which is found to dominate the characteristics of the biotechnology industry in the U.S. where the potential R&D projects are undertaken by small new entrants, rather than by large firms. While studying Chinese firm capability, Guan and Ma (2003) found a significant, positive relationship between six capability dimensions (including learning, R&D, marketing, organization, resource exploitation, and

strategic capability but with the exception of manufacturing capability) and export ratios of Chinese firms. The group of supplementary innovation assets[5] has a much more positive influence on export ratio than the core innovation ratio for the firms under study. A few more similar studies in different contexts are probably required before any conceptual frameworks can hold their ground. Meanwhile, there have been a few attempts to understand the driving forces underlying the R&D patterns. The study of Intel's capability evolution indicates that a form of internal market mechanism is needed to ward off a possible strategic trap (Burgelman, 2003). Rognes (2002) qualitatively investigated R&D activities of multinational companies with several production sites and markets, focusing on the tension caused by two contrast directions of contracting and dispersing forces in shaping the geographical structure of their R&D activities. In his study, the dispersing forces are more prevalent at strategic levels, while the contracting forces are more pronounced at the operational levels.

With a limited number of evidences, these research results may highlight the complexity of capability governance. They tend to show the influence of capability heterogeneity and high power incentive power underlying the industry structure in well developed market economies in contrast to the importance of absorptive capability in less developed market economies in shaping the governance structure of firm capability. A study of Rognes (2002) may represent a governance system, which keeps the balance of the required strategic capability on one end and the need for efficiency control on the other, in a way that is compatible with Trimiti corporate governance theory (Chaithanakij, 2006a, 2006b).

(2) Role of the Board

Unproductive R&D can often be witnessed in many U.S. firms (Jensen, 1993). Some spending may be intended for short-term reputation building to enhance managers' visibility in job market (Hirschleifer, 1993). Though boards of directors are reasonably expected to play an

[5] Guan and Ma (2003) divide firm assets into 'core innovation assets', which enable firms to translate innovation concepts through R&D, manufacturing, and marketing process, and 'supplementary innovation assets', which in turn enables them to support and harmonize core innovation capability to play the role effectively. (p.25)

important role in firm strategy and capability, there are limited researches indicating that the board generally takes on the responsibility. Based on a survey, Ingley and Van der Walt (2001) find that boards in New Zealand generally realize the importance and are willing to share more strategic contributions with management. Under the same survey, protecting assets still appears to be more prioritized. A study conducted by Chung, Wright and Kedia (2003) found a direct support of the role of board in capability development. Their results show that the market valuation of the U.S. firm's capital and R&D investments depends critically on financial analysts' monitoring and on board composition, but not on institutional ownerships. In contrast, the findings of a recent study indicate that independent outside directors may not directly participate in the firm's R&D decisions. They might focus instead on general corporate governance activities. Meanwhile, institutional investors are found to actively monitor and influence the firm's R&D spending whereas securities analysts have neither kind of influence (Le, Walters and Kroll, 2006). Likewise, the relationship between the voluntary formation of technology committees under board control and the performance of the S&P 500 firms are also evidenced though the relatively small amount of listed firms in the U.S. that are found to have technology committees functioning under the board (Bhattacharya and Premuroso, 2006).

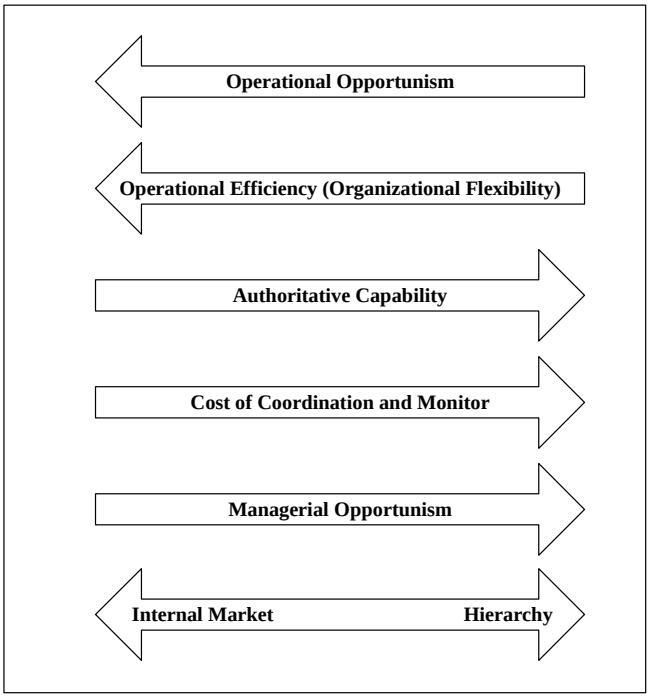
After having studied the modus operandi of boards and the styles of CEOs of U.S. engineering firms, Rebeiz (2001) concludes that the board characteristics do matter for ensuring the balance of power but they appear not to be particularly related to firm capability. The finding indicates that the norm of American firms is to leave the capability issues under management's exclusive responsibility, which has often proved to be a failure. Whereas outsourcing low value-adding work was once believed to give firms a free hand to focus on their core business, an overall preliminary survey indicates that the belief might be only a myth especially in financial service businesses. The poor governance of vendors in handling the services is the prime suspect as the cause of failures (Bielski, 2006). Existing evidences support the belief that boards of directors, particularly in the U.S. play relatively limited role in the development and deployment of firm capability (Chaithanakij, 2007).

This survey does not find a single optimal system for innovation across firms. Moreover, boards of directors tend to have a widely differing view of their main responsibilities across firms, industries and countries. Despite its importance to the firm as suggested by capability scholars, relatively small numbers of boards are found *de facto* paying serious attention to the capability development and deployment of their firms and the influence of boards on firm R&D spending remains very limited. More studies in this arena are needed if any concepts regarding the optimal involvement of boards can be proposed and examined. That should include study of the extent to which boards of director are involved with the initiatives on capability issue without losing their independence as the supervisory bodies of firms. This examination reveals that boards, particularly in the U.S., generally have little role in the development of technological capability. Boars likely choose to show their control power only if firms show serious problems, especially related to their performance.

Figure 1 shows the relation of authoritative capability generated by adding hierarchical layers to firm and its related costs. It also implies the necessity of trust among employees and internal countervailing power, which is traditionally delegated to their board of directors in case of listed firms. The relation in Figure 1 also provides a possible explanation for the relation of hierarchy and innovation: hierarchical structure of firm provides a better condition for a certain kind of innovation – i.e. ones that require a clear direction and lengthy effort on research and development – whereas internal market tends to promote efficiency at a cost of its innovation. Free market is unlikely the most effective mechanism that supports the innovation, but it is probably a reliable mechanism that helps balancing risks and return of innovative endeavors, especially for ones that require high intuition but little financial resources. Hierarchy does not have a clear advantage over individual in this kind of innovation. Boards of directors are generally supposed to exercise their duties by determining a fair balance of risks and return on R&D investments of firms. Due to their limited exposure to firms' operation and directors' diverse background, independent directors do not easily share the same intuition and vision as their CEOs on future innovation and its impact. Obscure by their nature, vision, intuition and

complexity of R&D processes are considered difficult issues for CEOs and outsider directors to communicate and completely agree upon with each other. When the property rights may not be clearly defined, a formal contract is not a viable mechanism for boards to control CEOs. Social norms and trustworthiness of CEOs then play a larger role and all considerations on these issues easily boil down to certain performance target figures. Supported by the norms, U.S. boards appear to avoid an intervention with CEOs' management as long as their firms do not repeatedly suffer bad performance and they instead choose to diligently undertake a less obscure function: protecting the firms' assets. Meanwhile, CEO duality helps CEOs afford to freely pursue their business plans that may require longer period of time before showing any success without boards' intervention.

Figure 1
Authoritative Capability and Disadvantages of Hierarchy



Source: Created by Surasak Chaithanakij to show the relation between authoritative capability associated with hierarchical layers of firm and its related costs.

6. Conclusion and Discussion

Not only does the unclear position of capability in corporate governance cause a dispute on how fiduciary duty is legally fulfilled, it also impairs progress on the study of capability-oriented governance. In this paper, the wider scope of firm capability and authority is combined and established as a major corporate governance component.

The establishment of the authoritative capability concept, which incorporates concentrated ownership and CEO duality into the same capability plane, encounters the incompatible assumptions of two competing capability concepts, opportunism-based or efficiency-based and knowledge-based capabilities. However, further empirical scrutiny reveals a lifecycle linkage of both concepts (Nelson, 1995; Cohen & Levinthal, 1989; Foster & Kaplan, 2001; Wiggins and Ruefli, 2005; Malerba, 2006). The linkage enables us to theoretically integrate both capability concepts into the authoritative capability framework.

Several studies on firm capability and on the governance of capability development are then reviewed through the lens of the authoritative capability as a corporate governance component. Under this survey, the multi-level and multi-dimensional analyses of firm capabilities are found to include sub-firm, firm, interfirm, industry, national, international, dynamic, evolution, and lifecycle components. Fragmented research frameworks, partly resulting from differing firm and industry characteristics, are found to pose a difficulty in the creation of a classification system that enables us to capture the accumulated knowledge as well as to provide us with a direction for future meaningful researches. The categorization of firm capability studies into internal/external, evolutionary dimensions and their related governance systems proposed in this paper is found to serve the purpose only to a limited extent.

The coupling of authority and capability allow us to see a more complete view of firm capability. When the ultimate authority alignment is allowed, either through concentrated ownership or CEO duality, a special kind of firm capability is created. It empowers the firm with a wider scope of business strategies, including ones normally considered extremely risky and unwavering effort put on certain R&D projects, but not without its structural inflexibility of firm

evidenced from its slow and less frequent replacement of CEOs. The combination of authority and capability also enables the firm to co-ordinate loosely coupled networks of specialized suppliers and increase the outsourcing of activities previously performed in house. With prevailing empirical evidences, firm authority and capability are found to be not only much related but also substitutable for each other to a certain extent. While the studies of capability in more advanced economies have begun to move on into specific, firm-level systems of capability, many studies in less advanced economies remain involved with the general aspects of knowledge and capability. There seems to be a consensus that firms in less advanced economies should prepare themselves with absorptive capability for any forms of possible technology transfer.

While the empirical studies of firm capabilities apparently tend to lag behind the theories, the firm-level governance aspects have been left mostly untouched except for a limited amount of studies on the boards' role, which indicates insufficient attention from boards of directors. Both groups of economists, the corporate governance and capability scholars, apparently treat each other's concepts as exogenous. Several from each group are found trying endlessly to prove their respective concepts and totally ignoring the contradictory evidences from their counterparts. Ignoring the basic tenet that sufficient complementary variables are always required for any meaningful explanation, several tests of capability models end up with ambiguity. These types of practices are not expected to end soon in view of present paradigmatic momentum, scope constraints, and the additional burden of incorporating other disciplines into the study. Worst of all, by incorporating exogenous factors such as ones of governance into their studies, there is a chance for the researcher to mistakenly open Pandora's Box, as Foss and Klien (2005) have shown. Calls for the simultaneous consideration of contradictory theories (Finkelstein and D'Aveni, 1994, p. 1103) and determinants (Powell, 2001) keep coming out. The Trimiti corporate governance theory marks one of the early frameworks that follow such requests by simultaneously incorporating both governance control mechanisms and firm capability for testing.

The limited scope of negative fiduciary duties contributes to the narrow legal judgment rendered on agents' behaviors from only the aspects of care and loyalty, which substantially fall

short of the actual purpose of firms. Having the authoritative capability as the corporate governance framework will probably not help us in solving all problems. It is highly likely unable to prevent another case of Enron. The Trimiti framework along with the existing evidences support the argument that there is no single optimal governance structure for firm capability development and deployment. The unambiguous determination of CEOs and boards' performance will never be an easy work. However, the new insight will pave a way for the direction of studies that may lead to more effective legal groundwork for shareholders to control boards and management by being able to distinguish the different accomplishment of doing good for, instead of simply only restraining from doing harm to the companies. Firms exist to seek profit and fulfill other social obligations but they do not exist primarily to save agency cost *per se*. Only when a clear affirmative fiduciary duty of what accounting for the accomplishment can be imposed, can agents be less unambiguously evaluated with or without earning indices. The authoritative capability concept represents one framework intended to serve that purpose. In contrast to conventional belief that only control mechanism plays a crucial role in shaping governance structure in an attempt to preventing opportunism, this paper argues that firm's authoritative capability component plays no less important role in that regard. The review of several studies on firm capabilities in this paper appears to lend support to the framework and its following arguments.

References

Ahrens, J. (2002). *Governance and Economic Development: A Comparative Institutional Approach.* Cheltenham, UK: Edward Elgar.

Anand, A. I. (2005). "An analysis of enabling vs. mandatory corporate governance structures post Sarbanes-Oxley." Available at SSRN: http://ssrn.com/abstract=718341.

Andersen, P. H. (2005). "Distributed innovation in integrated production systems – The case of offshore wind farm." Druid Tenth Anniversary Summer Conference, Copenhagen, Denmark, June 37-29, 2005.

Argyres, N. S., and Liebeskind, J. P. (2002). "Governance inseparability and the evolution of the U.S. biotechnology industry." *Journal of Economic Behavior and Organization* 47(2): 197-219.

Arora, A., and Bokhari, F. (2000). "Vertical integration and dynamics of industry evolution." Carnegie-Mellon University Working Paper. Available at http://www.oekonomi.uio.no/seminar/torsdag-h02/bokhari.pdf.

Arora, A., Fosfuri, A., and Gambardella, A. (2001). *Markets for technology: economics of innovation and corporate strategy*. Cambridge, MA: MIT Press.

Bain, J. S. (1959). *Industrial organization*. New York: Wiley.

Baker, G. P., Gibbs, M., and Hölmstron, B. (1993). "Hierarchies and compensation." *European Economic Review* 37: 366-78.

Banerjee, P. (2003). "Resource dependence and core competence: Insight form Indian software firms." *Technovation* 23: 251-63.

Barney, J. B. (2001). "Resource-based theories of competitive advantage: a ten-year retrospective on the resource-based view." *Journal of Management* 27(6): 643-50.

Baron, D. P. (2006). "Managerial contracting and corporate social responsibility" Stanford GSB Research Paper No. 1945. Available at SSRN: http://ssrn.com/abstract=937945.

Baron, J. N., and Hannan, M. T. (2002). "Organizational blueprints for success in high-tech start-ups: Lessons from the Stanford project on emerging companies." *California Management Review* 44: 8-36.

Bartholomeusz, S., and Tanewski, G. A. (2006). "The relationship between family firms and corporate governance." *Journal of Small Business Management* 44: 245-67.

Baumol, W. J. (1990). "Entrepreneurship: productive, unproductive, and destructive." *Journal of Political Economy* 98: 893-921.

Bernard, A. B., Redding, S. J., and Schott, P. K. (2006). "Multi-product Firms and Product Switching." NBER Working Paper. Available at NBER: http://www.nber.org/papers/w12293.

Bertrand, M., and Schoar, A. (2006). "The Role of Family in Family Firms." *Journal of Economic Perspectives* 20:73-96.

Bhattacharya, S., and Premuroso, R. F. (2006). "Is There a Relationship between Firm Performance and a Firm's Decision to Form a Technology Committee?" Available at SSRN: http://ssrn.com/abstract=932143.

Bielski, L. (2006). "Outsourcing success: It's all in governance." *ABA Banking Journal* (July): 38-42.

Blair, M. M., and Stout, L. A. (2001). "Trust, trustworthiness, and the behavioral foundations of corporate law." *University of Pennsylvania Law Review* 149: 1735-810.

Boyd, B. K. (1995). "CEO duality and firm performance: A contingency model." *Strategic Management Journal* 16: 301-12.

Brockman, E. N., Hoffman James J., Dawley, David D., and Fornaciari, Charles J. (2004). "The impact of CEO duality and prestige on a bankrupt organization." *Journal of Managerial Issues* 16(2): 178-96.

Brown, S. L., and Eisenhardt, K. M. (1998). *Competing on the edge: strategy as structured chaos.* Boston, MA: Harvard Business University Press.

Brusoni, S. (2003). "Authority in the age of modularity." SPRU Working Paper No. 101. Available at SPRU: http//www.sussex.ac.uk/spru.

Buchanan, J. M. (1994). "The minimal politics of market order." *Cato Journal* 11: 215-26.

Burgelman, R. A. (2003). "Strategy making and evolutionary organization theory: Insights from longitudinal process research." Stanford Graduate School of Business Research Paper No. 1844.Available at http://gsbapps.stanford.edu/researchpapers/detail1.asp?Document_ID=2476.

Cañibano, L., Garcia-Ayuso, M., and Sánchez, M. P. (2000). "Shortcomings in the measurement of innovation: Implications for accounting standard setting." *Journal of Management and Governance* 4: 319-42.

Carapeto, M., Lasfer, M. A., and Machera, K. (2005). "Does duality destroy value?" Available at SSRN: http://ssrn.com/abstract=686707.

Carney, M. (2005). "Corporate governance and competitive advantage in family-controlled firms." *Entrepreneurship Theory and Practice* 29: 249-65.

Carney, M., and Gedajlovic, E. R. (2001). "Corporate governance and firm capabilities: A comparison of managerial, alliance, and personal Capitalism." *Asia Pacific Journal of Management* 18: 335-54.

Carpenter, M., Lazonick, W., and O'Sullivan, M. (2003). "Stock market and innovative in the New Economy: the optical networking industry." *Industrial and Corporate Change* 12: 963-1034.

Chaithanakij, S. (2006a). "The determinants for success and failure of corporate governance system: The analysis of Thai corporate governance through the lens of three-pillared framework." Doctor of Philosophy Dissertation, Thammasat University, Bangkok, (in Thai).

Chaithanakij, S. (2006b). "The study of corporate governance in Thailand through the lens of three-pillared model." *Corporate Ownership and Control* 4: 49-64.

Chaithanakij, S. (2006c). "Internal audit function as a corporate governance mechanism: evidence form Thailand." 9th International Conference on Corporate Governance and Board Leadership, Henley Management College, U.K., 3-5 October 2006.

Chaithanakij, S. (2007). "Does the American corporate governance model contribute to economic optimality? A game-theoric analysis", (Jul. 2007), Corporate Governance Seminar, Faculty of Economics, Thammasat U., 27 Aug. 2007.

Cheng, D., and Wu, Y. (2006). "Evolving corporate governance and equity price: The recent evidence." Available at SSRN: http://ssrn.com/abstract=883716.

Cho, H., and Pucik, V. (2005). "Relationship between innovativeness, quality, growth, profitability, and market value." *Strategic Management Journal* 26: 555-75.

Claessens, S., Djankov, S., Fan, J., and Lang, L. (2002). "Disentangling the incentive and entrenchment effects of large shareholdings." *Journal of Finance* 57: 2741-71.

Coase, R. (1937). "Nature of the firm." In O. E. Williamson, and S. E. Masten (eds.) (1999), *The economics o f transaction costs*. Cheltenham, UK: Al Elgar Critical Writings Reader: 3-22.

Cohen, W. M., and Levinthal, D. (1989). "Innovation and learning: the two faces of R&D." *Economic Journal* 99: 569-96.

Cowan, R., David, P. A., and Foray, D. (2000). "The explicit economics of knowledge: codification and tacitness." *Industrial and Corporate Change* 9(2): 211-53.

Daily, C. M., Dalton, D. R., and Cannella, A. A. (2003). "Corporate governance: decades of dialogue and data." *Academy of Management Review* 28: 371-82.

Dalton, D. R., Daily, C. M., Ellstrand, A. E., and Johnson, J. L. (1998). "Meta-analytic reviews of board composition, leadership structure and financial performance." *Strategic Management Journal* 19: 269-90.

Damanpour, F. (1996). "Organizational complexity and innovation: developing and testing multiple contingency models." *Management Science* 42(5): 693-716.

Dahya, J., and Travlos, N. G. (2000). "Does the one man show pay? Theory and evidence on the CEO duality revisited." *European Financial Management* 6(1): 85-98.

Dedman E. (2003)."Executive turnover in UK firms: the impact of Cadbury." *Accounting and Business Research* 33 (1): 33-50.

Demsetz, H. (1997). *The economics of business firms: Seven critical commentaries*. Cambridge: Cambridge University Press.

Denis, D. K., and McConnel, J. J. (2003). "International corporate governance." *Journal of Financial and Quantitative Analysis* 38: 1-36.

Dosi, G., and Marengo, L. (1994). "On the tangled discourse between transaction cost economics and competence-based views of the firm: Some comments." In N. Foss and V. Manhnke (eds.). *Competence, governance, and entrepreneurship*. Oxford: Oxford University Press: 80-92.

Drucker, P. F. (1993). Post capitalist society. New York: Harper-Collins.

Dutta, S., Narasimhan, O., and Rajiv, S. (2005). "Conceptualizing and measuring capabilities: Methodology and empirical application." *Strategic Management Journal* 26: 277-85.

Ebben, J. J., and Johnson, A. C. (2005). "Efficiency, flexibility, or both? Evidence linking strategy to performance in small firms." *Strategic Management Journal* 26: 1249-59.

Edquist, C. (ed.) (1997). *Systems of innovation: technologies, institutions and organizations.* Science, technology and the international political economy series. London: Pinter.

Eisenberg, M. (1999). "Corporate law and social Norms." *Columbia Law Review* 99: 1253-92.

Ernst, D., and Kim, L. (2002). "Global production networks, knowledge diffusion, and local capability formation." *Research Policy* 31: 1417-29.

Ethiraj, S. K., Kale, P., Krishnan, M. S., and Singh, J. V. (2005). "Where do capabilities came from and how do they matter? A study in software services industry." *Strategic Management Journal* 26: 25-45.

Fagiolo, G., and Dosi, G. (2003). "Exploitation, exploration and innovation in a model of endogenous growth with locally interacting agents." *Structural Change and Economic Dynamics* 14: 237-73.

Faleye, O. (2003). "Does one hat fit all? The case of corporate leadership structure." Available at SSRN: http://ssrn.com/abstract=394980.

Felton, R. F., Fritz, P. K. (2005) "The view from the boardroom." *McKinsey Quarterly* (Special Edition): 48-61.

Finkelstein, S., and D'Aveni, R. A. (1994). "CEO duality as a double-edged sword: How boards of directors balance entrenchment avoidance and unity of command." *Academy of Management Journal* 37: 1079-108.

Forbes, D. P. (2005). "Managerial determinants of decision speed in new ventures." *Strategic Management Journal* 26: 355-66.

Foss, K., and Foss, N. J. (2005). "Resources and transaction costs: How property rights economics furthers the resources-based view." *Strategic Management Journal* 26: 541-53.

Foss, N. (1999). "Research in the strategic theory of the firm: 'Isolationism' and 'Integrationism.'" *Journal of Management Studies* 36: 725-55.

Foss, N., and Klein, P. G. (2005). "The theory of the firm and its Critics: A stocktaking and assessment." Available at SSRN: http://ssrn.com/abstract= 695484.

Foster, R., & Kaplan, S. (2001). *Creative destruction.* New York: Double-day.

Gamble, J. E. (2000). "Management commitment to innovation and ESOP stock concentration." *Journal of Business Venturing* 15: 433-47.

Gavetti, G., Levinthal, D. A., and Rivkin, J. W. (2005). "Strategy making in novel and complex worlds: The power of analogy." *Strategic Management Journal* 26: 691-712.

Geu, T. E. (1998). "Chaos, complexity, and coevolution: The web of law, management theory, and law related services at the millennium." *Tennessee Law Review* 66:137.

Gilson, R. (2000). "Globalizing corporate governance: Convergence of form or function." Columbia Law School Working Paper No. 174 and Stanford Law School Working Paper No. 192. Available from SSRN: http://ssrn.com/abstract=229517.

Good, P. I., and Hardin, J. W. (2003). Common Error in Statistics (and How to Avoid Them). Hoboken, NJ: John Wiley & Sons.

Grant, R. M. (1996). "Prospering in dynamically-competitive environments: Organizational capability as knowledge integration." *Organization Science* 7: 375-87.

Griffith, J. M., Fogelberg, L., and Weeks, H. S. (2002). "CEO ownership, corporate control, and bank performance." *Journal of Economics and Finance* 26(2): 170-83.

Guan, J., and Ma, N. (2003). "Innovative capability and export performance of Chinese firms." *Technovation* 23 (9): 737–47.

Gulati, R., Lawrence, P. R., and Puranam, P. (2005). "Adaptation in vertical relationships: beyond incentive conflict." *Strategic Management Journal* 26: 415-40.

Hall, B. H., and Mairesse, J. (2006). "Empirical studies of innovation in the knowledge driven economies." NBER Working Paper. Available at NBER: http://www.nber.org/papers/w12320.

Hansen, G. S., and Hill, C. W. L. (1991). "Are institutional investors myopic? A time-series studies of four technology-driven industries." *Strategic Management Journal* 12: 1-16.

Heracleous, L. (2001). "What is the impact of corporate governance on organizational performance?" *Corporate Governance: An International Review* 9(3): 165-73.

Hill, C. W. L., and Snell, S. A. (1988). "External control, corporate strategy, and performance in research intensive industries." *Strategic Management Journal* 9: 577-90.

Hirschleifer, D. (1993). "Managerial reputation and corporate investment decisions." *Financial Management* 22: 145-60

Holmström, B., and Kaplan, S. N. (2003) "The danger of too much governance." *MIT Sloan Management Review* 45: 96.

Inderst, R., Müller, H. M., and Wärneryd, K. (2005). "Influence costs and hierarchy." *Economics of Governance* 6: 177-97.

Ingley, C. B., and Van der Walt, N. T. (2001). "Strategic board: The changing role of developing and maintaining corporate capability." *Corporate Governance: An International Review* 9(3): 174-85.

Imai, M. (2006). "Mixing family business with politics in Thailand." *Asian Economic Journal* 20: 241-56.

Irani, Z., Beskese, A. and Love, P. (2004). "Total quality management and corporate culture: constructs of organizational excellence." *Technovation* 24: 643-50.

Jacobides, M. G., and Hitt, L. M. (2005). "Losing sight of forest for the trees? Productive capability and gains from trade as drivers of vertical scope." *Strategic Management*

Journal (Forthcoming). Available at SSRN: http://ssrn.com/abstract=596041.

Jacobides, M. G., and Billinger, S. (2005). "Designing the boundary of the firm: from "make/buy or ally" to the dynamics of benefit of vertical architecture." *Organization Science* (Forthcoming). Available at SSRN: http://ssrn.com/abstract=670386.

Jacobides, M. G., and Winter, S. G. (2005). "The coevolution of capabilities and transaction costs: explaining the institutional structure of production." *Strategic Management Journal* 26(5): 395-413.

Jensen, M. C. (1993)." The modern industrial revolution, exit, and the failure of internal control systems." *Journal of Finance* 48(3): 831-80.

Jensen, M. C., and Meckling, W. H. (1976). "Theory of firm: Managerial behavior, agency costs, and ownership structure." In M. C. Jensen (ed.) (2000), *A theory of the firm: governance, residual claims, and organizational forms.* Cambridge, MA: Harvard University Press: 83-135.

Johnson, J. L., Daily, C. M., and Ellstrand, A. E. (1996). "Board of directors: A review and research agenda." *Journal of Management* 22: 409-38.

Klien, P. G., and Lien, L. B. (2003). "Can the survivor principle survive diversification?" Nordic workshop in transaction cost economics in business administration, Bergen, Norway. June 20-21, 2003. Available at NHH: http://mora.rente.nhh.no/conferences/TCEWorkshop2003/papers.htm.

Knight, F. H. (1921). *Risk, uncertainty and profit.* Houghton Mifflin Co.; reprinted Chicago and London: University of Chicago Press, 1971.

Kuhn, T. S. (1996). *The Structure of scientific revolutions (3 rd edn)*. Chicago: University of Chicago Press.

Kuo, T., and Wu, A. (2007). "The determinants of organizational innovation and performance: An examination of Taiwanese electronics industry." Available at SSRN: http://ssrn.com/abstract=921324.

Lacetera, N. (2001). "Corporate governance and governance of innovation: The case of pharmaceutical industry." *Journal of Management and Governance* 5: 29-59.

Langlois, R. N. (1992). "Transaction cost economics in real time." *Industrial and Corporate Change* 1: 99-127.

Langlois, R. N. (1998). "Personal capitalism as charismatic authority: The organizational economics of a Weberian concept." *Industrial and Corporate Change* 7(1): 195-213.

Langlois, R. N., and Foss, N. J. (1997). "Capabilities and governance: The rebirth of production in the theory of economic organization." Druid Working Paper No. 97-2. Available at SSRN: http://ssrn.com/abstract=77668.

La Porta, R., Lopez-de-Silanes, F., Schleifer, A. and Vishny, R. W. (2000). "Investor protection and corporate Governance." *Journal of Financial Economics* 58: 3-27.

Le, S. A., Walters, B., and Kroll, M. (2006). "The moderating effects of external monitors on the relationship between R&D spending and firm performance." *Journal of Business Research* 59: 278-87.

Lenger, A., and Taymaz, E. (2006). "To innovate or to transfer?" *Journal of Evolutionary Economics* 16: 137-53.

Leon, G. C. (2006). "Stigmata: The stain of Sarbanes-Oxley on U.S. capital markets." GWU Law School Public Law Research Paper No. 224 and GWU Legal Studies Research Paper No. 224. Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=921394.

Levitt, B. B., and March, J. G. (1988). "Organizational learning." *Annual Review of Sociology* 14: 319-40.

Leydesdorff, L. (2000). “The triple helix: an evolutionary model of innovations.” *Research Policy* 29: 243-55.

Linck, J. S. Netter, J. M., and Yang, T. (2007). “The determinants of board structure.” Available at SSRN: http://ssrn.com/abstract=729935.

Lodahl, J. B., and Gordon, G. (1972). “The structure of scientific fields and the functioning of university graduate departments.” *American Sociology Review* 37: 57-72.

Lokshin, B., Belderbos, R., and Carree, M. (2006). “Internal and external R&D: Complements or substitutes? Evidence from dynamic data model.” Katholieke Universiteit Leuven Faculty of Economics and Applied Economics Working Paper No. OR0604.

Love, J. H. (2005). “On the opportunism-independent theory of the firm.” *Cambridge Journal of Economics* 29: 381-97.

Low, W., and Cheng, S. M. (2006). “A comparison study of manufacturing industry in Taiwan and China: Manager's perceptions of environment, capability, strategy and performance” *Asia Pacific Business Review* 12(1): 19-38.

Luo, Y. (2000). “Dynamic capabilities in international expansion.” *Journal of World Business* 35: 355-78.

Mahnke, V. (2001). “The process of vertical dis-integration: An evolutionary perspective on outsourcing.” *Journal of Management and Governance* 5: 353-79.

Malerba, F. (2006). “Innovation and the evolution of industries.” *Journal of Evolutionary Economics* 16: 3-23.

March, J. G. (1991). “Exploration and exploitation in organizational learning.” *Organization Science* 2: 71-87.

Martin, S. (1996). “R&D joint ventures and tacit product market collusion.” *European Journal of Political Economy* 11(4): 733-41.

Mikkola, J. H. (2001). "Portfolio management for R&D projects: implication for innovation management." *Technovation* 21: 423-35.

Miller, D. (2003). "An asymmetry-based view of advantage: towards an attainable sustainability." *Strategic Management Journal* 24 (10): 961-76.

Moran, P., and Ghoshal, S. (1999). "Markets, firms, and the process of economic development." *Academy of Management Review* 24: 390-412.

Morck, R., and Yeung, B. (2003). "Family control and the rent seeking society." William Davidson Institute Working Paper No. 585, 2003.

Nelson, R. R. (1995). "Recent evolutionary theorizing about economic change." *Journal of Economic Literature* 33: 48-90

Nickerson, J. A., and Zenger, T. R. (2004). "A knowledge-based theory of the firm-The problem-solving perspective." *Organization Science* 15: 617-32.

Nohria, N. 1996. "From the M Form to the N Form: Taking stock of changes in the large industrial corporation." Harvard Business School Working Paper, Division of Research, 96-054.

North, D. C. (1990). *Institutions, institutional change and economic performance.* Cambridge: Cambridge University Press.

Nowicki, E. A. (2006). "The unimportance of being earnest: Reflection on directors' liability and good faith." Available at SSRN: http://ssrn.com/abstract=921668.

O'Connor, G. C., and McDermott, C. M. (2004). "The human side of radical innovation." *Journal of Engineering and Technology Management* (Forthcoming).

Osterloh, M., and Frey, B. S. (2004). "Corporate governance for crooks? The case for corporate virtue." In A. Grandori (ed.), *Corporate governance and firm organization: Microfoundations and structural firms.* Oxford: Oxford University Press: 191-211.

Ostrom, E. (2005). *Understanding institutional diversity*. Princeton: Princeton University Press.

Peng, M., and Jiang, Y. (2006). "Family ownership and control in large firms: The good, the bad, the irrelevant – and why." The William Davidson Institute Working Paper No. 840.

Penrose, E. (1959). *The theory of the growth of the firm.* New York: Oxford University Press.

Perlow, L., Ohkuysen, G., and Repenning, N. (2002). "The speed trap: Exploring the relationship between decision making and temporal context." *Academy of Management Journal* 45: 931-55.

Peteraf, M. A. (1993). "The cornerstone of competitive advantage: a resource-based view." *Strategic Management Journal* 14(3): 179-91.

Porter, M. E. (1980). *Competitive strategy: Technique for analyzing industries and competitors.* New York: The Free Press.

Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance.* New York: The Free Press.

Powell, T. C. (2001). "Competitive advantage: Logical and philosophical consideration." *Strategic Management Journal* 22: 875-88.

Powell, T. C. (2002). "The philosophy of strategy." *Strategic Management Journal* 23: 873-80.

Powell, T. C., Lovallo, D., and Caringal, C. (2006). "Casual ambiguity, management perception, and firm performance." *Academy of Management Review* 31(1): 175-96.

Rajan R. G., and Zingales, L. (2000). "The governance of the new enterprise." NBER Working Paper. Available at NBER: http://papers.nber.org/papers/W7958.

Rajan, R. G., and Wulf, J. (2003). "The flattening firm: Evidence from panel data on the changing nature of corporate hierarchies." *Review of Economics and Statistics* (Forthcoming). Available at SSRN: http://ssrn.com/abstract=393684.

Ravinchandran, T., and Lertwongsatien, C. (2005). "Effect of information systems resources and capabilities on firm Performance: A resource-based perspective." *Journal of Management Information Systems* 21(4): 237-76.

Rebeiz, K. S. (2001). "Corporate governance and the role of CEO in engineering companies." *Journal of Management in Engineering* 17(1): 14-23.

Rognes, J. (2002). "Organizing R&D in global environment: Increasing dispersed co-operation versus continuous centralization." SSE/EFI Working Paper Series in Business Administration No. 2002:3.

Romano, R. (2005). "The Sarbanes-Oxley Act and the making of quack corporate governance." Yale ICF Working Paper No. 05-23. Available at SSRN: http://ssrn.com/abstract=596101.

Rosekrans, F. M. (1969). "Statistical significance and reporting test results." *Journal of Marketing Research* 6: 451-55.

Rossi-Hansberg, E., and Wright, M. L.J. (2005). "Firm size dynamics in the aggregate economies." NBER Working Paper. Available at NBER: http://www.nber.org/papers/w11261.

Rothaermel, F. T., and Thursby, M. C. (2006). "The nanotech vs. the biotech revolution: Sources of productivity in incumbent firm research." *Research Policy* 36 (Forthcoming). Available at SSRN: http://ssrn.com/abstract=953917.

Rozeboom, W. (1960). "The fallacy of the null-hypothesis significance test." *Psychological Bulletin* 57: 416-28.

Saloner, G., Shepard, A., and Podolny, J. M. (2001). *Strategic management.* New York : John Wiley.

Schumpeter, J. A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle.* Cambridge, MA: Harvard University Press, 1951.

Shapira, Z. (2000). "Governance in organizations: A cognitive perspective." *Journal of Management and Governance* 4: 53-67.

Shea, H. (2006). "Review article - Family firms: Controversies over corporate governance, performance, and management." Available at SSRN: http://ssrn.com/abstract=934025.

Shleifer, A. and Vishny, R. W. (1997). "A survey of corporate governance." *Journal of Finance* 52: 737-87.

Simon, H. A. (1945). *Administrative behavior (3rd edn).* New York: Free Press.

Sundaramurthy, C., Rhoades, D. L., and Rechner, P. L. (2005). "A meta analysis of the effects of executive and institutional ownership on firm performance." *Journal of Managerial Issues* 17: 494-510.

Teece, D. J., and Pisano G. (1994). "The dynamic capabilities of firms: An introduction." *Industrial and Corporate Change* 3(3): 537-56

Teece, D. J., Pisano, G., and Shuen, A. (2000). "Dynamic capabilities and strategic management." In G. Dosi, R. R. Nelson, and S. Winter (eds.), *The nature and dynamics of organizational capabilities.* Oxford: Oxford University Press: 334-62.

Teece, D. J., Rumelt, R., Dosi, G., and Winter, S. (1994) "Understanding corporate coherence." In D. J. Teece (ed.), *Economic performance and the theory of the firm: The selected papers of David J. Teece, Volume 1.* Cheltenham, UK: Edward Elgar, 1998: 187-216.

Viotti, E. B. (2002). "National learning systems: A new approach on technological change in late industrializing economies and evidences from the cases of Brazil and South Korea." *Technological Forecasting & Social Change* 69: 653-80.

Wiggins, R. R., and Ruefli, T. W. (2005). "Schumpeter's ghost: Is hypercompetition making the best of time shorter." *Strategic Management Journal* 26: 887-911.

Williamson, O. E. (1984). "The economics of governance: Framework and implications." *Journal of Institutional and Theoretical Economics* 140: 195-223.

Williamson, O. E. (1985). *The economic institutions of capitalism: Firms, markets, relational contracting.* New York: The Free Press.

Williamson, O. E. (1991). "Comparative economic organization: The analysis of discrete structural alternatives." *Administrative Science Quarterly* 36(2): 269-96.

Williamson, O. E. (2000). "The New Institutional Economics: Taking Stock, Looking Ahead." *Journal of Economic Literature* 38: 595-613.

Winter, S. G. (1988). "On Coase, competence, and the corporation." *Journal of Law, Economics, and Organization* 4: 163-80.

Wolfe, R. A. (1994). "Organizational innovation: review, critique and suggested research directions." *Journal of Management Studies* 31(3): 405-31.

Yiu, D., Bruton, G. D., and Yuan, L. (2005). "Understanding business group performance in an emerging economy: Acquiring resources and capabilities in order to prosper." *Journal of Management Studies* 42(1): 183-206.

Zaheer, A., and Bell, G. G. (2005). "Benefiting from network position: firm capability, structural holes, and performance." *Strategic Management Journal* 26: 809-25

Zahra, S. A., Hayton, J. C., and Salvato, C. (2003). "Organizational culture and entrepreneurship in family firms: A resource-based analysis." Paper presented at the Theory of Family Enterprise Conference, University of Pennsylvania, Philadelphia, December, 2003.

Zhang, Q., Vonderambse, M. A., and Lim, J. (2003). "Manufacturing flexibility: defining and analyzing relationship among competence, capability, and customer satisfaction." *Journal of Operation Management* 21: 173-91.

Zingales, L. (1998). "Corporate governance." In P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*. London: Macimillan: 498.

Zott, C. (2003). "Dynamic capabilities and the emergence of intraindustry differential firm performance: insight from a simulation study." *Strategic Management Journal* 24(2): 97-125.

Notes:

Guan and Ma (2003) divide firm assets into 'core innovation assets', which enable firms to translate innovation concepts through R&D, manufacturing, and marketing process, and 'supplementary innovation assets', which in turn enables them to support and harmonize core innovation capability to play the role effectively. (P.25)