CREATING AND APPROPRIATING VALUE IN ALLIANCE PORTFOLIOS THROUGH PORTFOLIO COMPOSITION AND STRUCTURE

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ABSTRACT

This paper advances theory on firm alliance portfolio value creation and appropriation by examining alliance portfolio composition and structure decisions. Using organizational learning, social capital and transaction cost economics theories, this research explores firm alliance portfolio value maximization while pursuing exploratory and exploitative business strategies. This paper formulates a dynamic approach to alliance portfolio management theory through its alliance portfolio composition and structure propositions that identify desirable new member attributes and preferred alliance network configurations.
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During the last two decades, scholars have expanded their study of business phenomena from the level of the firm to a level that encompasses the interorganizational space of *networks*. Scholarship regarding cooperative interorganizational relationships, called *alliances*¹, has doubled in the past decade.² Scholars have extended their research focus from *alliance dyads* (e.g., Khanna, Gulati & Nohria, 1998; Mowery, Oxley & Silverman, 1996) to *alliance networks* (e.g., Dyer & Hatch, 2006; Gulati, 1998) to *alliance network portfolios* maintained by the firm (e.g., Hoffmann, 2007; Lavie, 2007), where portfolios can consist of multiple alliance networks (Gulati, 1998). Recent strategic management interest in managing alliance portfolios has been directed at portfolio value creation and appropriation that can directly impact firm performance (e.g., Lavie, 2009; Sarkar, Aulakh & Madhok, 2009). This research raises additional questions as it provides answers, such as: How do firms maximize the value of their alliance portfolios? More exactly, how do firms, pursuing exploration and exploitation strategies using network resources, manage their alliance portfolio composition and structure to maximize portfolio value creation and appropriation?

To answer these questions, this paper develops a theoretical framework employing and extending a triadic “alliance” of organizational learning, social capital and transaction cost economics theories. This multi-theoretical framework explains how firm decisions regarding its alliance portfolio composition and structure lead to firm alliance portfolio value creation and value appropriation. This paper contributes to alliance portfolio theory by identifying alliance portfolio optimal composition and structure designed to maximize alliance portfolio value creation and value appropriation and, ultimately, firm performance.
THEORETICAL FRAMEWORK

An “alliance” of organizational learning, social capital and transaction cost economics theories reflects the cognitive, relational and structural dimensions, respectively, of this paper’s theoretical framework. The rationale for this multi-theoretical perspective is presented (see Table 1), along with individual theory shortcomings that are compensated by the other two theories (see Table 2). This paper’s theoretical framework is then compared to the frameworks employed by extant alliance portfolio value journal articles for two reasons: first, to highlight this paper’s integrated approach; and second, to show that organizational learning, social capital and transaction cost economics theories are employed by these other papers in their explanations.

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Organizational learning theory. Organizational learning is a dynamic theory that includes initial conditions, a cognitive theory that encompasses the input of firm performance feedback and the output of firm resources, and a theory that incorporates experiential learning and management intentionality (Cyert & March, 1963; Greve, 1998, 1999; Greve & Taylor, 2000; Levitt & March, 1988; March & Simon, 1958; Teece, Pisano & Shuen, 1997). Our use of organizational learning encompasses both exploratory knowledge generation and exploitative knowledge accessing (Grant & Baden-Fuller, 2004; March, 1991). Organizational learning theory is chosen because learning is a major incentive for firm alliance formation (Barringer & Harrison, 2000; Hamel, 1991; Inkpen & Tsang, 2007; Mowery et al., 1996); learning is dynamic in terms of knowledge and experience acquisition (Levitt & March, 1988); and learning is the basis for accumulating knowledge which is a valuable resource (Hamel, 1991). (See Table 1.) In their study of alliance failure, Park and Ungson (2001: 49) note that “asymmetry in learning
and the subsequent dependence between partners lead to alliance failure.” Organizational learning theory has shortcomings: learning requires hierarchy and authority found within firms but missing in alliances; experiential learning and memory recall are not always beneficial; target orientation is lacking among learners (firm executives) when faced with new knowledge; interfirm knowledge transfer is “sticky”; and learning does not always lead to improved performance due to learning myopia and misleading experience. Both social capital theory and transaction cost economics can adequately compensate for these shortcomings (see Table 2 for detailed explanations and citations).

Social capital theory. Social capital theory is a dynamic theory that defines social capital as a “set of social resources embedded in relationships,” a relational theory that contains a cognitive component of shared interpretations and systems of meanings, a relational component of respect and trusting relationships between network members, and a structural component of network position characteristics (Nahapiet & Ghoshal, 1998; Tsai, 2000; Tsai & Ghoshal, 1998: 464). However, this theory is silent on initial conditions; for example, while Nahapiet and Ghoshal (1998) state that firm interdependence stimulates alliance formation, they do not explain how that condition arises in a social capital context. Social capital theory is selected because the opportunity to gain social capital via higher status, reputation and legitimacy is a strong motivation for firm to join alliances (Walker, Kogut & Shan, 1997); social capital, an output of social networks, is a major benefit of interorganizational relationships over time (Gulati, 1998); social capital in alliances allows firms to leverage access to partners’ resources (Gulati, 1998); social capital promotes interfirm trust and facilitates interfirm knowledge transfer (Schuller, 2007; Snijders, 1999); and relational governance, stemming from trust and social identification, best handles knowledge-based assets in the alliance relationship (Hoetker & Mellewigt, 2009; McGill
& Santoro, 2009; Molina-Morales & Martínez-Fernández, 2009). (See Table 1.) Park and Ungson (2001) note that relationship breakdown is a leading cause of alliance failure. Social capital theory is silent on initial conditions, holds two competing points of view (cohesive ties versus structural holes), and does not explain well the pursuit of economic rents. Organizational learning theory and transaction cost economics both compensate for these shortcomings. (See Table 2.)

**Transaction cost economics theory.** Transaction cost economics is a static theory that deals with initial conditions in the form of governance structures (e.g., alliances as hybrids between markets and hierarchies) that are designed to manage bounded rationality (e.g., incomplete contracts), environmental uncertainty (e.g., turbulent markets) and behavioral uncertainty (e.g., alliance partner commitment fulfillment), while minimizing recurring exchange transaction costs (e.g., monitoring and coordination costs) and opportunism (e.g., rivalry among partners; Nooteboom, 1992; Williamson, 1975, 1985, 1991, 1994, 1999). Transaction cost economics theory is picked because alliances are hybrid governance structures (Williamson, 1991); the opportunity to minimize recurring transaction costs is a major motivation to join alliances (Barringer & Harrison, 2000); alliance governance structures influence contracts and relational norms used to guard against behavioral and environmental uncertainty and partner opportunism (Williamson, 1999); governance structures reduce appropriation and spillover concerns enabling network members to focus on optimizing alliance outcomes (Zajac & Olsen, 1993); and formal governance, based on contracts and other agreements, best handles property-based assets in the alliance relationship (Hoetker & Mellewigt, 2009; McGill & Santoro, 2009). (See Table 1.) Park and Ungson (2001) conclude that another key factor in alliance failure is the alliance’s inability to perform as an alternative governance structure. Shortcomings of transaction cost
economics include an assumption of equilibrium; the development of trust is disregarded; it is mechanistic because it focuses on costs and ignores alliance joint value maximization; and risk neutrality is employed as a questionable assumption. Both organizational learning and social capital theories compensate for these shortcomings in transaction cost economics. (See Table 2.)

Overall, our theoretical framework of three theories contains two that are dynamic and two that address initial conditions. While all three theories make major contributions to alliance portfolio valuation, they each contain shortcomings that are, for the most part, compensated by the other two theories. However, social capital only partially corrects for deficiencies in experiential learning and memory recall, and can compensate for behavioral uncertainty in the face of learning myopia and misleading experience but not for environmental uncertainty (see Table 2).

**Literature comparison.** Having established our theoretical framework, we compare it to those embraced by other alliance portfolio valuation journal articles. The latter is a small sample, consisting of only 11 journal articles published in the past nine years (see Table 3).³ Two articles lack theoretical frameworks, while the remaining nine papers employ 11 different theories. Combining both resource-based view, or RBV (e.g., Barney, 1991), and resource-dependency (e.g., Pfeffer & Salancik, 1978) theories, resource-related theories are the most influential in this sample, and will be compared to our theoretical framework.

The resource-related theories are considered static (Eisenhardt & Martin, 2000: 1118; Gilsing, Lemmens & Duysters, 2007: 228; Lavie, 2006: 651; Priem & Butler, 2001: 33). Other scholars have highlighted the lack of initial conditions in the resource-related theories

There are more fundamental questions for the resource-related theories: “[W]hat is a unique resource? What makes it valuable?” questions that Porter (1991: 108) said went unanswered by the RBV. Considered by Wernerfelt (1984) as a source of inspiration for the resource-based view, Penrose (1959: 76) noted that the interconnection of physical and human resources yield services from material resources envisioned by firm knowledge:

The possibilities of using services change with changes in knowledge. More services become available, previously unused services become employed and employed services become unused as knowledge increases about the physical characteristics of resources, about ways of using them, or about products it would be profitable to use them for. Consequently, there is a close connection between the type of knowledge possessed by the personnel of the firm and the services obtainable from its material resources. That the knowledge possessed by a firm’s personnel tends to increase automatically with experience means, therefore, that the available productive services from a firm’s resources will also tend to change.

As Farquhar (1919: 486) succinctly stated forty years earlier: “Knowledge without capital is a stronger asset than is capital without knowledge, for knowledge may be capitalized while capital cannot be educated.” Hence, it is not the resources that produce competitive advantage (Barney, 1991) but the services from those resources, inspired by organizational learning and knowledge of the firm’s management (Penrose, 1959). We conclude from our comparative review that the resource-related theories offer a more limited explanation for the dynamism of alliance network dynamics and firm alliance portfolio valuation than the theoretical triad we employ.

In one last comparative exercise with the alliance portfolio value extant literature, we examine the 11 journal articles in our sample to examine whether they employ any of the three theories in our framework. In each article, we find numerous examples of each theory being applied but report only three examples of each theory for each firm using illustrative quotations
due to space limitations (see Table 3). Note that while Lavie (2006, 2007, 2009) includes bargaining power, opportunistic behavior and contractual agreements in his extension of the resource-based view (Lavie, 2006: 639n1), all three concepts originate from transaction cost economics (Williamson, 1971, 1975.) The 11 journal articles contain numerous examples where all three theories of this paper are applied, further validating this paper’s approach.

**LITERATURE REVIEW**

We first explain alliance network portfolios using our theoretical triad, starting with the firm’s initial conditions in the form of firm resources, and then include network resources and the firm’s alliance portfolio. We then show how those theories explain alliance portfolio value creation and appropriation.

**Alliance Network Portfolios**

**Firm resources.** Firm human resources are formed from individuals who join the new organization (Aldrich, 1999; Scott, 2003), where organizational learning and knowledge is the result of individual learning and knowledge developed and integrated through social interaction within the organization’s hierarchy and authority (Cole & Lee, 2003; Crossan, Lane & White, 1999; Nonaka, 1994). As the organizational members follow the firm’s hierarchy and authority, they accumulate additional human resources as well as financial and physical resources (Scott, 2003). Their successful operations and favorable stakeholder interactions (e.g., customers, suppliers, investors) yield favorable financial results and produce social capital in the form of reputation, status, legitimacy and trust: “Thus, good performance engenders interorganizational trust” (Gulati & Nickerson, 2008: 696). The firm functions as a hierarchy operating in various markets (Williamson, 1975). In the face of increased environmental uncertainty and transaction costs, greater need for complementary resources, and opportunities to leverage its social capital, the
A firm chooses to establish hybrid governance structures in the form of alliances (Eisenhardt & Schoonhoven, 1996; Williamson, 1991). Over time, the firm operates in one or more alliance networks (Gulati, 1998), with access to resources beyond its boundaries (Lavie, 2006).

**Alliance network resources.** Alliance networks are interorganizational relationships of a lasting, strategic nature for member firms that include franchising, joint ventures, licensing, long-term customer-supplier partnerships, and strategic alliances (Gulati, Nohria & Zaheer, 2000). Alliance networks are conduits for valuable knowledge and material resources possessed by firm partners (Gulati, 2007). Alliance network resources are: (1) shared resources, e.g., valuable knowledge gained from the network (Dyer & Hatch, 2006), derived from ties that firms have with key partners outside their formal boundaries that allow them to access their “partners’ tangible and intangible assets, including their human resources, financial assets, marketing efforts, R&D investments, and reputation” (Gulati, 2007; Lavie, 2006, 2007: 1191, 2009; Lavie & Miller, 2008); (2) signaling devices that convey reputation in the form of social status and respect (Stuart, 2000); and (3) collections of firm hybrid governance structures designed to mitigate asset specificity and opportunism while minimizing transaction costs (Riordan & Williamson, 1985).

**Alliance network portfolios.** Alliance portfolios are firms’ sets of direct alliances with partners that collectively contain network resources (Lavie, 2006, 2007, 2009; Lavie & Miller, 2008; Ozcan & Eisenhardt, 2009) and can include multiple networks (Gulati, 1998). Parise and Casher (2003: 35) observed that the “degree to which an enterprise captures, shares, and leverages information and knowledge across its alliance portfolio” has “a direct effect on performance and learning outcomes.” Different types of network ties result in different portfolios of alliance network resources that produce different outcomes for firms (Gulati, 2007; Shan, Walker &
Kogut, 1994), so that the more firm alliance portfolios are endowed with valuable network resources—valuable because of the profitable knowledge-enabled services derived from them (Penrose, 1959)—the greater firm performance will be (Lavie, 2007). However, since alliance success has historically been problematic, firms will be unable to capture such valuable network resources unless they optimize their alliance portfolios as a whole (Lavie, 2009). Having established that alliance network portfolios are valuable because they enhance firm performance, we now examine how firms can create and appropriate value through their alliance portfolios.

**Alliance Portfolio Value Creation and Value Appropriation**

In an organizational setting, value creation, or *use value*, refers to the making of product or service features by organizational members perceived by customers as meeting their needs; value appropriation, on the other hand, is the realization of *exchange value* determined by buyer-seller bargaining relationships (Bowman & Ambrosini, 2000). In an alliance network context, value creation is performed by alliance network member firms through the complementarity of network resources, while firm value appropriation capacity is primarily determined by the relative bargaining power among alliance network members (Lavie, 2007, 2009).

**Alliance portfolio value creation.** Alliance portfolio value creation uses exploratory learning to make product or service offerings perceived by customers to be of value to them (Bowman & Ambrosini, 2000; Dyer & Singh, 1998; Lavie, 2006, 2007, March, 1991). Firms can improve their performance by leveraging network resources through three related, value-creation mechanisms: (1) achieving access to partner complementary assets that support commercialization of firm products or service offerings (Mowery et al., 1996; Rotheaermel, 2001a; Rotheaermel & Boeker, 2008); (2) internalizing partners’ intangible assets such as new knowledge and skills that enhance firm legitimacy and capacity to obtain additional resources
(Hamel, 1991; Lavie, 2006, 2007) and (3) generating synergies by combining network resources with their own internal resources, especially combining network resources to gain synergies unavailable to alliance portfolio partners (Dyer & Singh, 1998; Ireland, Hitt & Vaidyanath, 2002; Lavie, 2007). Synergy-creating interdependencies can occur in alliance portfolios where partners can positively impact each other because they are members of the same network, support similar standards and infrastructure, provide complementary resources, learn from each other, or consider other portfolio members as a means to reduce their own risk (Wassmer, forthcoming). These mechanisms or strategies produce relational rents (Dyer & Singh, 1998), so that the more endowed firm alliance portfolios are with valuable network resources, the greater will be relational rents and expected firm performance (Lavie, 2007).

Organizational learning theory, especially when resources are knowledge-based, aptly explains the motivation, processes, and outcomes of the three value-creation mechanisms (Barringer & Harrison, 2000; Hamel, 1991; Lavie, 2009; Mowery et al., 1996). Exploratory learning is needed to acquire and assimilate external knowledge and to combine it with internal knowledge, a capability that requires absorptive capacity (Cohen & Levinthal, 1990; March, 1991). Firm absorptive capacity (Cohen & Levinthal, 1990) and its interfirm counterpart relative absorptive capacity (Dyer & Singh, 1998; Lane & Lubatkin, 1998) are major determinants of the firm’s ability to create value through interfirm knowledge transfers (Mowery et al., 1996). Another aspect of alliance portfolio value creation is social capital, generated from repeated social interactions between firms which facilitates trust and engenders learning between firms (Nahapiet & Ghoshal, 1998; Yli-Renko et al., 2001), both of which enhance portfolio value. Choice of governance structure for value creation appears limited to either alliance (hybrid) or acquisition (hierarchy; Wang & Zajac, 2007). While the latter governance structure appears most efficient
from a transaction-cost-minimizing criterion (Williamson, 1975, 1985), often less efficient
governance modes such as alliances can better maximize joint value (Zajac & Olsen, 1993).

**Alliance portfolio value appropriation.** Alliance portfolio value appropriation reflects
the exchange value set by the joint effects of exploitative learning (Koza & Lewin, 1998) and the
relative bargaining of network members (Bowman & Ambrosini, 2000; Lavie, 2007).
Exploitative learning is reflected in the ability of firms to internalize their partners’ skills
(Hamel, 1991), an ability that requires absorptive capacity (Cohen & Levinthal, 1990; Dyer &
Singh, 1998; Lane & Lubatkin, 1998). Relative bargaining power reflects the ability to change
agreements, obtain accommodations, and influence negotiation outcomes between the focal firm
and its alliance partners (Lavie, 2007), and thus determines the proportion of private benefits
versus common benefits accrued by firms (Khanna et al., 1998).

Successful navigation by firms in the alliance portfolio value appropriation arena requires
a combination of organizational learning, social capital and transaction cost economics.
Organizational learning is important to firms in “that they learn how to cope with the tradeoffs
and interdependencies entailed by alliance portfolios” (Lavie, 2009: 36). Assurances by the firm
that it will be fair in its dealings with all partners build trust, a form of social capital (Lavie,
2009). Depending upon the degree of environmental uncertainty, e.g., varying regimes of
appropriability (Teece, 1986), behavioral uncertainty, e.g., opportunism, and asset specificity
(Williamson, 1991), firms will attempt to establish governance structures that will be most
advantageous to their value appropriation goals.

**Alliance Portfolio Composition and Structure**

**Alliance portfolio composition.** Traditionally, researchers have focused on structural
and relational features of alliance portfolios (e.g., Rowley, Behrens & Krackhardt, 2000), and
have devoted less attention to firm partners’ characteristics (e.g., Stuart, 2000), which can impact firm performance due to communications and resource exchange impediments with partners as well as inappropriate use of collaborative routines (Lavie & Miller, 2008). Alliance partner selection has been found to be the single most influential factor in determining overall alliance portfolio success (Lavie, 2009).

Alliance portfolio composition deals with alliance partner characteristics that enhance and detract from the value of firm alliance portfolios, and are of greater importance than network structure because structure often represents member compositional qualities (Felin & Hesterly, 2007; Lavie, 2009; Stuart, 2000). Sarkar et al. (2009) find that the firm’s overall alliance strategy is reflected in the composition of its alliance portfolio, based on the firm’s focus on portions of its value chain or its diversification. Composition of firm alliance portfolios has a bearing on the firm’s ability to create and appropriate value, with a paradox that while rich, powerful partners have great potential to contribute to alliance portfolio joint value creation, these same partners also have great potential to restrict focal firm value appropriation and undermine the latter’s performance (Lavie, 2007, 2009; Stuart, 2000). Hence, firms should choose alliance partners that have desired complementary resources or unique intangible assets yet do not possess strong bargaining power relative to the focal firm, and whose composition minimizes bilateral competition while maximizing multilateral competition (Lavie, 2007, 2009; Wassmer, forthcoming). Bilateral competition can be minimized by determining the relative scope of partners’ market activities to identify more desirable partners whose scope of activities have greater overlap with the scope of alliance activities, resulting in higher common benefits and lower private benefits (Khanna et al., 1998). While the inclusion of similar partners—especially partners that are competitors—may add little to firm network resources and, hence,
value creation, the presence of redundant partners increases prospects for multilateral
competition advantageous to firm value appropriation (Gimeno, 2004; Lavie, 2007, 2009).

Organizational learning theory explains alliance portfolio composition success whereby
firms understand their own needs and know the resources of prospective partners, and firms
comprehend how each alliance portfolio partner and its alliances influences other portfolio
partners (Lavie, 2009). Firm partner selection not only influences the firm’s capabilities but
others’ perceptions of its capabilities (Baum, Calabrese & Silverman, 2000; Lin, Yang & Arya,
2009). Social capital theory suggests that firms should build trust with new partners by either
taking large and costly gambles with them, thus placing themselves into positions of
vulnerability and inviting their partners to reciprocate, or by demonstrating that they are reliable
firms by ensuring that all partner commitments are fully met (Gulati, Khanna & Nohria, 1994).
Transaction cost economics mirrors social capital theory in suggesting use of economic hostages
in bargaining relationships to reduce related transaction costs (Williamson, 1985, 1996).

Alliance portfolio structure. According to George, Zahra, Wheatley and Khan (2001),
organizational learning and relational (mix of social capital and transaction cost economics)
perspectives indicate that alliance portfolio structures impact the innovative and financial
performance of partner firms by promoting learning and knowledge transfers, building trust and
reducing opportunism among partners. Alliance portfolio structures can be composed of various
kinds of alliances and alliance networks. Transaction cost economics has identified one type of
alliance dichotomy: Link versus scale alliances, the former value-chain-asymmetric partnerships
combining different and complementary resources and capabilities, and the latter value-chain-
symmetric partnerships designed to achieve economies of scale (Dussauge, Garrette & Mitchell,
2000, 2004; Hennart, 1988). As an additional alliance dichotomy, organizational learning theory
has produced *exploratory* versus *exploitative* alliances corresponding to March’s (1991) organizational learning dichotomy to explore new opportunities or exploit existing capabilities (Koza & Lewin, 1998; Rothaermel & Deeds, 2004).

Social capital theory has recognized three different network structure dichotomies: *Structural holes* networks emphasize social capital developed from brokerage opportunities taken from disconnected portions of networks (Burt, 1992); *cohesive ties* networks highlight social capital developed from dense, interconnected networks of repeated ties among network members (Coleman, 1988; Walker et al., 1997); and *dual* networks, networks of small cores of strong ties integrated with a larger periphery of weak ties (Capaldo, 2007). Empirical studies by Gulati, Lavie and Singh (forthcoming), Phelps (forthcoming) and Tiwana (2008) support the dual networks notion of an optimal mix of strong and weak ties to achieve maximum value creation. Vanhavebeke, Gilsing, Beerkens and Duysters’ (2009) empirical work found that firms are more successful in creating new technology in non-core areas when they employ dual networks, outperforming firms using structural holes networks because of the need for absorptive capacity found in dual networks’ small cores of strong ties to facilitate tacit knowledge transfer, and surpassing firms employing cohesive ties networks because of the need for diverse, new knowledge obtained via dual networks’ peripheries of weak ties.

We have reviewed the key concepts as firm resources, alliance network resources and firm alliance portfolios, alliance portfolio value creation and appropriation, and alliance portfolio composition and structure. We turn our focus toward alliance portfolio-building phenomena. Our specific focus is to advance propositions regarding the development of alliance portfolio composition and structure under varying endogenous and exogenous conditions.

**THEORY**
This section develops propositions explaining how firms, pursuing business strategies of exploration and exploitation, manage their alliance portfolios’ composition and structure to maximize their portfolio’s value. Our portfolio composition propositions initially focus on firm size and then on varying market life cycle stages. Our portfolio structure propositions first examine knowledge resource types and then varying regimes of appropriability.

**Theory Boundaries**

**Key assumptions.** We form the basis of our “alliance” of organizational learning, social capital and transaction cost economics theories with a few assumptions. We presume that firms are free to make decisions regarding their alliance portfolio composition and structure so that they are not constrained by poorly embedded (peripheral) network positions (Ahuja, Polidoro & Mitchell, 2009); however, these decisions are influenced by factors internal and external to firm alliance portfolios (Ireland, Hitt & Webb, 2006). Internally, we assume that firms pursue business strategies of exploration and exploitation at different levels of resource endowment indicated by firm size that involve exchanges of tacit (implicit) and codified (explicit) knowledge (Lavie & Rosenkopf, 2006; Polanyi, 1966; Rothaermel & Deeds, 2004). Externally, we presume that firm decisions are also influenced by environmental factors such as market life cycle stages and appropriability regimes (Ireland et al., 2006).

**Scope.** The level of analysis in this section is the firm while the unit of analysis is the firm’s alliance portfolio. The firm’s alliance portfolio includes both active alliances and past alliances that have become inactive (Wassmer, forthcoming) since experiential learning and social capital are integral to this paper’s theoretical framework. Categorically, this paper includes all types of alliances. This section deals with the selection and configuration of alliance
network member firms with the objective function to optimize the value of firm alliance portfolios. We emphasize knowledge as the key network resource among many such resources.

**Propositions**

**Business strategies.** Firms pursue business strategies of exploration and exploitation that shape their alliance portfolio composition and structure decisions (Hoffmann, 2007; March, 1991). Exploration and exploitation are employed as business strategies and not alliance portfolio strategies, although portfolio strategies are derived from business strategies (Hoffmann, 2007). Business strategies play a role in determining firm alliance portfolio value creation and value appropriation configurations which reflect portfolio relational and structural characteristics (Hoffmann, 2007). Exploratory alliances represent opportunity-seeking behavior that generates new knowledge to fill firm knowledge gaps, while exploitative alliances take advantage of market opportunities to leverage new combinations of knowledge and other firm resources (Ireland et al., 2006). Exploratory alliances integrate complementary knowledge and other resources between firms while exploitative alliances combine similar knowledge and other resources to produce economies of scale or increased market power (Harrison, Hitt, Hoskisson & Ireland, 1991, 2001). While exploratory alliances face uncertainty about their outcomes over long periods of time, exploitative alliances are more certain and can achieve their objectives in shorter periods of time (Ireland et al., 2006).

**Alliance portfolio strategies.** Firms following exploratory strategies with sufficient resource endowment choose Hoffmann’s (2007) *shaping* alliance portfolio strategy, encompassing relatively few alliances of rather strong ties, rather low dispersion and rather high redundancy, characterizing the dual network (Capaldo, 2007). Firms pursuing exploratory strategies constrained by resources adopt Hoffmann’s (2007) *adapting* alliance portfolio strategy,
involving many alliances of weak ties, high dispersion and low redundancy, characterizing the structural holes network (Burt, 1992). Firms pursuing exploitative strategies correspond to Hoffmann’s (2007) stabilizing alliance portfolio strategy, featuring few alliances, strong ties, low dispersion and high redundancy. Hoffmann’s (2007) two types of stabilizing strategies include vertical customer-supplier networks, characterizing the cohesive ties network (Coleman, 1988), and horizontal collusion networks, characterizing the scale network (Dussauge et al., 2000, 2004; Hennart, 1988).

**Alliance portfolio composition.** Firm alliance portfolio composition selection decisions that choose new alliance network members involve both general and contingent criteria. Generally, firms should select alliance network members that possess slack resources, are profitable and currently do not have a lot of alliances (Lavie, 2007). Firms should avoid potential partners that participate in many alliances because that gives them greater bargaining power over partners that have few alternatives (Lavie, 2007, 2009). Firms selected for network membership should have their total market activities considerably overlap with the alliance’s total market activities because it increases the chances that the prospective alliance partner’s private benefits will be small compared to the alliance’s common benefits, and thus minimize the risk of potential partner opportunism (Khanna et al., 1998). Organizational learning theory describes how firms learn from their alliance experiences so that they better understand their own resources and capabilities and those of prospective partners (Kale, Dyer & Singh, 2002; Lavie & Miller, 2008; Sarkar et al., 2009); social capital theory explains why firms work to build trust among their new partners (Gulati et al., 1994); and transaction cost economics clarifies why firms employ hybrid governance structures that underlie all alliance portfolio frameworks (Williamson, 1979, 1985, 1991, 1999). Hence, meeting general criteria regarding alliance
portfolio composition will increase firm alliance portfolio value by building trust with its partners while reducing costs associated with partner opportunism.

Firm exploratory-exploitative alliance portfolio member selection decisions are influenced by both endogenous and exogenous factors, such as firm size and the market life cycle stages of market growth and market maturity. Starting with endogenous factors, the focal firm’s size is salient to alliance partner decisions in both an absolute and relative sense. On an absolute basis, larger firms have a larger scope of technological and market activities and a greater likelihood of possessing slack resources and dynamic capabilities necessary for investing in and maintaining alliances (McGill & Santoro, 2009). Smaller firms are often younger, often entrepreneurial and sometimes able to develop radical inventions than larger, often older, often bureaucratic, and often disposed to develop incremental inventions (Nelson & Winter, 1982; Schumpeter, 1934, 1942; Rothaermel, 2000, 2001a, 2001b).

On a relative basis, small firms pursuing exploratory (value creation) strategies often ally themselves with larger firms outside their industries to avail themselves of the larger partner’s technologically distant knowledge and other complementary resources, e.g., small biotechnology firms with promising molecules linking up with larger pharmaceutical companies that possess clinical development and manufacturing capabilities needed to commercialize those molecules (Arikan, forthcoming; Nerkar & Roberts, 2004; Rothaermel & Deeds, 2004; Stuart, 2000). Large firms pursuing exploration (value creation) will tend to link up with smaller, more entrepreneurial (market savvy) firms outside their industries to achieve market complementarity, i.e., access new markets (Ireland et al., 2006; Mitsuhashi & Greve, forthcoming). (See Figure 1.)

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Small firms pursuing exploitative (value appropriation) strategies are more likely to link up with larger firms within their industries that are marketing dominant that possess resource compatibility, i.e., similar knowledge and other resources, required for close coordination to achieve market penetration and rent appropriability (Ireland et al., 2006; Mitsuhashi & Greve, forthcoming; Teece, 1986). Large firms pursuing exploitation (value appropriation) are less likely to form alliances for that purpose, but if they do require exploitative alliances to achieve economies of scale they would seek large partners within their industries that are technologically strong and have resource compatibility so that resources can be pooled to achieve scale advantages (Ireland et al., 2006; Mitsuhashi & Greve, forthcoming).

Organizational learning theory explains exploratory alliance partner selection decisions in terms of knowledge exchange (Hamel, 1991; Lane & Lubatkin, 1998; Lavie & Rosenkopf, 2006), and accounts for exploitative partnering in terms of similar knowledge and expertise (Koza & Lewin, 1998; Lavie & Rosenkopf, 2006). Social capital theory emphasizes that trust is the dominant logic in exploratory alliance partner selections and that relational governance is the most effective mechanism for managing knowledge-based assets (Hoetker & Mellewigt, 2009; Ireland et al., 2006), while explaining exploitative partnering in terms of a lack of trust among partners that are potential bilateral competitors since they reside within the same industries (Lavie, 2007). Transaction cost economics is largely silent regarding the governance of knowledge transfer inherent in exploration (Williamson, 1999), while pointing to the effectiveness of formal governance structures in exploitative alliances where property-based assets are dominant (Hoetker & Mellewigt, 2009; Williamson, 1999). Hence, we propose that:

Proposition 1a. Small firms pursuing exploration will tend to maximize their alliance portfolio value by choosing larger partners outside their industries that are technologically strong with complementary knowledge and other resources.
Proposition 1b. Large firms pursuing exploration will tend to maximize their alliance portfolio value by choosing smaller partners outside their industries that are market dominant with complementary knowledge and other resources.

Proposition 1c. Small firms pursuing exploitation will tend to maximize their alliance portfolio value by choosing larger partners within their industries that are market dominant with similar knowledge and other resources.

Proposition 1d. Large firms pursuing exploitation will tend to maximize their alliance portfolio value by choosing large partners within their industries that are technologically strong with similar knowledge and other resources.

In terms of exogenous factors, Sidhu, Commandeur and Volberda (2007) found that optimal firm innovation levels coincided during dynamic environments, characterized by market growth, with nonlocal (exploratory) supply-side (technological) search paired with local (exploitative) demand-side (market) search, while during less dynamic environments, characterized by market maturity, non-local (exploratory) demand-side (market) search tied with local (exploitative) supply-side (technological) search was optimal. This suggests that during market growth, firms pursuing exploration (value creation) choose technologically strong partners with complementary knowledge and other resources located outside their industries and that during market maturity, firms pursuing exploration (value creation) choose marketing dominant partners with complementary knowledge and other resources outside their industries. By picking partners external to their industries, firms obtain new, diverse ideas while avoiding the possibility of bilateral competition and diminished bargaining power that will reduce value appropriation (Lavie, 2007, 2009). Mitsuhashi and Greve (forthcoming) term this extra-industry approach as market complementarity, the use of alliances to access new markets. These exploratory alliances are similar to link alliances since different parts of firm value chains are involved (Dussauge et al., 2000, 2004; Hennart, 1988). (See Figure 2.)

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Insert Figure 2 about here
Conversely, for firms pursuing exploitation (value appropriation) during market growth, alliance partners should be marketing dominant firms with similar knowledge and other resources located within their industries, while during market maturity, partners selected should be technologically strong firms with similar knowledge and other resources within their industries, which Mitsuhashi and Greve (forthcoming) term resource compatibility. By selecting partners within industries, these competitors will increase multilateral competition that enhances firm bargaining power and subsequent value appropriation (Lavie, 2007, 2009). These exploitative alliances are similar to scale alliances that achieve economies of scale since common portions of firm value chains are involved (Dussauge et al., 2000, 2004; Hennart, 1988).

Organizational learning, social capital and transaction cost economics theories explain exploratory and exploitative alliance partner selection under market growth and maturity using the same rationales as they did for exploratory and exploitative alliance partner choices where the size of the focal firm varied. Hence, we propose that:

*Proposition 2a. Firms pursuing exploration strategies during market growth will tend to maximize their alliance network portfolio value by choosing partners that are technologically strong with complementary resources located outside their industries.*

*Proposition 2b. Firms pursuing exploration strategies during market maturity will tend to maximize their alliance network portfolio value by choosing partners that are marketing dominant with complementary resources located outside their industries.*

*Proposition 2c. Firms pursuing exploitation strategies during market growth will tend to maximize their alliance network portfolio value by choosing partners that are marketing dominant with similar resources located within their industries.*

*Proposition 2d. Firms pursuing exploitation strategies during market maturity will tend to maximize their alliance network portfolio value by choosing partners that are technologically strong with similar resources located within their industries.*
**Alliance portfolio structure.** While selecting the optimal alliance network members based on strategy and market life cycle stage is critical to value creation and value appropriation, picking the right alliance network structure is also important because it will guide and reinforce the desirable partners’ behaviors. Creating and appropriating value in alliance portfolios requires exploratory and exploitative learning to respectively invent and commercialize product or service innovations of value to customers (Bowman & Ambrosini, 2000; Dyer & Singh, 1998). To balance exploratory and exploitative learning across the firm (Lavie & Rosenkopf, 2006), firms manage alliance portfolios that have multiple networks (Gulati, 1998).

Different alliance portfolio structures best support value creation when pursuing exploratory strategies where the transfer of different kinds of knowledge is involved. Since learning is at the heart of value creation (Lavie, 2007), two types of knowledge, tacit and codified (Polanyi, 1966), are salient to creating value. Value creation using tacit knowledge is generally more valuable to the firm because tacit knowledge is one factor (complexity and asset specificity are the others) that can produce interfirm casual ambiguity (King, 2007; Reed & DeFillippi, 1990).

When firms pursue exploratory (value creation) strategies requiring tacit knowledge exchange, the optimal alliance portfolio structure is the dual network, characterized by strong, redundant ties from repeated interactions and noncompetitive approaches with a small core of trusted partners surrounded by weak ties to a large number of other partners (Capaldo, 2007; Inkpen & Tsang, 2005; Uzzi, 1997). The peripheral group is used to obtain the diversity of knowledge and other complementary resources needed in pursuing exploration (Wang & Zajac, 2007) while the core group shares tacit knowledge in exploiting diverse resources from the periphery. High levels of trust among core group members reduce the risk of unintended knowledge spillovers (Cohen & Levinthal, 1990; Capaldo, 2007). The characteristics of dual
networks in some ways resemble link alliances because there are connections between value-chain-asymmetric partners. Dual networks follow Hoffmann’s (2007) shaping alliance portfolio strategy. (See Figure 3.)

When firms pursue exploration (value creation) involving primarily codified knowledge, the optimal alliance portfolio structure is a structural holes network, characterized by the firm acting as a broker of knowledge and other complementary resources by bridging disconnections between network members through the use of weak ties (Burt, 1992; Uzzi, 1997). The use of this network obtains the diversity of complementary knowledge and other resources necessary for exploration (Wang & Zajac, 2007) in an efficient manner (Schoenmakers & Duysters, 2006), but without a high risk of unintended knowledge spillovers and other private benefits (Khanna et al., 1998). Structural holes networks follow Hoffmann’s (2007) adapting alliance portfolio strategy.

When firms pursue exploitative (value appropriation) strategies involving the transfer of tacit knowledge, a cohesive ties network is the optimal structure, involving firms with similar resources and routines necessary for exploitation (Schoenmakers & Duysters, 2006; Wang & Zajac, 2007) that enhance the transfer of tacit knowledge (Dussauge et al., 2000, 2004; Hennart, 1988). Cohesive ties networks involve strong, trusting ties that mitigate the loss of proprietary knowledge while enhancing the transfer of tacit knowledge (Capaldo, 2007). Cohesive ties networks follow Hoffmann’s (2007) customer-supplier stabilizing strategy.

When firms pursue exploitation (value appropriation) involving the transfer of codified knowledge, the optimal network structure is the scale network, characterized by sets of firms with similar knowledge and other resources and routines needed for exploitation that form scale
alliances (Capaldo, 2007; Wang & Zajac, 2007). In scale networks, there is risk of losing proprietary knowledge due to the presence of competitors in network membership (Dussauge et al., 2000, 2004); however, since the focus is exploiting existing knowledge by achieving economies of scale via pooled resources, the risk of unintended knowledge spillovers appears to be slight. Mitsuhashi and Greve (forthcoming) would term codified knowledge as an observable resource most appropriate for exploitation via scale networks, in contrast to tacit knowledge which is an unobservable resource best suited for exploration. Scale networks follow Hoffmann’s (2007) collusion stabilizing strategy.

Organization learning theory explains the choice of dual networks in terms of tacit knowledge transfer coupled with brokerage, structural holes through the use of brokerage, cohesive ties networks because they facilitate the transfer of tacit knowledge like dual networks, and scale networks transferring codified knowledge as requiring little or no absorptive capacity (Cohen & Levinthal, 1990; Koza & Lewin, 1998; Lane & Lubatkin, 1998; Lavie & Rosenkopf, 2006). Social capital theory accounts for: dual networks in terms of two types of connections are established in terms of the firm’s reputation with its peripheral partners and the firm’s trust of its core partners; structural holes networks due to the firm’s reputation with its brokered and bridged partners, but where little trust is involved; cohesive ties where trust exists among partners; and scale networks through the use of noncoercive power, “the ability and willingness of a firm to withhold resources valuable to an alliance,” acting as substitute for trust (Burt, 1992; Ireland et al., 2006: 337; Uzzi, 1997). Transaction cost economics explains the choice of: dual networks as the mix of structural holes networks and cohesive networks; structural holes networks in minimizing the costs incurred in casting a large net for diverse knowledge; cohesive ties as a transaction-cost-minimizing measure to transfer tacit knowledge via firm-specific assets; and
scale networks where codified knowledge is an observable resource similar to other property-based assets most amenable to formal governance mechanisms (Hoekter & Mellewigt, 2009; Williamson, 1971, 1975, 1994). Hence, we propose that:

**Proposition 3a.** Firms pursuing strategies of exploration that require tacit knowledge will tend to maximize their alliance portfolio value by creating and maintaining alliance portfolios containing dual networks.

**Proposition 3b.** Firms pursuing strategies of exploration that require codified knowledge will tend to maximize their alliance portfolio value by creating and maintaining alliance portfolios containing structural holes networks.

**Proposition 3c.** Firms pursuing strategies of exploitation that require tacit knowledge will tend to maximize their alliance portfolio value by creating and maintaining alliance portfolios containing cohesive ties networks.

**Proposition 3d.** Firms pursuing strategies of exploitation that require codified knowledge will tend to maximize their alliance portfolio value by creating and maintaining alliance portfolios containing scale networks.

A major external factor influencing firm alliance portfolio structure is the type of appropriability regime (Teece, 1986: 287), “the environmental factors, excluding firm and market structure, that govern an innovator’s ability to capture the profits generated by an innovation.” This impacts the firm’s alliance portfolio value depending on whether exploratory or exploitative strategies are pursued in tight or weak appropriability regimes. Tight appropriability regimes correspond to environments where intellectual property systems are strong so that patents, trade secrets and copyrights effectively protect innovators’ profits, and risk of imitation is low, whereas weak appropriability regimes occur in environments where patents and trade secrets have been ineffective in capturing innovators’ profits, conditions more favorable to interorganizational learning as knowledge spillovers, with higher risk of imitation (Cohen & Levinthal, 1990; Dushnitsky & Shaver, 2009; Teece, 1986). The increased risk of
knowledge spillovers due to weaker appropriability raises alliance (hybrid) contracting costs as compared with the firm’s coordination costs (Williamson, 1991).

When firms pursue exploration (value creation) under tight appropriability regimes, the optimal network structure is the dual network (Capaldo, 2007). The dual network meets the exploratory requirement for diverse, complementary resources obtained from the large number of peripheral members linked by weak ties, while maintaining a small core of trusted partners connected by strong ties, in an environment that minimizes the risk of unintended knowledge spillovers as well as the chances for bilateral competition (Capaldo, 2007; Lavie, 2007, 2009; Teece, 1986). (See Figure 4.)

When firms pursue exploration (value creation) under weak appropriability regimes, the risk of knowledge spillovers is much higher (Teece, 1986). The optimal alliance portfolio structure in this case would be a structural holes network characterized by bridging via weak ties to a large number of partners such that there are “cut-outs” among them so that no one partner has the “big picture” needed for bilateral competition and to minimize losses due to unintended knowledge spillovers (Burt, 1992, Lavie, 2007).

When firms pursue exploitative (value appropriation) strategies under tight appropriability regimes, there is low risk of unintended knowledge spillovers (Teece, 1986). The optimal network structure for appropriating value under these conditions is the cohesive ties network (Capaldo, 2007), involving strong ties with firms that possess similar resources and routines (Wang & Zajac, 2007). The use of multilateral competition in this structure is
unnecessary due to the interparty trust existing between network members (Inkpen & Tsang, 2005), which, in turn, is partly due to tight appropriability regimes.

When firms pursue exploitation under weak appropriability regimes, the optimal network structure is the scale network, involving weak ties with firms that possess similar resources and routines (Dussauge et al., 2000, 2004; Hennart, 1988). Since these firms are often competitors, the alliance portfolio maintains redundant members who are rivals to each other to promote multilateral competition that enhances firm alliance portfolio value appropriation (Lavie, 2007).

Organizational learning, social capital and transaction cost economics theories explain exploratory and exploitative alliance partner selection under tight and weak appropriability regimes using the same logic as they did for exploratory and exploitative alliance partner choices where the transfer of tacit and codified knowledge was involved. Hence, we assert that:

**Proposition 4a.** Firms pursuing strategies of exploration under tight appropriability regimes will tend to maximize their alliance portfolio value by employing dual networks.

**Proposition 4b.** Firms pursuing strategies of exploration under weak appropriability regimes will tend to maximize their alliance portfolio value by employing structural holes networks.

**Proposition 4c.** Firms pursuing strategies of exploitation under tight appropriability regimes will tend to maximize their alliance portfolio value by employing cohesive ties networks.

**Proposition 4d.** Firms pursuing strategies of exploitation under weak appropriability regimes will tend to maximize their alliance portfolio value by employing scale networks.

**DISCUSSION**

**Theoretical Implications**

This paper advances theory on firm alliance portfolio value creation and appropriation by identifying alliance portfolio optimal composition and structure under varying internal and external conditions. Propositions concerning alliance portfolio composition address the
questions of what kinds of partners should be included in firm alliance portfolios (Gulati, 1998) and what should be the attribute profiles of those partners (Lavie, 2007, 2009; Stuart, 2000). Under varying internal (firm size) and external (market life cycle stage) conditions, firms pursuing exploratory (value creation) strategies choose partners outside their industries that possess complementary knowledge and other resources, while firms implementing exploitative (value appropriation) strategies pick partners within their industries that possess similar knowledge and other resources. Organizational learning theory explains how firms understand their own needs, know their prospective partners’ resources, and grasp the potential impact that those prospective partners would have on the firm’s portfolio partners (Lavie, 2006). Social capital theory explains how firms can build trust with new partners by deliberately assuming vulnerable positions or demonstrating their reliability in meeting all commitments (Gulati et al., 1994). Transaction cost economics explains how firms can foresee reducing their transaction costs with new partners by employing economic hostages in their bargaining relationships (Williamson, 1985, 1996).

Alliance portfolio structure propositions suggest optimal alliance network structures in implementing alliance portfolio strategies to create and appropriate value over varying internal and external conditions. For value creation, firms pursue exploratory strategies in the form of shaping and adapting portfolio strategies (Hoffman, 2007), and choose dual networks and structural hole networks depending upon the types of knowledge and appropriability regimes involved. For value appropriation, firms follow exploitative strategies in the form of customer-supplier and collusive stabilizing portfolio strategies (Hoffmann, 2007), and choose cohesive ties networks and scale networks depending again on the types of knowledge and appropriability regimes involved. Thus, our theory holds longitudinal perspectives in alliance portfolio
development and overcomes criticism that some alliance network research has been relatively static (Gilsing et al., 2007; Lavie, 2006), deterministic (Gilsing et al., 2007; Ozcan & Eisenhardt, 2009), or has not emphasized processes that develop firm alliance portfolio management capabilities (Sarkar et al., 2009).

Firm alliance portfolio compositional and structural decisions can encompass a myriad of factors. For illustrative and space limitation reasons, the internal and external factors employed by this paper were limited in number. This portfolio compositional decision-making applies general criteria applicable in all situations as well as contingent criteria. On a contingent basis, firm alliance portfolio compositional decisions incorporate firm exploratory and exploitative business strategies, small versus large firm size, and the two main stages of the market life cycle encountered by the firm. Outputs of this decision-making are preferred alliance network member profile attributes including functional expertise, resource complementarities or similarities, and industry membership. This paper’s firm alliance portfolio structural decisions incorporate firm exploratory and exploitative business strategies for both value creation and value appropriation, the former factoring in a critical quality of a key resource, tacit and codified knowledge, and the latter including a major environmental consideration, tight versus weak regimes of appropriability. Firm alliance portfolio structural decisions produce alliance network configurations that are aligned with alliance portfolio strategies (Hoffmann, 2007).

**Empirical Implications**

When firms make decisions regarding their alliance portfolio composition and structure, those decisions are based on their own and network attributes, e.g., firm size and tacit/codified knowledge. Hence, these alliance portfolio composition and structure choices are endogenous
and self-selected, so that these empirical studies must employ Heckman’s (1979) two-step procedure to correct for correlated and heteroscedastic error terms (Shaver, 1998).

This paper’s propositions are specific enough for empirical researchers to operationalize its constructs and propositions to testable variables and hypotheses (Bacharach, 1989). Alliance portfolio compositional and structural selection decisions revolve around choices among alternatives that are close substitutes. This condition makes the independence from irrelevant alternatives (IIA) assumption implausible (Bowen & Wiersema, 2004; Cramer, 2003), thereby requiring use of discrete choice models (McFadden, 1974). Discrete choice models can handle situations where characteristics of the choosers (firms) or choices (partner attributes, network attributes) are included in explanatory variables (Bowen & Wiersema, 2004; McFadden, 1974).

Since alliance portfolio compositional and structural decision outcomes, categorical in nature, exceed two, multinomial logit modeling is required (Agresti, 2002; Bowen & Wiersema, 2004). In addition, longitudinal issues (e.g., Huber & Van de Ven, 1995; Singer & Willett, 2003) surround the study of firm alliance portfolio composition and structure, including partner selection and structural development over time (Hoffmann, 2007). In this case, multiple time periods require repeated-measures treatment, e.g., panel regression, when firm characteristics are not independent between time periods (Agresti, 2002; Allison, 1991).

**Practical Implications**

Management involved in their firms’ alliance portfolio development can readily employ this paper’s propositions. During market growth, many of the firms competing in the market are small. Small firms pursuing exploratory (value creation) business strategies during market growth should pick larger partners outside their industries that are technologically strong and possess complementary knowledge and other resources. During market maturity, many of the
participating firms are large. Large firms pursuing exploration during market maturity should select smaller partners outside their industries that are marketing dominant and possess complementary knowledge and other resources. Firms pursuing exploration (value creation) should deploy dual networks where tacit knowledge transfers are involved and tight appropriability regimes are present, and they should employ structural holes networks when codified knowledge transfers are concerned and weak appropriability regimes operate. (See Figures 1-4.)

Small firms pursuing exploitative (value appropriation) business strategies during market growth should pick larger partners inside their industries that are marketing dominant and possess similar knowledge and other resources. Large firms during market maturity should pick large partners inside their industries that are technologically strong and possess similar knowledge and other resources. Firms pursuing exploitation (value appropriation) should deploy cohesive networks when tacit knowledge transfers are involved and tight appropriability regimes exist, and they should employ scale networks to handle codified knowledge transfers and weak appropriability regimes. (See Figures 1-4.)

Limitations

Our choice of factors in the firm alliance portfolio value creation and value appropriation composition and structure decisions is limited by space constraints. The focus in firm alliance portfolio composition is on picking new members rather than evaluating existing members, so selection decisions overlook development of trust with existing partners based on repeated interactions with the firm. Alliance portfolio compositional and structural propositions employ two environmental factors, market life cycle stage and regimes of appropriability, to the exclusion of other economic, social and political factors. Also, these propositions employ knowledge as the key resource to the relative exclusion of other resource categories.
Future Research Opportunities

Research opportunities abound in two key areas. The first lies in identifying additional network member characteristics that help the firm optimize its alliance portfolio value creation and value appropriation. This paper made an initial entry into this area but there is still much to be done. This area holds a strategic position as scholars have recognized that much of the large amount of alliance network structural work was actually accounting for effects from alliance network compositional characteristics (e.g., Felin & Hesterly, 2007; Lavie, 2007, 2009; Stuart, 2000). Complementing the compositional research, structural research should exploit Hoffman’s (2007) alliance portfolio strategies approach that require different network structures under various external and internal conditions, as well as McGill and Santoro’s (2009) typology that encompasses different types of resources involved (knowledge- versus property-based) and dominant interorganizational modes (transactional versus relational).

The second major area of research opportunities lies in further development of organizational learning, social capital and transaction cost economics theories. For example, in organizational learning theory, the role of individual learners in firm alliance networks can be explored in greater detail to better grasp organizational and interorganizational learning processes. This research would complement the exploration of alliance portfolio composition in terms of network member characteristics, e.g., types of corporate cultures that promote individual and organizational learning in interorganizational settings. Also, social capital theory currently experiences a dichotomy between cohesive ties (bonding) that promote efficiency, trust, and tacit knowledge transfer, and structural holes (bridging) that supports diversity and effectiveness (Burt, 1992; Coleman, 1988; Schuller, 2007). While this paper’s alliance portfolio value creation and appropriation structural propositions have somewhat clarified this dichotomy under different
strategies and varying resource and environmental qualities, there is more opportunity to further clarify this theoretical tension. Finally, in transaction cost economics, its chief governance mode criterion is transaction cost minimization that overlooks many facets of joint value maximization and recommends transaction cost efficient governance structures to the exclusion of less efficient structures that perform better in maximizing value (Zajac & Olsen, 1993). Clearly, this shortcoming points the way for a major revision of transaction cost economics’ approach to the broad topic of value maximization, where cost is just one component of overall value.

CONCLUSION

This paper contributes to alliance portfolio value creation and value appropriation theory by developing insights on alliance portfolio composition and structure optimal configurations. This was accomplished by eschewing the more static resource-based view and embracing a more dynamic approach using an integration of organizational learning, social capital, and transaction cost economics theories. This paper highlights the boundaries of three leading organizational theories, organizational learning, social capital and transaction cost economics, by identifying their major contributions and shortcomings when applied to the alliance network context. Through their synergistic deployment, this “alliance of theories” overcomes theoretical shortcomings and builds a framework for alliance portfolio value creation and value appropriation composition and structure.

The fundamental point of this paper is that the firm holds the key to maximizing the value of its alliance portfolio by the decisions it makes regarding its alliance portfolio composition and structure. Since alliance portfolio management is a complex and challenging area, its mastery by firms will require great efforts but promises great rewards.
FOOTNOTES

1 In a convention used by other organizational scholars (e.g., Barringer & Harrison, 2000; Capaldo, 2007; Hoffmann, 2007), we use the term *alliance* to include all forms of cooperative interorganizational relationships, e.g., alliances, franchising, joint ventures, licensing.

2 A search of EBSCO Business Source Complete in August 2009 of all-time, peer-reviewed journal articles published with titles containing the word *alliance*, found 85 articles at the end of 2000. By the middle of 2009, journal articles meeting this criterion more than doubled in number to 2,056. In similar fashion, there were no articles with titles containing the phrase *alliance portfolio* at the end of 2000. By the middle of 2009, articles meeting this criterion numbered 13.

3 In August 2009, a search of EBSCO Business Source Complete of all-time, peer-reviewed journal articles published containing the words *alliance* and *portfolio* in the titles and the word *value* in the text, found 11 articles matching that criterion. Four articles had nothing to do with alliance portfolio valuation so they were excluded. Three articles, Lavie and Miller (2008), McGill and Santoro (2009), and Ozcan and Eisenhardt (2009), met the search criteria but were not listed by EBSCO, so they were included. Finally, Lavie (2006), the precursor of Lavie (2007), Lavie and Miller (2008) and Lavie (2009), was included because it met the intent of the search even though its title did not meet the search criteria. Hence, a total of 11 alliance portfolio valuation journal articles were found.
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### Table 1

**Three Theories’ Alliance Definitions and Theoretical Contributions**

<table>
<thead>
<tr>
<th><strong>Theory Name:</strong></th>
<th><strong>Organizational Learning</strong></th>
<th><strong>Social Capital</strong></th>
<th><strong>Transaction Cost Economics</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Alliance Definition</strong></td>
<td>An alliance is an interorganizational relationship, enacted by two or more firms to cope with their environments and increase their information-processing capacity, where learning is determined by alliance-, partner-, knowledge- and context-specific characteristics, and takes place intentionally or unintentionally (Cohen and Levinthal, 1990; Hamel, 1991; Lane &amp; Lubatkin, 1998).</td>
<td>An alliance is a set of social relationships between two or more firms formed to access, create and value their collective social capital (Gulati, 1998, 1999; Walker, Kogut and Shan, 1997).</td>
<td>An alliance is a hybrid governance structure between two or more firms that decide to work together over an extended time period for the purpose of creating firm and alliance value (Ireland, Hitt &amp; Vaidyanath, 2002; Reuer &amp; Ariño, 2002; Williamson, 1991).</td>
</tr>
<tr>
<td><strong>Alliance Explanation Theoretical Contributions</strong></td>
<td>- Major incentive for firms to form alliances is to learn as much as possible from their alliance partners to enhance their internal capabilities and, ultimately, their performance (Barringer &amp; Harrison, 2000; Hamel, 1991; Mowery, Oxley &amp; Silverman, 1996).</td>
<td>- Social capital is intangible aspect of firm relations that extends beyond direct relationships to other firms via reputation/legitimacy (Baker, 1990; Bradach &amp; Eccles, 1989; Burt, 1992; Podolny, 1993; Snidjers, 1999; Walker et al., 1997).</td>
<td>- Alliances are formed to minimize combined production/transaction costs, reduce uncertainty due to market failures, and decrease costs associated with hierarchies (Barringer &amp; Harrison, 2000).</td>
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<td></td>
<td>- Even if alliances established for other reasons, knowledge acquisition is often “a desirable and unintended by-product” (Inkpen &amp; Tsang, 2007: 499).</td>
<td>- Social capital is built from repeated social interaction between firms that facilitates trust and engenders learning (Schuller, 2007; Snidjers, 1999).</td>
<td>- Alliance governance structures influence mechanisms such as contracts and relational norms, used to guard against partner opportunism (Williamson, 1999).</td>
</tr>
<tr>
<td></td>
<td>- Alliance exploration emphasizes value creation through absorptive capacity, invention and innovation (Cohen &amp; Levinthal, 1990; Koza &amp; Lewin, 1998; Lane &amp; Lubatkin, 1998; Lavie &amp; Rosenkopf, 2006; March, 1991).</td>
<td>- Trust and social capital are intertwined because social capital is built from reputational effects and interaction (Gulati, 1995).</td>
<td>- Alliance network participants are far-sighted when it comes to contracting, such that alliance governance structures they established are jointly based on network member asset endowments (a form of asset specificity) and network exchange uncertainty and frequency (Williamson, 1979, 1985, 1991, 1994).</td>
</tr>
<tr>
<td></td>
<td>- Alliance exploitation emphasizes value appropriation via inertia inherent in improving existing capabilities and reducing costs (Barringer &amp; Harrison, 2000; Koza &amp; Lewin, 1998; Lavie &amp; Rosenkopf, 2006).</td>
<td>- Trust and governance can serve as both substitutes (Braddach &amp; Eccles, 1989) and complements (Poppo &amp; Zenger, 2002) to each other. As a governance substitute, trust can enable varying governance modes, while as a complement, trust can lower transaction costs where risk of opportunism exists (Gulati, 1995; Gulati &amp; Nickerson, 2008).</td>
<td>- By reducing appropriation and spillover concerns (Lavie, 2006), effective alliance network governance enables network members to focus on optimizing alliance outcomes (Zajac &amp; Olsen, 1993).</td>
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</table>
Three Theories’ Alliance Theoretical Shortcomings and Compensation by Other Two Theories

<table>
<thead>
<tr>
<th>Organizational Learning Theoretical Shortcomings and Compensation by Other Two Theories</th>
<th>Social Capital Theoretical Shortcomings and Compensation by Other Two Theories</th>
<th>Transaction Cost Economics Theoretical Shortcomings and Compensation by Other Two Theories</th>
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</thead>
<tbody>
<tr>
<td>• Learning takes place first in individuals and then migrates to groups and organizations (Crossan et al., 1999); however, the authority and hierarchy assumptions underlying organizational learning (Lee &amp; Cole, 2003) are invalid in the context of alliances.</td>
<td>• Interpersonal trust among alliance partner individuals can facilitate learning even though no authority or hierarchy exists (Nahapet &amp; Ghoshal, 1998).</td>
<td>• Hybrid contracting in the form of alliance agreements that create forms of authority and hierarchy, can facilitate learning even though no organizational authority or hierarchy exists (Williamson, 1991).</td>
</tr>
<tr>
<td>• Learning from experience means that lessons of the past are valid for the future, and organizational memory will retrieve past lessons (Haleblian &amp; Finklestein, 1999; Moorman &amp; Miner, 1997; Schein, 1992); however, in the context of alliances, the past does not portend the future, so experiential learning and memory recall are not always beneficial (Levinthal &amp; March, 1993).</td>
<td>• Repeated social interactions that facilitate trust compensates for faulty experiential learning and organizational memory recall (Nahapet &amp; Ghoshal, 1998; Yli-Renko, Autio &amp; Sapienza, 2001).</td>
<td>• Ex post governance mechanisms such as bonding with economic hostages deal with unforeseen contracting issues, e.g., contract liquidated damages (Williamson, 1985, 1996); however, such mechanisms are the products of experiential learning and memory recall and thus have limited compensating value.</td>
</tr>
<tr>
<td>• Learners (firm executives) are assumed to be target-oriented so that successful actions are repeated and unsuccessful one are avoided in the future (Levitt &amp; March, 1988; Van de Ven &amp; Polley, 1992); however, when new knowledge is encountered in the alliance context, this assumption may be invalid.</td>
<td>• Focus on alliance common benefits provides targets (Khanna, Gulati &amp; Nohria, 1998).</td>
<td>• Alliance contracts specify targets for alliance partners (Williamson, 1991).</td>
</tr>
<tr>
<td>• Firms assumed to be more efficient than markets in knowledge transfer, yet intraorganizational knowledge transfer can be sticky (Szulanski, 1996), and interfirm transfer can be even stickier (Dyer &amp; Hatch, 2006).</td>
<td>• Emphasis on relational trust can alleviate knowledge transfer stickiness (Nahapet &amp; Ghoshal, 1998; Yli-Renko et al., 2001), particularly tacit knowledge (Krishnan, Martin &amp; Noorderaven, 2006; Szulanksi, 1996).</td>
<td>• TCE has limited explanatory power in the area of knowledge transfer (Williamson, 1999).</td>
</tr>
<tr>
<td>• Learning assumed to lead to improved firm performance (Fiol &amp; Lyles, 1985; Haunschild &amp; Rhee, 2004), yet learning myopia (Levinthal &amp; March, 1993) and misleading experience (Haleblian &amp; Finklestein, 1999) can make this assumption invalid in the alliance context.</td>
<td>• Emphasis on relational norms, e.g., trust between alliance partners, can offset learning myopia and misleading experience in the presence of behavioral uncertainty but not environmental uncertainty (Gulati, 1995; Krishnan et al., 2006).</td>
<td>• Ex ante and ex post governance mechanisms that promote greater efficiency and cost-minimization are themselves the products of past learning and thus also subject to learning myopia and misleading experience (Williamson, 1975, 1985).</td>
</tr>
<tr>
<td>Social Capital Theoretical Shortcomings and Compensation by Other Two Theories</td>
<td>Organizational Learning</td>
<td>Social Capital</td>
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</tbody>
</table>
| Firms form alliances to acquire knowledge and valuable skills from partners to improve firm performance (Barringer & Harrison, 2000; Hamel, 1991; Mowery et al., 1996). | • Firms *form alliances* to acquire knowledge and valuable skills from partners to improve firm performance (Barringer & Harrison, 2000; Hamel, 1991; Mowery et al., 1996).<br>• *Cohesive ties* would be emphasized for exploitative learning needed for innovation (March, 1991; Rothaermel & Deeds, 2004). *Structural holes* would be emphasized for exploratory learning due to the diverse, heterogeneous knowledge obtained (March, 1991; Rothaermel & Deeds, 2004).<br>• Focuses on the acquisition of valuable knowledge and skills from partners that allow firms to build their capabilities and improve their performance (Barringer & Harrison, 2000; Hamel, 1991; Mowery et al., 1996).<br>• While social capital is a means for firms to engage in rent seeking and as a means for achieving a competitive advantage (Adler & Kwon, 2002; Schuller, 2007; Snijders, 1999), social conventions and expectations may limit rent seeking, as social capital is recognized by society and can be destroyed by excessive opportunistic actions by a firm (Podolny & Page, 1998). | • No explanation on initial conditions, e.g., why firms seek to *form alliances*, how they obtain their reputation, status, network position (e.g., Gulati, 1998; Nahapiet and Ghosal (1998).<br>• Networks with *cohesive ties* (Uzzi, 1997) and networks that use *structural holes* (brokerage) to claim value by bridging the gap between two parties (Burt, 1992); these competing facets of social capital are not mutually exclusive and can exist simultaneously in an alliance network. However, each has its drawbacks. Close *cohesive ties* are useful for building trust and close relationships where tacit knowledge may be exchanged but these ties can be constraining and uncompetitive (Uzzi, 1997). *Structural holes* ties are not conducive to building trust, since there is minimal interaction between firms, and especially if the alliance requires the transfer of tacit knowledge or repeated close interaction between partners (Yli-Renko et al., 2001).<br>• Focuses on transaction-cost-minimization in structuring governance structures to achieve greater efficiency and overall performance (Williamson, 1975, 1985). | • Firms *form alliances* as hybrid governance structures to handle transactions not handled effectively by either markets or firms as hierarchies (Williamson, 1991).<br>• *Cohesive ties* would be emphasized as a transaction-cost-minimizing measure to transfer tacit knowledge via firm-specific human assets (Williamson, 1971, 1975, 1994). *Structural holes* would be emphasized to minimize transaction costs associated with casting a large net for diverse knowledge (Williamson, 1971, 1975, 1994).
Table 2

Three Theories’ Alliance Theoretical Shortcomings and Compensation by Other Two Theories (Continued)

<table>
<thead>
<tr>
<th>Organizational Learning</th>
<th>Social Capital</th>
<th>Transaction Cost Economics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transaction Cost Economics Theoretical Shortcomings and Compensation by Other Two Theories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Repeated alliance ties develop relational experience between the two parties (Koka &amp; Prescott, 2002).</td>
<td>• Repeated alliance ties develop trust between the two parties (Koka &amp; Prescott, 2002).</td>
<td>• An equilibrium orientation is assumed, where exchange only occurs after two parties establish a fairness comfort level in advance (Husted &amp; Folger, 2004; Ring &amp; Van de Ven, 1994), a static view that stymies explanation of the dynamic nature of alliance relationships.</td>
</tr>
<tr>
<td>• Recurring transactions develop relational experience between the two parties (Koka &amp; Prescott, 2002).</td>
<td>• Recurring transactions develop trust between the two parties (Nahapiet &amp; Ghoshal, 1998; Yli-Renko et al., 2001).</td>
<td>• Addresses recurring transactions where two-party relationships are transformed into bilateral monopolies that promote opportunism (Williamson, 1979), but overlooks impact of favorable experience and subsequent development of trust (Heide &amp; John, 1990; Judge &amp; Dooley, 2006).</td>
</tr>
<tr>
<td>• By emphasizing knowledge and skills acquisition (Barringer &amp; Harrison, 2000; Hamel, 1991; Mowery et al., 1996), provides more organic explanation of alliance relationships.</td>
<td>• By emphasizing reputation and legitimacy (Yli-Renko et al., 2001), provides more organic explanation of alliance relationships.</td>
<td>• Emphasizes transaction cost minimization (Tsang, 2006; Williamson, 1975, 1985) and ignores other factors such as alliance joint value maximization (Gulati, 1995, 1998; Khanna et al., 1998; Nahapiet &amp; Ghoshal, 1998; Zajac &amp; Olsen, 1993), making TCE theory mechanistic (Tsang, 2006).</td>
</tr>
<tr>
<td>• Does not employ behavioral assumptions of opportunism and risk neutrality, and instead emphasizes development of relational experience (Koka &amp; Prescott, 2002).</td>
<td>• Does not employ behavioral assumptions of opportunism and risk neutrality, and instead emphasizes development of trust while minimizing risk (Krishnan et al., 2006; Yli-Renko et al., 2001).</td>
<td>• Employs questionable assumption of risk neutrality (Williamson, 1985) which is contrary to TCE theory itself that chooses governance structures that implicitly minimize risk due to asset specificity and uncertainty (Williamson, 1979).</td>
</tr>
<tr>
<td>• Assumes that learning takes place to partially mitigate future uncertainty (Huber, 1991), including both environmental and behavioral uncertainty.</td>
<td>• Reputational effects can reduce behavioral uncertainty but not environmental uncertainty (Gulati, 1998).</td>
<td>• Employs farsighted contracting which anticipates changes in bargaining power among transaction parties (Williamson, 1994), ignoring environmental and behavioral uncertainty in the alliance context (Krishnan et al., 2006).</td>
</tr>
</tbody>
</table>
Table 3
Theoretical Content Analysis of Alliance Portfolio Value Journal Articles Using Illustrative Quotations\(^a\)

<table>
<thead>
<tr>
<th>Theoretical View: Author(s) and Theoretical Framework</th>
<th>Organizational Learning</th>
<th>Social Capital</th>
<th>Transaction Cost Economics</th>
</tr>
</thead>
<tbody>
<tr>
<td>George, Zahra, Wheatley &amp; Khan (2001): Relational View and Organization Learning Theory</td>
<td>“Absorptive capacity, therefore, is expected to mediate the relationship between alliance portfolio characteristics and high technology company’s innovative and financial performance.” (206)</td>
<td>“This view posits that critical resources and value creation activities span the boundary of the firm and may be embedded in its interfirm relationships (e.g., strategic alliances).” (206-07)</td>
<td>“Firms enter multiple alliance agreements in order to overcome uncertainty and optimize risk” (209)</td>
</tr>
<tr>
<td></td>
<td>“Learning to organize and manage multiple alliances also give the high technology firm the expertise to cultivate and exploit the knowledge gained from these alliances.” (208)</td>
<td>“Grounded in trust, these relationships can enable the high technology firm to acquire new knowledge that can improve its innovative activities” (207)</td>
<td>“The way an alliance is structured and managed can induce trust and reduce opportunism, factors that can encourage the exchange of information and sharing of knowledge among partners” (210)</td>
</tr>
<tr>
<td></td>
<td>“The learning perspective also suggests that alliance characteristics affect the firm’s ability to learn from its partner” (210)</td>
<td>“Frequent interactions also induce trust, making partners more willing to exchange ideas and share sensitive information” (211)</td>
<td>“Alliance partners can improve their productivity by making relationship-specific investments in site, physical assets, and human assets (Williamson, 1985).” (213)</td>
</tr>
<tr>
<td>Bamford &amp; Ernst (2002): None (descriptive only)</td>
<td>“intangible benefits, such as opportunities for learning, access to new technologies and markets, and improved competitive positioning.” (31)</td>
<td>“cultural fit and trust between partners” (35)</td>
<td>“contractual alliance” (31)</td>
</tr>
<tr>
<td></td>
<td>[Goal:] “Increase learning of parent [firm]” (33)</td>
<td>“A company that has repeated problems with its alliances can find that its reputation (or “alliance brand”) is damaged and that it can no longer attract the best partners or maintain their trust” (37)</td>
<td>“structuring and launching a deal” (36)</td>
</tr>
<tr>
<td></td>
<td>“transferring knowledge to its partners” (35)</td>
<td>“considered less trustworthy by partners.” (37)</td>
<td>“Alliances that have the wrong deal structure” (36)</td>
</tr>
</tbody>
</table>

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</tr>
</thead>
<tbody>
<tr>
<td>Parise &amp; Casher (2003): None (descriptive only)</td>
<td>• “Leverage knowledge sharing across your alliances” (27)</td>
<td>• “a relationship beyond the letter of the contract.” (26)</td>
<td>• “We characterize a strategic alliance as an open-ended agreement between two or more organizations” (26)</td>
</tr>
<tr>
<td></td>
<td>• “partners . . . learn from each other and are willing to do so” (30)</td>
<td>• “solid alliance relationship built on trust and commitment” (29)</td>
<td>• “contract-negotiation phases of their alliances” (28)</td>
</tr>
<tr>
<td></td>
<td>• “degree to which an enterprise captures, shares, and leverages . . . knowledge across its alliance portfolio” (35)</td>
<td>• “poorly performing alliances are marked by a lack of trust” (37)</td>
<td>• “Instead of adding and removing partners opportunistically” (32)</td>
</tr>
<tr>
<td>Lavie (2006): Resource-Based View (RBV), Relational View, and Social Network Theory</td>
<td>• “Relational rents are extracted from relation-specific assets, knowledge-sharing routines, complementary resources, and effective governance mechanisms.” (645)</td>
<td>• “The prominent alliance partner can actually suffer from reputational loss when endorsing an unsuccessful start-up firm.” (645)</td>
<td>• “The establishment of an effective governance structure and the evolution of interfirm routines that facilitate the sharing of knowledge and information within the boundaries of the alliance also play a role in generating relational rents.” (642)</td>
</tr>
<tr>
<td></td>
<td>• “Relative absorptive capacity. Firms often enter alliances with the expectation of learning new knowledge and acquiring external rent-generating resources.” (645)</td>
<td>• “Since contracts are incomplete and cannot specify all future developments (Williamson, 1975), researchers have emphasized the important role that informal safeguards and trust-building initiatives play in deterring potential opportunistic behavior of alliance partners” (646)</td>
<td>• “Hence, the relational view draws not only from the RBV but also from transaction cost economics” (642)</td>
</tr>
<tr>
<td></td>
<td>• “alliance partners accumulate knowledge and skills that result in shifts in their relative bargaining power over time.” (646)</td>
<td>• “Coevolving trust and conflict resolution mechanisms can limit such leakage.” (647)</td>
<td>• “The contractual safeguards and opportunistic behavior arguments underscore the need to incorporate transaction cost economics logic (Teece, 1986; Williamson, 1975).” (646)</td>
</tr>
</tbody>
</table>

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### Table 3
Theoretical Content Analysis of Alliance Portfolio Value Journal Articles Using Illustrative Quotationsa (Continued)

<table>
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</tr>
</thead>
</table>
| Hoffmann (2007): Contingency Theory, Coevolutionary Theory and Social Network Theory | • “Both adapting and shaping strategies require exploration (March, 1991) to acquire new resources and capabilities.” (830)  
• “firms engage in both exploration and exploitation alliances, depending on their business strategy.” (834)  
• “strong ties support effective organizational learning and have a positive effect on technological performance.” (850)  
• “a firm’s alliance portfolio represents its social capital” (830)  
• “The benefits the firm accrues from its interorganizational relationships include access to additional resources and assurance of legitimacy.” (832-33)  
• “Only strong ties . . . enable a sufficiently close and trustful collaboration between companies, through which in-depth information and implicit knowledge can be shared” (834)  
• “contractual alliances with local market partners are . . . used as an explorative step in entering a new market.” (831)  
• “under conditions of low strategic uncertainty, firms prefer to exploit resources under unified control because of lower transaction costs” (833)  
• “whether they should continuously ‘optimize’ their interorganizational relationships in an opportunistic way” (850) | • “Network resources encompass partners’ tangible and intangible assets, including their human resources, financial assets, marketing efforts, R&D investments, and reputation.” (1191)  
• “resource-rich partners offer intangible assets that enhance the firm’s legitimacy and capacity to acquire additional resources” (1192)  
• “This value-creation effect is ascribed to the ability of the firm to leverage these external resources, create synergies . . . , and eventually internalize them through learning and imitation” (1206)  
• “strong or rich ties to partners promote interfirm trust and norms of reciprocity” (1203)  
• “Because of the quasi-formal nature of alliances and the inherent incompleteness of alliance agreements” (1193)  
• “dynamics of bargaining among exchange partners, may also apply in the case of alliances” (1993)  
• “An alliance portfolio featuring a high proportion of the firm’s competitors is characterized by opportunistic and co-opetitive behavior . . . disputes, and considerable risk of undesirable leakage of resources, which may lead to spillover rents” (1194) |  
| Lavie (2007): Resource-Based View and Social Network Theory |  
• “The alliance portfolio can also facilitate the accumulation of external knowledge and new skills . . . through imitation, learning, and acquisition of network resources.” (1192)  
• “facilitate the exchange of valuable knowledge and information between the firm and its partners.” (1203)  
• “This value-creation effect is ascribed to the ability of the firm to leverage these external resources, create synergies . . . , and eventually internalize them through learning and imitation” (1206)  
• “Network resources encompass partners’ tangible and intangible assets, including their human resources, financial assets, marketing efforts, R&D investments, and reputation.” (1191)  
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### Table 3

#### Theoretical Content Analysis of Alliance Portfolio Value Journal Articles Using Illustrative Quotations

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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lavie &amp; Miller (2008): Organizational Learning Theory and Internationalization Theory</td>
<td>“how firms learn to bridge national differences in their alliance portfolios” (624)</td>
<td>“shared values and goals that are needed to elicit positive attitudes, reduce coordination costs, and facilitate social exchange in alliances” (625-26)</td>
<td>“Information asymmetries may be exploited by foreign partners . . . In turn, the firm’s alliance governance costs increase and its share of alliance proceeds decreases” (625)</td>
</tr>
<tr>
<td></td>
<td>“Impediments to interorganizational learning and collaboration become exorbitant as relative absorptive capacity diminishes with increases in the cross-national differences between the firm and its foreign partners in the course of internationalization” (627)</td>
<td>“when a firm establishes alliances with foreign partners, differences in national culture and institutional environments limit familiarity, and thus impair interfirm trust” (626)</td>
<td>“the firm can more effectively govern its alliances with foreign partners by relying on interorganizational trust and informal safeguards . . . that emerge as a result of more immediate interfirm relationships” (629)</td>
</tr>
<tr>
<td></td>
<td>“learning from the firm’s accumulated partnering experience contributes to the firm’s capacity to identify partnering opportunities, develop alliance relationships, and establish relational mechanisms that involve knowledge sharing” (628)</td>
<td>“Experience with foreign partners enables the firm to learn how to identify subtle differences in foreign environments, overcome cultural distance and communication barriers, build interorganizational trust, and improve the governance of its relationships with foreign partners.” (628)</td>
<td>“literature on quasi-integration (Monteverde and Teece 1982) suggests that complementary use of alternative governance structures can mitigate opportunistic behavior, while enhancing bargaining power and flexibility.” (642n2)</td>
</tr>
<tr>
<td>Lavie (2009): Resource-Based View and Resource Dependency Theory</td>
<td>“By observing and learning the skills and the external knowledge that partners bring to the alliance, over time, the company can assimilate and accumulate these resources internally.” (30)</td>
<td>“interpersonal relationships that emerge in alliances can serve for releasing the withheld resources at some later point.” (30)</td>
<td>“To capture value, managers must leverage their bargaining power . . . with and among partners in the alliance portfolio,” (27)</td>
</tr>
<tr>
<td></td>
<td>“managers need to benchmark competing partners” (33)</td>
<td>“a company can rely on prominent partners to enhance its legitimacy and capacity to acquire additional resources or attract new employees.” (30)</td>
<td>“relative bargaining power greatly impacts the value that a company can extract from its alliance portfolio” (31)</td>
</tr>
<tr>
<td></td>
<td>“Competition still plays a role in alliances, and managers must learn how to use both cooperative and competitive practices to master competition and capture value from their alliance portfolios.” (35)</td>
<td>“the nurturing of trust between the company and its partners as well as the ability of prospective partners to impose social sanctions in case . . . company that deviates from established norms” (33)</td>
<td>“Although such overlap may lead to inefficiency and redundancy in the alliance portfolio, it can improve the company’s ability to leverage competing interests among partners and reduce the risk of opportunism on their part.” (32)</td>
</tr>
</tbody>
</table>

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</thead>
<tbody>
<tr>
<td>Ozcan &amp; Eisenhardt (2009): Resource Dependency Theory and Social Network Theory</td>
<td>“Portfolios with prominent, resource-rich, and experienced partners improve the likelihood that firms will gain the benefits of ties” (246)</td>
<td>“firms prefer ties with high-status firms because status often signals quality” (248)</td>
<td>“we defined a tie as a dyadic relationship that may or may not be based on a written contract” (251)</td>
</tr>
<tr>
<td></td>
<td>“Publishers like Starclick with ties in multiple genres learned this information early.” (265)</td>
<td>“in the case of firms with limited resources and social capital.” (249)</td>
<td>“Since ties to partners that are rivals add to a firm’s bargaining power (Lavie, 2007), relying on referrals from existing partners to form ties with their competitors is unlikely to work.” (269)</td>
</tr>
<tr>
<td></td>
<td>“Starclick learned this information (not widely available) because of its BREW ties to Qualcomm (a BREW platform developer) and BREW carriers.” (266)</td>
<td>“A key insight is that executives in firms with high-performing portfolios visualize their portfolios in the context of an entire network, not as a series of single ties.” (268)</td>
<td>“These strategies thus combine active foresight, opportunistic maneuvering, and defensive positioning.” (270)</td>
</tr>
<tr>
<td>Sarkar, Aulakh &amp; Madhok (2009): Network Resources Theory and Social Capital Theory</td>
<td>“an integration dimension involving cross-alliance knowledge transferring processes that align strategies and activities across the alliance portfolio (portfolio coordination)” (586)</td>
<td>“We draw on the intellectual legacy of network resources . . . and social capital . . . to develop our notion of alliance portfolio capital.” (585)</td>
<td>“a relational dimension related to the governance of the portfolio in a way that removes relational imperfections, such of feelings of mistrust and opportunism” (584)</td>
</tr>
<tr>
<td></td>
<td>“As the notion of absorptive capacity would indicate, some degree of overlap in knowledge and competency base is required for optimal leveraging learning from partners” (590)</td>
<td>“social capital stress linkages that on one hand give the collectivity access to resources and capabilities, while creating cohesiveness that facilitates pursuit of common goals on the other” (585)</td>
<td>“the governance dimension of alliance capability may include . . . designing communication systems, negotiating, resolving disputes, and designing contracts, among others.” (586)</td>
</tr>
<tr>
<td></td>
<td>“serving as a center of competency, enhancing organizational learning and championing alliance related initiatives within the firm, the alliance function impacts firm performance directly.” (597)</td>
<td>“partnerships characterized by relational bonds are stronger and tend to be characterized by greater bandwidth, which facilitates . . . richer and more valuable knowledge in both directions, improving the knowledge base of each.” (588)</td>
<td>“It is well established that transaction and monitoring costs are likely to increase substantially with increase in interorganizational ties (Williamson 1985).” (589)</td>
</tr>
</tbody>
</table>

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Table 3
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<tbody>
<tr>
<td>Author(s) and Theoretical Framework</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill &amp; Santoro (2009): Knowledge-Based View and Real Options-Based View</td>
<td>“The successful development and commercialization of biotechnology products require firms to manage knowledge across increasingly innovation and dispersed subfields where technology management relies heavily on the use of strategic alliances for access to complementary and supplementary knowledge, technologies and activities.” (388)</td>
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<tr>
<td></td>
<td>“A central debate in the alliance literature concerns the degree to which a firm is able to balance the need to explore and discover new knowledge resources against the requirement to exploit established know-how.” (389)</td>
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<td></td>
<td>“alliances can be valuable mechanisms for learning in the early stages of technology development.” (392)</td>
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<tr>
<td></td>
<td>“In underpinning our proposed theory and conceptual framework by using real options and knowledge management theories, we link to other relevant theories such as social capital and transaction cost economics.” (389)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>“alliances are embedded with social or relational systems, some of which are particularly important for participants in alliances that involve the transfer, combination, or creation of information that has not be codified through patents, publications, etc.” (390)</td>
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<td></td>
<td>“The second dimension of our proposed typology, dominant interorganizational mode, reflects the firm’s relative reliance on either relational investment, such as repeated partner ties, or on transaction-oriented partnering in alliance portfolios.” (391)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>“at the firm level repeated alliances between firms can signify that partners are less likely to act opportunistically, thus partner familiarity and the ongoing community of practice may result in lower transaction costs by substituting trust, or social capital, for the more formal governance mechanisms and arms length contracts that would otherwise be require to control opportunism.” (390)</td>
<td></td>
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<tr>
<td></td>
<td>“Such property-based resources are managed through alliances by relying on contractual and institutional contexts to define and enforce the property rights for the partners.” (390)</td>
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<tr>
<td></td>
<td>“Transaction-oriented partnering, in contrast, reflects the firm’s principal objective of minimizing alliance transaction costs through various contract structuring protocols such as arms-length contracts that have specific contract time horizons and embedded contract incentives.” (391)</td>
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</tbody>
</table>

Note: \(^a\)Page number(s) of quotation is listed in parentheses.
FIGURE 1
Alliance Portfolio Optimal Composition (Endogenous Factors)

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<tr>
<th>Firm Strategy</th>
<th>Exploration</th>
<th>Exploitation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small Firm</strong></td>
<td>• Larger Partner</td>
<td>• Larger Partner</td>
</tr>
<tr>
<td></td>
<td>• Technologically Strong</td>
<td>• Marketing Dominant</td>
</tr>
<tr>
<td></td>
<td>• Complementary Knowledge/Other Resources</td>
<td>• Similar Knowledge/Other Resources</td>
</tr>
<tr>
<td></td>
<td>• Outside Industry</td>
<td>• Within Industry</td>
</tr>
<tr>
<td><strong>Large Firm</strong></td>
<td>• Smaller Partner</td>
<td>• Large Partner</td>
</tr>
<tr>
<td></td>
<td>• Marketing Dominant</td>
<td>• Technologically Strong</td>
</tr>
<tr>
<td></td>
<td>• Complementary Knowledge/Other Resources</td>
<td>• Similar Knowledge/Other Resources</td>
</tr>
<tr>
<td></td>
<td>• Outside Industry</td>
<td>• Within Industry</td>
</tr>
</tbody>
</table>
FIGURE 2
Alliance Portfolio Optimal Composition (Exogenous Factors)

<table>
<thead>
<tr>
<th>Firm Strategy</th>
<th>Exploration</th>
<th>Exploitation</th>
</tr>
</thead>
</table>
| **Market Growth** | • Technologically Strong  
• Complementary Knowledge/Other Resources  
• Outside Industry | • Marketing Dominant  
• Similar Knowledge/Other Resources  
• Within Industry |
| **Market Maturity** | • Marketing Dominant  
• Complementary Knowledge/Other Resources  
• Outside Industry | • Technologically Strong  
• Similar Knowledge/Other Resources  
• Within Industry |
**FIGURE 3**  
Alliance Portfolio Optimal Structure (Endogenous Factors)

<table>
<thead>
<tr>
<th>Tacit Knowledge</th>
<th>Firm Strategy</th>
<th>Exploitation</th>
<th>Exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Networks</td>
<td></td>
<td>Cohesive Networks</td>
<td></td>
</tr>
<tr>
<td>Structural Holes Networks</td>
<td></td>
<td>Scale Networks</td>
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<tr>
<td>Codified Knowledge</td>
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</tbody>
</table>
FIGURE 4
Alliance Portfolio Optimal Structure (Exogenous Factors)

<table>
<thead>
<tr>
<th>Firm Strategy</th>
<th>Exploration</th>
<th>Exploitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tight Appropriability Regime</td>
<td>Dual Networks</td>
<td>Cohesive Networks</td>
</tr>
<tr>
<td>Weak Appropriability Regime</td>
<td>Structural Holes Networks</td>
<td>Scale Networks</td>
</tr>
</tbody>
</table>