

An Integrative Aspect for Investigating the Governance of Strategic Alliances in Technology-based Environments

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Abstract

The increasing number of strategic alliances and mostly those involving an exchange of technology components or knowledge, since the early 1980s, has motivated a growing body of research on strategic alliances. The debate on the most appropriate alliance governance mode, as critical strategic decision to be made in firm level, provided the motivation and the starting point of this thesis. The discussed PhD thesis has investigated how firms decide on the governance mode of strategic alliances formed in technology-based environments under a triple perspective; a) the cost perspective, expressed by theories such as Transaction Cost Economics, b) the resource perspective, building on arguments of Resource-based and Dynamic Capabilities-based Views of the firm, and c) the less commonly applied value perspective, introduced by Game and Real Options Theories. This paper presents the primary arguments as well as findings of my PhD research.

1. Introduction

The need for strategic partnerships between different actors of a technology-based environment is primarily imposed by the complexity of product/service offerings and the risks typically associated with innovation in such environments. Single actors cannot solely master the technological know-how needed to create sophisticated offerings, and thus resort to partnerships to increase the final product's value potential. Under such strains, several challenges for the managers of strategic technology alliances emerge.

Strategic decision making is difficult in such environments, not only because change is fast and sudden, but also because it is difficult to predict the significance of a change as it is occurring. The strategic managers of firms operating in technology-based industries face several dilemmas. Successful strategies must be responsive to changing market conditions, and therefore must assure flexibility, but successful strategies also require long-term commitment. Moreover, while innovation exploitation strategies require decisions that aim at optimizing risk management and value creation, traditional competitive strategies involve

decisions that aim at optimizing resource-allocation and cost-minimization.

Recognizing that strategic managers play a critical role in alliances, and that their role becomes more difficult under the pressure of competition and uncertainty prevailing in high-tech environments, our study aimed at exploring the mechanism through which they decide on the appropriate governance mode of their firm's alliances.

More particularly, this research addresses the strategic decision-makers' dilemma of whether to internalize the transactions with their strategic partners or not, or, in other words, whether to pursue quasi-hierarchy or quasi-market alliances. This dilemma has already been addressed by a number of traditional theoretical perspectives, such as Transaction Cost Economics (TCE), Resource-based View of the firm (RBV), Dynamic Capabilities-based View of the firm (DCV), Knowledge-based View of the firm (KBV), Game Theory (GMT) and Real Options Theory (ROT). We argue in favor of integrating a set of organizational, environmental and alliance-specific factors, the impact of which is defined and explained from the aforementioned theoretical perspectives, with the ultimate purpose of developing an integrative governance model. This integration is pursued under the concern of investigating the value, along with the resource and the cost, aspects of alliances in technology-based environments.

Discussion on alliance governance mostly concerns the common dichotomy of *equity* versus *non-equity* alliances (Gulati, 1995; Narula & Hagedoorn, 1999; Osborn & Baughn, 1990; Pangarkar & Klein, 2001; Pisano, 1989). Whereas equity alliances include joint ventures and minority equity alliances, non-equity alliances refer to all other contractual arrangements that do not involve equity exchange. Equity alliances are conceived as *quasi-hierarchies*, since they rely more on hierarchical governance mechanisms, while non-equity alliances are conceived as *quasi-markets* (Osborn & Baughn, 1990), since they rely more on arm's-length market transactions.

Figure 1 illustrates the three principal alliance governance modes, as described above, at a continuum of increasing hierarchical control and partners' degree of interdependence. At the one end we set *joint ventures*, which involve partners creating a new entity in which they share equity, and at the other end we set *contractual agreements*, alliances with no sharing of equity and only a few hierarchical controls built into them. In between, we can find *minority alliances* in which firms agree to cooperate by possessing minority equity in each other.

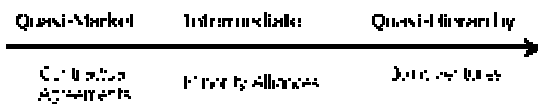


Figure 1. The three principal alliance governance modes

2. Research Background

Each of the above-specified theoretical perspectives proposes a different rationale under which firms make their decisions for the preferred governance mode. TCE stresses the need for more complex governance structures to safeguard firms against the opportunistic behavior of their partners. RBV bases the choice of alliance structure on the type and the similarity of exchanged resources. Thus, when knowledge-based and heterogeneous resources are exchanged, equity modes of alliances are preferred to assure safe conditions for the resource exchange. Under a similar rationale, DCV identifies the preferred governance structure based on the need for creation versus exploitation of new capabilities, the relative size and power of collaborators, and the levels of uncertainty and risk incurred by the exchange of knowledge. Adopting a value creation perspective, GMT and ROT view the alliance governance decision as determined by the firm expectations for the future benefits or opportunities that may arise. Contract-based agreements imply greater level of flexibility, and thus can be considered as more value-promising than equity-based alliances. However, this argument is valid only under the condition that the fear from partners' opportunistic behavior is low, and thus flexibility is of higher value than protection.

2.1. Previous Studies on Strategic Alliance Governance

Most empirical studies on alliance governance ground their arguments on Transaction Cost Economics, which proposes that choosing an appropriate alliance governance structure is an important mechanism that firms employ to protect themselves from partners' opportunistic behavior. According to them, equity forms of alliances are preferred in cases where there is a need for more protection than efficiency in partners' transactions. Instead, non-equity alliances are preferred in cases where there is a need for efficiency rather than protection, such as in industries featured by high R&D intensity (Osborn & Baughn, 1990; Hagedoorn & Narula, 1996).

Empirical work using the transaction cost logic predicts that, under conditions of high uncertainty, firms opt for more hierarchical forms of governance (Leiblein & Miller, 2003; Sutcliffe & Zaheer, 1998). However, empirical work that is consistent with real options theory shows that firms opt for less hierarchical alliances (Balakrishnan & Wernerfelt, 1986; Kogut, 1991) in a highly uncertain environment. This difference in research findings can be explained by the difference in the meaning assigned to the "uncertainty" factor. While Transaction Cost Economics addresses the endogenous uncertainty deriving from partners' behavior, Real Options Theory deals with the exogenous uncertainty, which results from changes in one or more environment-related dimensions, such as market demand, technology status, national or international regulatory framework. Nevertheless, both types of uncertainty are necessary in explaining the firms' behavior to governance issues.

Additional considerations from Resource-based View and Knowledge-based View are in support of governance forms that maintain a balance between allowing sufficiently open resource/ knowledge/ technology exchange to achieve alliance objectives, while controlling exchange flows to avoid unintended leakage of valuable resources/ knowledge/ technology (Oxley & Sampson, 2004; Colombo, 1998). Using arguments from Resource-based View, Das & Teng (2000) argue that the type of resources that firms could potentially contribute constitute a key dimension in predicting the partners' governance preferences in the prospective alliance. If one or both partners contribute knowledge-based resources to the alliance, an equity alliance mode will be preferred, since contract-based alliances do not offer sufficient protection against opportunistic behavior and unintended transfer of resources.

2.2. Research on the Value Aspect of Strategic Alliances

The great bulk of available empirical and theoretical work on alliance governance focuses on the dilemma between the cost-saving and competence-building logics, as they are expressed by TCE and RBV respectively. A more recent research stream has argued, though without providing empirical evidence, for the application of the value creation logic to the alliance governance issue (Leiblein, 2003; Ethiraj et al., 2002).

Alliances can create value in different ways depending on the growth goal that they serve. Different paths to value creation naturally affect the firm expectations for value capture, which in turn affect the ways in which alliances should be designed and managed. Thus, a first step in designing a strategic alliance is to identify the value creation logic based on the firm growth goal and its motives for entering an alliance.

Prior research has assessed value creation in inter-firm partnerships in several ways. One way is in terms of the extent to which the partnering firms' managers are satisfied with the outcome of the collaboration and are satisfied by the firms' ability to meet their strategic objectives specific to that partnership. Another measure concerns the abnormal stock market gains for the partnering firm(s) (Anand & Khanna, 2000). This last measure has also been used by Ethiraj et al. (2002) to measure the value creation of alliances in a specific instance of technology-based environments, the e-business environment. The observed marginal value creation was explained by two reasons; a) there is great uncertainty about the exact future and viability of many e-businesses, and b) alliances may be considered as necessary but not sufficient condition for competitive advantage in such hypercompetitive environments. These two reasons seem to be valid not only in the e-business but also in other emerging IT-based industries.

The key premise of this research work is that alliance governance is significantly determined by partners' expectations on the future value of the collaborative transaction. Thus, the adopted value perspective approaches the alliance governance decision in terms of value capturing capacity, which may imply a great variety of strategic benefits, including among others cost effectiveness and optimization of resources' and capabilities' potential.

This research has conceptualized the firm's expectations on alliance value capture under the

Expected Alliance Value (EAV) construct. This is defined as a multi-dimensional construct used to measure the expected benefits incurred for an organization from its participation in a strategic alliance. EAV items can also be considered as strategic motives towards alliance formation. The conceptualization of EAV includes a list of cost-economizing and strategic positioning motives, derived from the literature (Gulati & Singh, 1998; Hemphill & Vonortas, 2003; Tsang, 1998; Vilkamo & Keil, 2003).

In order to set a structure in the extended list of motives met in the strategic alliance literature, we have used Contractor & Lorange's (2002) framework for strategic contributions of cooperative arrangements. As result, we identified the following seven principal sources of strategic benefits; 1) *risk reduction*, 2) *economies of scale*, 3) *complementary resources*, 4) *co-option*, 5) *social expansion*, 6) *vertical integration*, and 7) *learning*. The only significant change from the original classification is on the replacement of the 'trade barriers' group of benefits by the more commonly met strategic motivation of 'learning' partners' exceptional capabilities through allying (Buckley & Glaister, 2002; Grant & Baden-Fuller, 2004; Steensma, 1996). The learning motivation for engaging in alliances has been a growing theme in recent literature, particularly in strategic technology alliances (e.g., Khanna et al., 1998; Contractor et al., 2002).

3. A Value Mediating Governance Model

Towards the development of a strategic decision model on alliance governance mode, Section 3.1 examines the primary influences of the alliance governance decision, which include environmental, organizational and alliance-specific factors. Section 3.2 discusses the impact of the newly introduced EAV on the governance decision. Lastly, Section 3.3 argues on the impact of the environmental, organizational and alliance-specific factors on EAV. After that, EAV is addressed as the mediating variable of the proposed conceptual model.

3.1. Prime Antecedents and their Impact on Governance

Environmental Factors

Given that strategic decisions for alliances are made in the context of a specific market, cultural and/or geographical environment, the process by which the governance preference is raised is naturally influenced by the special characteristics of this environment. There is a broad spectrum of variables

that can be included in the model for capturing the impact of the external environment, such as environment uncertainty, hostility, complexity, dynamism and predictability (Rajagopalan et al., 1993). The most important dimensions, worthy of examination in high velocity environments are *environment uncertainty* and *competition intensity*, as argued below.

Based on the Transaction Cost Theory, one of the two critical parameters on which the alliance governance preference is dependent is the uncertainty to which transactions are subject due to partners' opportunism (Williamson, 1991). Transaction Cost Economics argues in favor of more control under conditions of increased uncertainty about partners' behavior. However, uncertainty for transactions and collaborations may also derive from a number of other sources, the most well-known of which are technology uncertainty, market uncertainty and competition predictability. Technology uncertainty is of prime importance for strategic technology alliances and primarily concerns the maturity stage of the technology that partners develop or exploit. The less mature the technology employed, the more uncertainty it generates for the technology partners. Market uncertainty derives from the customers' attitude towards new technology-based products and services, while competition predictability refers to the frequency of competition shifts in the partners' industry. In markets where changes in technology are not only fast but also discontinuous, market preferences are volatile, and there are frequent shifts of relative competitive positions, the increased need for flexibility may urge firms towards market-like forms of collaboration (Hagedoorn & Narula, 1996; Osborn & Baughn, 1990; Vilkamo & Keil, 2003). This view is theoretically supported by Real Options Theory and contradicts the transaction cost-based logic.

Real options logic suggests that the critical objective of firms making governance choices under conditions of *uncertainty* is the maintenance of their flexibility. The maintenance of flexibility under conditions of high uncertainty becomes a governance issue because some forms of governance are less flexible than others (Barney & Lee, 1998). In particular, it is generally assumed that it is more costly for firms to alter hierarchical forms of governance in response to the change of the level of uncertainty in an exchange than it is to alter less hierarchical forms of governance (Kogut, 1991). Altering hierarchical forms of governance involves changing numerous explicit and implicit contracts that constitute this form of governance (Mahoney, 1992). Instead, changing less

hierarchical forms of alliances implies altering a smaller number of usually explicit contracts. This reasoning suggests that, under conditions of very high environment (i.e. technology, market, competition) uncertainty, firms will opt for quasi-market alliances.

The notion of high velocity environments is highly associated with the notion of *hypercompetition* (D'Aveni, 1994). D'Aveni argues that in such industries, the nature of competition is shifting towards a dynamic model that is based on frequent shifts in the key bases of competition, such as from product/service price to product/service characteristics to range of distribution channels and to after-sales support. Based on the TCE argumentation, high levels of competition raises the need for efficiency rather than protection. Thus, the dynamic model of competition in such markets urges firms towards more flexible, quasi-market, cooperation modes that enable them to experiment with new ideas under a low risk regime.

Organizational Factors

Strategic decision processes and outcomes are subject to a variety of organizational influences (Rajagopalan et al., 1993). Key organizational factors include structure, internal systems, current or past performance, past strategies, size, power distribution, as well as top management characteristics (Rajagopalan et al., 1993; Papadakis et al., 1998). In the context of alliance decisions, key organizational influences include firm size, age, competitive position, product diversity, financial resources, and network embeddedness. However, not all of them concern the same alliance-related decision. Some of them have an impact on the firms' propensity towards forming alliances, while others affect the decision on the governance mode.

Firm size, measured usually in number of employees, is considered of high importance in the strategic decision-making process. In the specific domain of strategic alliance decisions, the empirical evidence on firm size is far from clear or generalized. In most studies (Leiblein & Miller, 2003; Tether, 2000; Eisenhardt & Schoonhoven, 1996), firm size is used as control rather than prime independent variable of either strategy formation or governance decision. According to Grabher (1993), two main patterns of alliances can be observed: a) between large firms, which usually take the institutional form of joint ventures, and b) between large and small firms. The main incentive for large firms to enter the alliance is to gain access to new and valuable resources, while the basic incentive for small firms is to achieve economies of scale

(Alm & McKelvey, 2000). Small firms usually opt towards less hierarchical governance modes from fear of losing their autonomy, while large firms wish greater interdependence to assure better control over their partners' resources (Tether, 2000). The preference of small firms for quasi-market alliances is supported by both Resource-based View and Transaction Cost Economics. From the Resource-based View, this is due to the little resource commitment required by contractual alliances (Tsang, 1998; Chen & Chen, 2002), while from the Transaction Cost perspective the reasons is that small firms pose less risk of opportunism to their larger partners, because the dominant position of the large firms carries a natural deterrent for opportunistic behavior (Chen & Chen, 2003).

The *strategic or competitive position* of a firm can also be defined as the resource position of a firm (Day & Wensley, 1988). Sapienza et al. (1997) argue that firms owning resources of competitive advantage are more likely to enter into alliances and are more attractive alliance partners as well. Based on argumentation of Dynamic Capabilities View, we can also argue that competitive companies are more likely to opt towards quasi-hierarchy alliances, which entail higher degree of control against property leakages, in order to protect the value of their competitive resources and skills.

Strategic technology alliances' focus is often on exploitation of complementary assets for expanding in new areas (Obleros & Macdonald, 1988), as well as on saving time from product development to market exploitation (Deeds & Hill, 1996). These goals are consistent with the strategy of diversification, as well as the strategy of (vertical and horizontal) integration. Thus, alliances are usually a strategic means towards achieving the strategic goals of diversification, in either related or unrelated areas, and integration with complementors or competitors (horizontal alliances) as well as with customers or suppliers (vertical alliances).

It is reasonable that the greater the *strategies' growth level*, the higher the level of the required resource commitment, but also the higher the firms' fear of their partner's actions undermining their strategic goals. Using the Transaction Cost argumentation, the increased need for protection against behavior uncertainty leads firms towards selecting more quasi-hierarchy alliances. Moreover, based on the Resource-based and the Knowledge-based Views of the Firm, the requirement for committing and integrating a large amount of resources, a large amount of which may be knowledge-based and constitute competitive

advantage of the involved partners, point to the choice of more hierarchical governance modes in order to assure partner's commitment but also safeguard their current assets.

Alliance-Specific Factors

Even within the same external environment and between organizations of similar internal organizational characteristics, the governance preferences of an organization may still vary across alliances because of some differences in the partners' strategic, operational, technology and cultural level.

Cultural and operational compatibility among partners influence the extent to which they manage to realize the primary goal for which the alliance has been contracted, and thus raise the value they expect. On the one hand, a kind of similarity in their organizational processes and working styles may lead to a reduction of coordination costs, thus raising the quasi-hierarchy alliances as most efficient solutions. On the other hand, possible incompatibilities in social norms may even cause the failure of the alliance due to the inability of the two entities to work seamlessly and come into agreement (Wilkof et al., 1995). Under such circumstances, the risk of failure is much greater in quasi-hierarchy rather than in quasi-market alliances.

Hamel et al. (1989) suggest that, when seeking collaborators for technology-related projects, firms should target partners whose *strategic goals* converge while their competitive goals diverge. The rationale behind this prescription is that, if alliance partners are competitors in end-product markets (i.e. if their competitive goals 'converge'), then each may be so intent on internalizing the other's knowledge – and at the same time limiting access to their own proprietary skills – that the strategic goals of the alliance will be thwarted (Oxley & Sampson, 2004). This does not mean that alliances between competitors do not occur or are damned to fail. Both the Transaction Cost Economics and the Knowledge-based View perspectives provide distinct, yet overlapping, explanations for preferring quasi-hierarchy alliances in a highly competitive environment. First, TCE argues in favor of more 'protective' governance structures as joint ventures, because they provide sufficient protection to induce extensive knowledge sharing among competitors. Second, KBV and OL encourage joint ventures in competitive alliances, where a firm wishes to maintain its organizational competence, but also benefiting from another firm's current knowledge or cost advantage (Kogut, 1988).

Theoretical and empirical research has proved that *alliance history* regarding the frequency and mode of past alliances between partners are related to the continued use of a specific governance mode (Steensma, 1996). According to Gulati (1995), prior direct or indirect collaborations between partners increase trust. Based on literature about Social Exchange Theory and strategic flexibility (Young-Ybarra & Wiersema, 1999), the trust between partners has a positive impact on the desire and ability of the partners to adjust to changing environmental demands through modification of their agreement which may involve higher levels of investment. Thus, firms that currently keep a contractual agreement may mitigate to a more hierarchical governance mode, if the environment requires such a change (i.e. if the need for co-opting existing market players increases), given that they have developed trust from prior alliances. Moreover, firms persist in using a particular governance mode, because they develop skills in managing such alliances and reputation as reliable partners (Powell et al., 1996). Alliance management skills as well as reputation and trust can basically result from more hierarchical alliances, such as minority investments and joint ventures, where partners have a frequent and close contact. The more frequent the contact and the more complex the partners' collaboration, the higher the need for coordination and conflict resolution. Thus, firms may select quasi-hierarchy governance mode of alliances, due to trust resulting from prior alliances and mostly from persistence in quasi-hierarchy alliances in previous cycles of their alliance history.

3.2. Expected Alliance Value and its Impact on Governance

According to Real Options theory, the first and simplest means through which organizational governance decisions may create value is through the option to defer investment. In this research, investment is used to denote partners' contribution of both capital and resources/skills to their strategic alliances. The required investment grows as partners' governance preference scales from non-equity to equity alliances, and more specifically from contractual agreements (either relational or recurrent) to joint ventures.

When investments in alliance structures are irreversible, that is they cannot be fully recovered without incurring some considerable costs, and the future value of these investments is uncertain, Real Options Theory indicates that committing prematurely may impose considerable risks. In these situations, there is value associated with the

option of waiting for new information that might affect the desirability or timing of the investment. The ability to delay or defer an irreversible investment can thus be an important source of flexibility (McDonald & Siegel, 1986; Pindyck, 1991) and the economic value associated with this flexibility may suggest deferring investment even if the net present value associated with the project is positive. Real Options theory recognizes the expected value associated with this latter flexibility and indicates that, under uncertainty, it may be optimal to utilize market-like mechanisms that provide greater flexibility. This flexibility is desired only under conditions of low uncertainty that derives from prospective opportunistic behavior of any of the involved partners.

3.3. The mediating role of the Expected Alliance Value

This research adopts a value approach towards providing a mediating governance model. Such an approach has been proposed by Zajac & Olsen (1993) as an opportunity for future research towards providing a more efficient framework to explain the variety of inter-organizational strategies as a function of their expected value.

The theoretical proposition of this research does not discard the impact of the antecedent factors previously identified (environmental, organizational, alliance-specific). Instead, it is argued that organizational, environmental and decision-specific factors can indirectly affect the alliance governance decision through managers' expectations for the alliance value at the initiation phase. Specifically, this research contends that strategic managers' value expectations are formulated based on their organization's current status and vision, the conditions of the environment (industry, market) to which they operate, as well as their organization's relationship (compatibility and history) with the candidate partner.

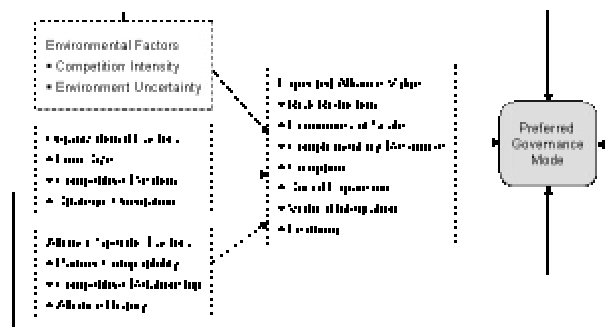


Figure 2. The Value-Mediating Governance Model

4. Research Methodology

To enable empirical testing of its theoretical propositions, this research focused on an instance of technology-based environments, namely the Greek market of wireless services. For data collection and analysis, a mixed method research methodology, involving a sequence of quantitative and qualitative techniques was employed.

At the first stage, a survey was conducted to explore the alliance governance decision-making mechanism by establishing a theoretical order of relationship/ causality among the hypothesized predictors (environmental, organizational, alliance-specific factors) and the mediating factor (EAV) of the conceptual model. The survey included collecting data on wireless alliances that operate in the Greek market. This did not necessarily mean that the participating firms - partners of these alliances – should be founded in Greece. A great number of alliances between foreign and Greek firms were also included. Nevertheless, only alliances the result of which constituted a wireless product or service provided in the Greek market, participated in the sample.

In order to fully understand the nature of wireless alliances, the required data was collected through in-person interviews with executives that were either responsible for the external business relationships (partnerships) of their company or actively participated in the corporate strategic decision making process. On the one hand, the interviews should involve open-ended questions regarding the partner firms and the motivations, nature, and impact of the partnership, so that as much information as possible was captured. On the other hand, to ensure that the required data was collected, a structured questionnaire was developed and administered during the interview. The questionnaire was structured in four sections. The first section included questions on the strategic alliance's identity (i.e. year of formation, primary purpose, governance mode, expected value for the concerned firm etc.). The second section concerned the interrogated company's profile (i.e. size, industrial sector, competitive position, alliance history). The next section included questions on the firm's perceptions for the external environment (i.e. perceived competition intensity, perceived environment uncertainty), while the last section collected data on the respondent's (strategic manager) profile.

A total of 60 questionnaires were finally coded during the data collection phase. A first checking of the data yielded 57 acceptable cases. The collected data was then analyzed with the aid of a Structural Equation Modeling (SEM) technique, namely Partial Least Squares (PLS). PLS is considered a powerful method of analysis because of the minimal demands on measurement scales (i.e. categorical to ratio level indicators can be used in the same model), sample size, and variable distributions (Wold, 1985). The PLS methodology included a set of tests for examining first the measures employed (measurement model) and then the dependence-relationships of constructs (structural model). The data analysis started with tests aiming at examining the reliability and validity of the research's measurement model. After making the required revisions and thus improving the measurement model, the analysis continued with the path model, and more specifically with the examination of the direct, indirect and total effects of the nine identified independent variables (exogenous variables) on the GOV dependent (endogenous) variable.

At a later stage, an "extreme cases analysis" approach, involving qualitative data on two particular alliances was applied in order to confirm the quantitative results.

The first case study concerned a contract-based agreement, signed in February 2005, between SIEBEN and Telenavis. SIEBEN's primary business operation involves the development of mobile applications on the Pocket PC platform. Currently, SIEBEN has developed a wide variety of mobile business operations and activities (sales, warehouse management, field service, manufacturing, etc). Telenavis leads the sector of Geographic Information Systems (GIS), providing products and services based on GPS, GSM and GPRS technologies. Telenavis provides Location Based Services (LBS) that cover a wide spectrum of business activities, ranging from the planning of a branch network to the operational requirements for optimized routing. The alliance aimed at exploiting the GPS technology. The primary objective of both companies was putting together the resources and know-how that each company possesses in each sector, in order to provide integrated mobile solutions.

The second case study concerned the establishment of a joint venture, called UNINORTEL, in July 2005, between Unisystems and Nortel Networks. Unisystems is one of the largest Greek Information Technology providers and holds the dominant position in the Greek market of Systems

Integrators. Nortel Networks operates in 150 countries worldwide. It is an international leader in the global telecommunications market, providing innovative technology solutions, including end-to-end broadband networks, Voice-over-IP solutions, multimedia services and applications, and wireless broadband networks.

Case study research required data collected from multiple sources, so that the goal of data triangulation was achieved. In this research, three data collection methods were employed; a) documentary evidence, b) interviews, c) questionnaire. The first method involved collecting and scrutinizing electronic material collected via the company or third-party (e.g. press or portal) sites. Such material included press releases on the examined alliance, company profiles, company announcements, and other information regarding the company's collaboration activities. Following the collection of documentary evidence, interviews were conducted with key managers of the investigated companies. The final stage of data collection included asking the interviewee to fill in a questionnaire with appropriate information on the examined alliance. The questionnaire was the same with the one used to collect quantitative data during the survey.

5. Research Findings

The statistical analysis of empirical data provided support for the significant influence of the six out of nine hypothesized predictors of alliance governance preference; 1) alliance history, 2) strategic orientation, 3) partner compatibility, 4) competitive relationship, 5) firm size, and 6) expected alliance value. Three of them were finally validated through the case study part of our research; alliance history, partner compatibility and firm size. Based on analysis of the empirical results, support was found that the governance decision is directly and positively affected by two firm characteristics; size, and strategic orientation, but was not significantly affected by any environment feature. This means that strategic managers drive their firms towards more quasi-hierarchy (equity-based) alliances, when their firms are large-sized and the goals of differentiation and integration become of higher importance for their firm strategic mission. Also, such forms of alliances are preferred as partners' historical relationship gets longer, their compatibility in terms of resource complementarity, cultural and operational compatibility rises, and the degree of the current competition between the two partners is low.

Grouping the exogenous factors of the conceptual model under the three prime antecedent levels (organizational, environmental, alliance specific) enabled us to make estimations about the impact of each antecedent on the firm's governance preference through an inductive logic. Hence, based on statistical analysis results on the isolated impact of each factor, it was found that the firm's governance preference is mainly determined by a number of organizational and alliance-specific influences. On the contrary, the impact of environment-specific factors proved almost negligible. This may be due to the primary assumption made, which also guided the research design, according to which all firms and alliances operate in a highly competitive and volatile environment. Hence, it was expected that no significant fluctuations would exist on the values of these two parameters in the empirical sample. Conversely, alliance-specific parameters had a significant influence on the preferred governance mode. This explains why the same firm might have different preferences for the governance mode of alliances to which it has participated, based on features of its partner and their unique bilateral relationship.

The most significant finding of our empirical investigations was that the Expected Alliance Value does not have a statistically significant mediation role in the proposed governance model. Instead, it has been proven to be a statistically significant predictor of our ultimate dependent variable, the firm's governance preference. Putting this finding in a theoretical context, we could argue that a firm's expectations for value capture constitute a significant determinant of their preference for the alliance governance mode. However, the Expected Alliance Value does not operate as mediator, and thus does not intervene between the antecedents of the governance (input) and the governance preference (output).

Although the initially proposed mediation relationship was not empirically supported, the value of the mediation model was identified in alternative ways. First, the empirical analysis of the mediation model identified three significant predictors of the Expected Alliance Value (EAV); 1) competition intensity, 2) partner compatibility, and 3) partner competitive relationship. The first two factors have a positive impact on the value of the EAV, while the third is negatively associated with it. Thus, firms' expectations from an alliance increase when partners are considered compatible in both operational and strategic terms. Moreover, these expectations seem to be higher when partners operate in a highly competitive environment, which

asks them to be efficient and innovative at the same time. Finally, value expectations may decrease significantly, thus influencing numerous strategic decisions of firms, in cases where partners are considered as competitors.

6. Conclusions and the Way Ahead

In the global information and telecommunications industry, the pace at which new technologies and products are developed and introduced is remarkably high, and product lifecycles accordingly short. As a result, several challenges for the managers of strategic technology alliances emerge. First, they have to be alert on regularly updating their business plans to include efficient business processes of technology/service innovation. Second, they should watch out to reap the benefits of firm specialization to enable short product development. Thus, strategic decisions should balance between exploration, pursued via innovation, and exploitation, pursued via combining capabilities and assets with other companies.

An emerging body of business research examines the impact of strategic managers on driving an alliance to success (Stiles, 1994; Spekman et al., 1996; 1998). The alliance manager is the person charged with carrying the alliance forward at each stage in its lifecycle. Alliance managers may play many different roles (strategic sponsor, facilitator, mediator) depending on the current life-cycle stage of the alliance. In the early stages, the alliance manager is a strategic sponsor, a combination of visionary and emissary. He is responsible for transferring the vision of the firm to a number of decisions that have to be made regarding the alliance formation and operation, such as partner selection, alliance duration, and alliance governance mode.

Recognizing that strategic managers play a critical role in alliances, and that their role becomes more difficult under the pressure of competition and uncertainty prevailing in high-tech environments, our study demonstrated that they decide on the appropriate governance mode of their prospective alliances under the following concerns:

- Taking advantage of trust developed through prior cycles of the same or other alliances with the same partner(s).
- Reaping the benefits of partner compatibility for exchanging skills and resources, and thus producing new products and knowledge.
- Exploiting their large size to invest in new ventures with smaller companies

possessing resources or skills of competitive advantage.

- Growing via pursuing product/service diversification and integration.
- Capturing value by fulfilling the strategic objectives that the firm has set at the formation stage of alliances.

The formation and management of strategic technology partnering is to a great degree affected by capabilities and tools that strategic managers possess. Our research aimed at developing a tool able of analyzing strategic managers' cognitive processes in deciding on the governance mode of their alliance. Future research efforts should be oriented towards producing those analytical and decision-aiding tools that will help strategic managers to make efficient management decisions throughout the alliance lifecycle.

7. References

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