

Transformation of High-Tech Distinctive Competencies through International Joint Ventures: A Case Study in the Saudi Petrochemical Industry

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ABSTRACT

In the present era of globalization, every business entity in developed and developing economies are relying on technology to advance its production or service processes. The technological race is revolutionizing the aspects of product or service production system even most business organizations may not typically consider high-tech operations. Although technology-oriented organizations may produce very different products or services to sustain their differentiation and leadership in the market. These organizations when developing their business model and strategies may have more emphasis to build their high-tech capacity to sustain their position in the competitive market, particularly in the Saudi-based petrochemical industry. For this purpose, Saudi-based organizations attempt to obtain high-tech distinctive competencies across their national border by using the option of international joint ventures. These choices may allow them and partner firms to take advantage of national differences in terms of cost and quality factors of production such as labor, energy, land, and capital, which permits these organizations to lower their cost structures and boost overall profitability.

KEYWORDS: generic strategies, international joint ventures, petrochemical industry

Introduction

Most multinational organizations want to expand their operations in emerging economies because of an abundance of natural resources like Saudi Arabia in the era of 1980 when the country was not as open to international expansion as it is today (Tsang, Nguyen, & Erramilli, 2004). In Saudi Arabia, these multinational firms come together with local companies to form new business entities under the name of the international joint venture in the various sector of the economy, particularly in the petrochemical industry. The Government of Saudi Arabia also encouraged this move and like other sectors allows the local petrochemical firms to avail this option to learn and transform high-tech distinctive competencies in their home ground from the foreign companies through the mode of the international joint venture (Wry, Lounsbury, & Jenni, 2014).

Since the emergence of Saudi Arabia's economy, the majority of local firms in the petrochemical industry formed international joint ventures to take advantage and transfer the high-tech distinctive competencies into their operations to improve the overall productivity of the business (Marvel, 2012). It is observed from the various published and unpublished empirical findings, despite the benefits produced by the international joint ventures in petrochemical industry over the years, they may

encounter many challenges that involve strategy (members of a joint venture may have a different strategic interest and subsequently affect the ability of collaboration), governance (both partners share the control and consequently unable to design unanimous decisions making process), organizational itself (flexible organization structure and minimize the cultural differences that exist between two partners (Oakey, 2013).

It is quite obvious; these issues lead to the poor performance of the joint ventures and impede the real purpose of both the partners (firms) particularly host firms in terms of transformation high-tech distinctive competencies. Also, the foreign firm that enters into a joint venture may not risks lenient control and not pleasantly transfer its high-tech core competencies (technology) to its partner because they think they have less advantage against their skills. This may create conflict and impact the working relationship with the host company under the agreement of joint ownership. Based on this assumption the foreign or partner firms might be reluctant to transfer high-tech distinctive competencies and intend to sustain their uniqueness (Oakey, 2013). Another reason international joint-venture partners may have different business models because of the critical problems that can arise, such as conflicts of strategic interests, how to run or control the joint venture, design



of the organizational structure, and to address cultural differences. These kinds of issues may lead to disintegration and impede the transformation of high-tech distinctive competencies in the petrochemical industry. Based on these vantage points two key questions arise in the context of highlighted challenges (*i.e.*, strategy, governance, and organization) that impede the transformation of high-tech distinctive competencies in the Saudi-based petrochemical industry.

Why are Saudi-based petrochemical organizations unable to develop consistencies between foreign (partner) firms in terms of common strategic interests, corporate governance system, organizational structure, and culture?

How do Saudi-based petrochemical organizations formulate effective business-level strategy, flexible governance systems, and adaptable organizational structure and culture to transfer and capitalize foreign (partner) high-tech distinctive competencies on their ground (home-country)?

These two interrelated questions may need to be answered in the context of the Saudi-based petrochemical industry to discover where the problem lies in terms of their strategy, governance system, and structural-cultural issues, which threaten to disintegrate the IJV and undermine the host firm's ability to transform high-tech distinctive competencies.

The next section presents the intellectual context or background and literature review that will systematically discuss the substantive (macro-level theories), theoretical (middle-range theories) and methodological (micro-level theories) perspectives of the study.

In the dynamic environment of the corporate world, several arguments were developed by different academicians, professionals, and practitioners learning through international joint ventures (IJV). The fast-changing trends of businesses and stakeholders' demands may force the organizations to become more creative and innovative. This sector of the economy strives towards the acquisition of high-tech distinctive competencies through various modes particularly through IJV (Oakey, 2013). The obvious purpose of this mode is to take advantage of the era of globalization (boundary-less world). Another good reason for the acquisition of high-tech distinctive competencies is to gain and sustain competitive advantage also to cope with environmental forces and to satisfy the expectation of stakeholders (Liu, Woywode, & Xing, 2012).

Kogut (1989) argued that learning through IJVs enhances competitiveness. In this study, he argued that

the success of the IJV is determined by knowledge transfer between IJV partners. Luo (2002) emphasized the importance of learning through the social interaction of IJV members' partner firms in the various sector of the economy. Knowledge tends to flow more freely and capabilities are developed more easily in IJVs than in wholly-owned subsidiaries (WOSs). IJVs make the possible and rapid acquisition of high-tech competencies between joint venture partners (Kogut, 1988), particularly in developed and emerging economies.

The technological paradigm shifts and competitive war among the corporate world may force them to become more dynamic and look forward to updating their production systems to improve the overall profitability. The pressure of these forces (technological shift and competitive war) is both intense and revolutionizing aspects of the product or service or production system. Although high-tech industries may produce very different products when developing a business model and strategies, which may lead to competitive advantage and superior profitability and profit growth. Being dynamic and holding high-tech distinctive competencies these organizations also open to the international joint venture (IJV) with firms that possess complementary assets or unique resources, namely, specific infrastructure, economies of labor costs, economies of scale, economies of location, encouraging attitudes of regularities of bodies, easy access to financial supermarkets and abundance of rare raw materials (Hughes, Martin, Morgan, & Robson, 2010).

An extensive review of literature revealed IJV is based on some common norms; that is, partner firms learned from the host company's knowledge of the market and country. At the same time, local firms are more inclined to learn a new way of doing business and also take leverage from their high-tech distinctive competencies (Kodama, 2014). Most commonly, business organizations form IJVs for various reasons broadly to learn from each other experiences, enter into the new market under the different business entities, make a joint investment in related or unrelated diversification to minimize the risk, and make the better use of rare resources and high-tech distinctive competencies. Vaidya (2009) identified three specific reasons for the formation of IJV and these are:

Internal benefits include risk and cost-sharing, obtaining financing, obtaining, knowledge transfer, obtaining managerial expertise.

Competitive benefits are those that create competitive strengths, including dominant market share, vertical



integration, low-cost producer status, or power derived from the market structure, such as in an oligopoly.

Strategic benefit refers to the creation and exploitation of synergies, technology transfer, and related and unrelated diversification.

These are the most common reasons business organizations form IJVs to enter into each other's ground (market) to secure their investment and minimize the risks. As mentioned earlier because of technological paradigm shift and competitive war, organizations' might be intended to take advantage to lower down the intensity of competition through these ventures. In the same zeal, Kogut(1988) contended JVs having three specific purposes:

Minimize production costs, Create a strategic advantage, and Transfer of knowledge.

An IJV might be considered one of the most appropriate choices for the firms' when it is created for the economies of scale and location, the transformation of scientific knowledge to enter into a new industry because it may allow them to share the risks and costs associated with establishing new business entity with another company. As discussed earlier, when the companies share complementary skills, assets, or distinctive competencies that may increase the probability of international joint venture success. In most cases, firms go for IJV for their strategic purposes that may include related diversification or un-related diversification of new product development and markets. They also do understand the benefits associated with this diversification without having to merge their activities into one company or bear the costs and risks of developing new products on their own (Kodama,2014). Therefore, both companies might be enjoyed the profit by enhancing the advantage of entering into a new market without having to bear any extra costs.

An extensive review of the literature indicated both partners take benefits from the IJV (Liu et al.,2012). At the same time, they may also face some serious problems that have been briefly mentioned earlier in terms of *strategic interest*, and *alignment of strategy, bendy governance system*, and *flexible structure and culture*, particularly in the Saudi-based petrochemical industry. An extensive review of the literature also indicated the severity of these issues in the contexts of IJV (Shi, Lee, & Whinston,2016). These vantage-points are also consistent with the curiosity of study at large and specific frameworks. These perspectives are carefully assessed and synthesized in the following manners: In the initial stage of IJV, both or more partners (companies) agreed to

share costs, risks, and profits from the new business entity if it succeeds. This agreement leads to creating a problem, if one partner having high-tech distinctive competency as compare to others, the partner with more valuable skills may not give away benefits or profit to others because of his more contribution to the business.

It is inevitable, as this creates a clash of interest that leads to the impact of the business-level strategy of each partner (Shi et al.,2016). Also, the strategic relationships between partners of IJV in developed or developing economies with the period may decline that might be a clear indication towards failure (Jauhiainen & Moilanen,2012). Based on these viewpoints it might be reasonable to infer the IJV partners will not sincerely cooperate and reluctant to share their rare skills or rare resources. Another significant problem among IJV partners may happen because members of the joint venture having different business models that may create the problem of governance, such as how to run the business. This is an increasingly vital issue in IJV in both developed and emerging economies. In the form of IJV, foreign investment and scientific knowledge (technology) may increase the potential of value-creating activities in the host firms' home country. The partner's firms in IJV intend to increase the intensity of efforts to improve joint ventures' governance and reduce the variation in regions and nation's supremacy of the systems (Jauhiainen & Moilanen,2012).

The difference among governance or control systems may lead to disintegration or failure of IJV (Jauhiainen & Moilanen,2012). These perspectives are also consistent with the vantage point of the study. It would be reasonable to contend the domination of one nation on IJV's governance system might be harmful strategically because the members of the joint venture have less confidence in each other and try there to control the system as much they can. That kind of attitude also creates hindrances for the transformation of high-tech distinctive competencies and rare research to each other.

From the perspective of the international joint venture, many empirical and non-empirical studies indicated organizational structure and culture is part and parcel of the firm because they truly affect the performance of the business (Kocak & Zeytinli,2009). Some other empirical evidence shows the IJV performance decline when joint ventures' strategic interest and governance system is not aligned with organizational structure and culture (Wang, 2014). Although mismatches between the strategic interest of



partners' governance system, organizational structure, and culture do occur in any different context or nation. This issue can be minimized if the management of IJV partners may act rationally when forming the structure and culture of new business entities to avoid that kind of problem in the present and future (Wang, 2014).

The foregoing discussion attempts to comprehensively present the different points of view that built around the highlighted issues (*i.e.*, strategy alignment, corporate governance systems, and organizational structure and culture) that may cause the impediments for the transformation of high-tech distinctive competencies in case of Saudi-based petrochemical industry. The study intended to explore and explain how partner firms of IJV capitalize, the advancement of technology, and rare resources of each other's to improve their business competitiveness while competing either in slow, fast, or standard-cycle markets (Das & Teng, 1996). Further, to find out how do IJV partners facilitate learning and transfer of scientific knowledge (high-tech distinctive competencies) while it creates a risk that a joint venture can lead to the unintentional leak of patent information across companies (Hughes et al., 2010). In other words, the secrecy clauses of IJV are difficult to enforce when scientific knowledge (high-tech distinctive competency and rare resources) is dispersed into the hand of a large number of employees.

These points of view may provide a good ground for the ontological assumption of the study. It is quite obvious from various perspectives in the context of IJV when a firm enters into a joint venture may have common strategic objectives and strategy alignment to achieve these goals. The consistency between strategic goals and actions to be taken to accomplish these objectives might be helpful to establish a unanimous governance system for the new business entity (joint venture). The agreed-upon supremacy of the joint venture may develop its' structure (formal reporting procedures, authority, and decision-making process) and culture (values, beliefs, and shared norms). Based on this ontological assumption the present study shows the consideration of IJV critical components (strategy alignment, governance system, and firms' structure and culture) may help to avoid the risk of giving away important, company-specific scientific knowledge (high-tech) to its partner, which might then use it to compete with its other partner in the future (Garud & Nayyar, 1994). These IJV factors may also develop confidence and trust between the partner companies of a joint venture to move further in the areas

of the business particularly in the Saudi-based petrochemical industry (Kroeze, 2011). The elements of confidence and trust of IJV partners may also remove the barriers for the transformation of high-tech distinctive competency and to exploit the rare resources in the Saudi-based petrochemical industry (Sinclair & Hamill, 2010).

In the same zeal, the relevant review of the literature indicated IJV is increasingly critical to firms particularly in emerging economies to develop competitive advantage through the experiences that are learned such as those taking place when people from partner firms work together in a joint venture (Jan Den Berghe & Guild, 2007). It might be plausible to infer from these studies one of the key advantages of joint ventures is to develop close contact between companies or ventures' partners. In other words, IJV is an optimal kind of organizational arrangement when firms need to combine their resources (*i.e.*, high-tech distinctive competencies or unique resources) to create a competitive advantage that is subsequently difficult to achieve individually in a particular economy or industry (Williamsz, 1996). More specifically, when one partner firm intends to learn high-tech distinctive competencies and transfer it to their home ground to compete in a highly uncertain environment particularly in emerging economies like the Saudi-based petrochemical industry (Williamsz, 1996).

For the discovery and advocacy of the argument, the study reviewed another strand of literature comprehensively in the area of IJV in the context of technology transformation from developed to emerging economies. These studies offered another insight into some other complex factors that influence the transformation of high-tech distinctive competencies among IJV partners (Leonard & Sensiper, 1998). They identified the complex and critical factors encountered by the IJV and these are: (a) geographical; (b) sociocultural; (c) economic; (d) government requirements and rigid policies; (e) shortage of infrastructure. Leonard and Sensiper (1998) suggested in their findings these complex and critical components are the major barriers in terms of technology transformation and to exploit rare resources between IJV partners.

In general, these studies develop the understanding of the discovery and advocacy of the argument of this study for the transformation of high-tech distinctive competencies through the mode of IJV in various sectors of the economy particularly in the Saudi-based petrochemical industry (MacDonald & Turpin, 2007). In the same zeal, Saudi Arabia has a long history and of



engaging in technology transfer arrangements to exploit new technologies, create sustainable competitive advantage in, and to maintain a dominant position in mature markets (Al-Thawwad,2008;Vaidya,2009). By considering the velocity of worldwide technological change, Saudi Arabia can either compete by investing heavily in research and development to develop its' own high-tech distinctive competencies, or leverage existing technologies using alliances, licenses, or international joint venture (IJV) arrangements (Abdul Wahab, Abdullah, Uli, & Rose, 2010).

In the present era, all kinds of business enterprises in developed and developing economies capitalizing their resources through the transformation of high-tech distinctive competencies by using various modes (MacDonald & Turpin,2007). As discussed earlier, because of globalization firms are attempting to reduce their cost and the intensity of competition prefer to form IJV to gain into new markets and take advantage of their high-tech competency (Bolívar, García, & Mihi,2011). Most of emerging economies like Saudi Arabia inclined towards IJV particularly in the petrochemical industry because of the following reasons: (a) increased efficiency manifested as better-quality products and service, lower prices, and increased domestic and international competitiveness; (b) product or service offerings in a new market, causing increased economic activity; and (c) "learning by doing", thereby creating permanent human capital gains (Al-Thawwad, 2008).

On the other hand, the developed economies are rapidly integrating technologies, products, markets, and lifestyles (Vaidya,2009). IJVs are motivated by multinational corporations (MNC) desire to: (a) enter into new markets; (b) exploit low-cost labor; (c) capture host country relationships; and (d) exploit natural resources (Abdul Wahab et al.,2010). At the same time host countries are motivated to enter IJVs for foreign direct investment (FDI), economic expansion, local employment, develop local expertise, and improve the quality of life for their citizens (Beamish & Lupton,2009). Market entry by foreign companies frequently requires a local partner with expertise in the local laws, customs, and culture to improve the probability of success (Bolívar et al.,2011).

This section of the study presents the sustentative, theoretical, and methodological perspectives that are established from a relevant review of literature in the area of critical factors like the alignment of business-level strategy, governance system, organizational structure and culture that impede the transformation high-tech from

developed and emerging economies specifically Saudi-based petrochemical industry though the mode of the international joint venture. The next section presents the central research questions which need to be answered in the form of a problem statement.

PROBLEM STATEMENT

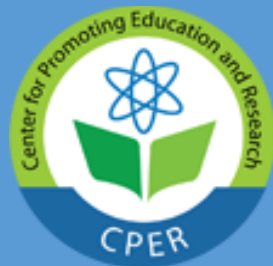
The sustentative, theoretical, and mythological perspectives of the proposed study help for the discovery and advocacy of an argument that is presented in the form proposition. This section of the study highlights the gap that exists in the current state of knowledge. More specifically, the difference between the existing and desired state in the area of the transformation of high-tech distinctive competencies through the mode of IJV from developed to developing economies like Saudi Arabia particularly in the petrochemical industry. The specific problem statement is:

"...to examine the impact of alignment of business-level strategy to develop flexible corporate governance system that establishes adaptable organizational structure and culture that facilitate the transformation of high-tech distinctive competencies and to exploit the unique resources through the mode of international joint ventures in Saudi-based petrochemical industry".

OBJECTIVES OF THE STUDY

The purpose of any research study may guide the answer to the central research question. More precisely clear objectives with appropriate methods are the basis of empirical and non-empirical studies. It is an established fact, aims should be established prior to any decisions regarding methods and the resultant data should be valid, reliable, and useful. The purpose of this study is to contribute to the development of a systematic and pragmatic approach for the transformation of high-tech distinctive competencies from developed to emerging economies through the mode of the international joint venture to exploit the rare resources in Saudi-based petrochemical industry. In contrast to most studies, which are based on anecdotal evidence, the present study is firmly empirical in orientation. The precise objectives of the study are:

-To examine the role of business-level strategy alignment to develop a flexible corporate governance system for the transformation of high-tech distinctive competencies through the mode of the international joint venture to exploit the rare resources in the Saudi-based petrochemical industry.



-To identify the flexible corporate governance system to establish adaptable organizational structure and culture for the transformation of high-tech distinctive competencies through the mode of the international joint venture to exploit the rare resources in the Saudi-based petrochemical industry.

-To examine the role of adaptable organizational structure and culture for the transformation of high-tech distinctive competencies through the mode of the international joint venture to exploit the rare resources in the Saudi-based petrochemical industry.

-To identify the cause-and-effect relationships between the key constructs of the present study (*i.e.*, alignment of business-level strategy, corporate governance system, adaptable organizational structure and culture, the transformation of high-tech competencies, the role of IJV) and to propose a theoretical framework in the context of Saudi-based petrochemical industry.

-To contribute in the area of three kinds of knowledge, namely, theory, research, policy, and practice particularly in the area of the transformation of technology through the mode of international joint ventures particularly in the context of the Saudi-based petrochemical industry.

RESEARCH QUESTIONS

Based on the problem statement and objectives, the following are the key questions:

How does the alignment of business-level strategy play a significant role to develop flexible corporate governance system for the transformation of high-tech distinctive competencies through the mode of the international joint venture to exploit the rare resources in the Saudi-based petrochemical industry?

What extent the flexible corporate governance system to establish adaptable organizational structure and culture for the transformation of high-tech distinctive competencies through the mode of the international joint venture to exploit the rare resources in the Saudi-based petrochemical industry?

How does the adaptable organizational structure and culture for the transformation of high-tech distinctive competencies through the mode of the international joint venture to exploit the rare resources in the Saudi-based petrochemical industry?

How do the cause-and-effect relationships between the key constructs of the present study (*i.e.*, alignment of business-level strategy, corporate governance system, adaptable organizational structure and culture, the transformation of high-tech competencies, the role of IJV) and

to propose a theoretical framework in the context of Saudi-based petrochemical industry?

What extent the proposed study contributes in the area of three kinds of knowledge, namely, theory, research, policy, and practice, particularly in the area of the transformation of technology through the mode of international joint ventures particularly in the context of Saudi-based petrochemical industry?

DEFINITION OF KEY TERMS

The following section presents the conceptual definitions of the main constructs of the study. These constructs theoretically defined in the context of the present study. One of the main objectives of these definitions to maintain the flow of the main argument during the write-up stage. These conceptual definitions will also provide the basis for the operational definitions of key variables. Following are the definitions of the key constructs:

The international joint venture (IJV). An IJV is an equity-based, cross-border alliance formed by two or more legally distinct organizations that are headquartered in different countries. This entity is subject to the joint control of its parent firms each of which is economically and legally independent of the other (Abdul Wahab et al., 2010).

Technology transfer. Moradian, Hessami, and Pezeshki (2010) defined technology transfer of scientific knowledge to the production system” product, service, application of a process, or for the rendering of service (p. 1045). International technology transfer flows from developed to developing countries, providing the former with a new market and the latter with access to new products at lower costs.

High-tech distinctive competency. Kozami (2005) defines high-tech distinctive competency as special ability possessed exclusively or in a large measure by a particular organization. In this sense, an organization has typical features that make it superior to its competitors. Kozami noted that distinctive competence would happen when a company had an advantage over its competitors because it was able to do something better than its competitors.

Strategic interest. White (2004) defines the concept of strategic interests as a tenet that entails a commitment or relationship between two parties or companies for mutual benefit. These interests complement the needs of the parties involved in the long-run. Companies in Saudi Arabia use strategic interests in



information Technology to establish a competitive advantage over their competitors.

Strategy alignment. According to Andolsen (2007), strategy alignment is “the link between overall organizational goals and goals of each of the units that contribute to the success of the entire corporation.” This concept is related to strategic fit which means that the internal network drivers and performance are aligned and consistent with a company’s desired financial and customer needs.

Governance of the system. This refers to actions aimed at providing prudent and sound management of business tasks or undertakings without restricting them on practicing their organizational structure as long as they have acceptable distinct duties (Solomon,2007).

Organizational structure and culture. Organizational structure refers to the way in which tasks, activities, coordination, and supervision have been organized to achieve organizational aims. This supports a clear understanding of how different subsets within the organization are related to one another (Kortmann,2012). Organizational culture refers to shared values, beliefs, and assumptions which shape how people behave and act within an organization. The organizational structure and culture are important as they support a succinct understanding of how different systems are correlated (Kortmann, 2012).

THEORETICAL FRAMEWORK

This section proposes a theoretical framework based on Porter’s (1980) model of generic strategies, as integrated into the value chain model (Porter, 1985). Within this composite model, Prahalad and Hamel’s (1990) concept of core competencies contributes additional information to demonstrate how a company’s core competencies derive logically from the Porter framework.

Generic Strategies, the Value Chain, and Core Competencies

Porter’s (1980) generic strategies identify the most basic differences among business types in terms of economics. The generic strategies, therefore, avoid the oversimplification of other strategic models of similar intent but lacking in a theoretical foundation. As an example of the latter understanding of business strategy, Kotha and Vadlamani (1995) factor-analyzed survey data on strategic choices to conclude that Mintzberg’s (1988) subtypes of differentiation constituted a superior strategic model simply because the factor analysis favored the model with the greater number of factors. Mintzberg’s (1988) strategic model, properly understood, more

correctly sought to place Porter’s generic strategies into a more comprehensive framework. Nevertheless, Mintzberg’s approach defined generic strategies in terms of structure rather than economics. It also only defined business strategy in terms of attracting customers. For Porter, the command achieved by a company over customer loyalty is only part of a broader conception that defines business strategy.

Three generic strategies distinguish three basic modes of a company’s interaction with its value chain partners in Porter’s (1980) model. They are cost leadership, differentiation, and focus. Certain principles are vital for preserving the integrity of the firms’ economic interactions with partners. For example, a firm must choose between cost leadership and differentiation. It is infeasible to achieve both for a non-focused firm because the economic models associated with the respective generic strategies conflict with one another. That is, the cost leader’s economic model posits a flat marginal-revenue curve, while that of the differentiator posits a tilted one. The cost leader, therefore, seeks to push the marginal-cost curve outward, while the differentiator seeks to tilt the marginal-revenue curve upward. For its part, the focused firm seeks a narrow monopsony position *vis-à-vis* suppliers and a narrow monopoly position *vis-à-vis* buyers.

Porter’s (1980) industry analysis model is essential for understanding these points about generic strategies. In this model, also known as the framework of the five strategic forces, Porter has depicted five focal points of economic pressure that affect the choices available to businesses in an industry. The first force is that of competitive rivalry, which has no bearing on generic strategies in that no mutually dependent relationship exists between the firm and its rivals. Supplier and buyer power represent opposite types of pressures, which create the main effect on generic strategies by creating the logic for cost leader and differentiators, respectively. Next, the threat of economic substitutes creates logic for the focused firm. The threat of new entrants in the fifth force, but no generic strategic is logically possible in this case because any action taken by a firm in the industry to oppose new entrants benefits all rivals simultaneously.

Next, Porter’s (1985) model of the value chain places both the generic strategies and the five forces of industry analysis into a single conceptual framework. Specifically, the sequence of forces, from suppliers to the company and from the company to buyers, constitutes a



value chain in its own right. Between suppliers and the company's operations, inbound logistics carry needed inputs to the firm in question. Once the firm has produced its value-added product based on those inputs, it then employs outbound logistics to take the result to the marketplace. The value chain then depicts marketing, sales, and service as the next three components. In effect, these functions take the product to the buyers in Porter's (1980) model of five forces. Thus, one sees the value chain cutting through the model of five forces from left to right. This view of the model is important for understanding how to view the core competencies.

Finally, Prahalad and Hamel's (1990) concept of core competencies shows how to use the combined model of generic strategies and the value chain to identify where in the value chain a company must dedicate its efforts to achieve the most significant competitive advantage, without inadvertently trying to achieve superiority in so many different areas of the business as to cause its strategic vision to lose clarity. Core competencies refer to those areas of strategic mastery in a company that are so hard for competitors to imitate that they practically rise to the same status as rare jewels. When one applies the concept of core competencies to the value chain, one sees that the cost leader looks upstream from its starting position of operations in the value chain, or competitive rivalry in the model of five forces, while the differentiator looks downstream. In the model of five forces, one sees supplier power upstream and buyer power downstream. The cost leader strengthens its strategic position by intensifying its mastery of the linkage between its operations and supplier operations, including inbound logistics, warehousing, and inventory management. Conversely, the differentiator strengthens its strategic position by intensifying its mastery of the linkage between its operations and the dynamics of the market, including the functions of outbound logistics, store management, marketing, sales, and service.

The focused firm achieves competitive advantage through core competencies by linking specifically defined suppliers with specifically defined buyers. It, therefore, represents a linking principle between suppliers and

buyers. In effect, the entrepreneur in charge of the focused firm specializes in securing dedicated suppliers to support its operation, which simultaneously targets dedicated buyers. The example of the retailer connected to a refueling station is a case in point. The motivation of customers is to refuel, but the convenience of the associated retailer ensures some amount of shopping there, even at a premium price. For the supplier, the opportunity to sell at a premium price, therefore, creates an incentive to enter into committed contracts with the firm. Moreover, given the focused firm's limited market size, since it is typically much smaller than that of the general industry in which it operates, the entrepreneur can secure suppliers that have similarly limited capacity and therefore would have trouble selling to larger retailers in the broader market. The core competencies of the focused firm, therefore, lie in the entrepreneur's unique strengths in linking suppliers to buyers.

Applied to international joint ventures in the Saudi petrochemical industry, the composite strategic model reveals the following. First, the IJV is a focused firm because it specifically links dedicated suppliers to a dedicated market. An IJV is a key strategic structure for entering a new market while capitalizing on high-tech distinctive competencies (Reuer, Tyler, Tong, & Wu, 2012). Firms that form an IJV typically pool their resources to create it and quickly move from the embryonic to the growth stages in the industry. This move may involve high risks and costs because the host and partner companies have to make additional investments to develop the value chain (Chadee & Kumar, 2001). In the process, they learn high-tech distinctive competencies from one another (Reuer et al. 2012). IJVs must accordingly align business-level strategies, adopt flexible governance systems, and adapt their organizational structures and cultures to accommodate the transfer of high-tech distinctive competencies to exploit resources unique to the Saudi petrochemical industry (UN Economic and Social Commission, 2001). The theoretical elements that govern the transformation of high-tech distinctive competencies through IJVs are mutually reinforcing and interdependent (Narasimhan, Rajiv, & Dutta, 2006).

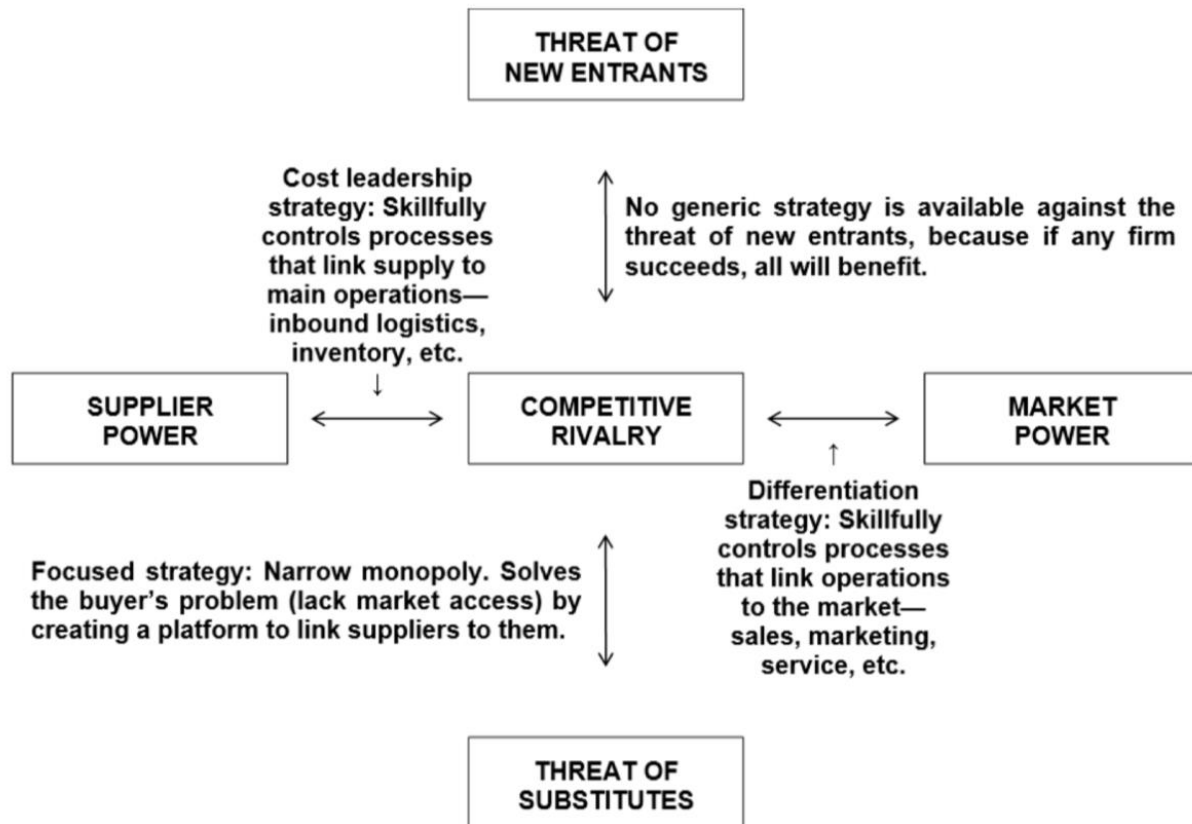


Figure 1. Theoretical framework (adapted from Porter [1980] and Porter [1985]).

Figure 1 illustrates the theoretical framework using Porter's (1980) model of generic strategies overlain on Porter's (1980) industry analysis model. The inferences regarding which value chain processes are central to each generic strategy come from Porter's (1985) value chain model. Also, Prahalad and Hamel's concept of core competencies inform how Figure 1 specifies the main area of a company's strength. For example, the cost leader tries to master all processes that link suppliers to operations.

Large, highly structured operations like petrochemical extraction tend to follow the focused firm's strategic model. This happens because strategic flexibility is low due to the sheer size and complexity of the infrastructure. Exceptions only occur at very large scales, where a concern has multiple outlets and can strategize where to build more. Nevertheless, each plant has focused characteristics, notably a narrow monopoly over its dedicated mineral sources. The same is true in petrochemical refinement. This fact causes a petrochemical firm to try to maintain tight linkages

further downstream as well. For example, if a producer of petrochemical derivatives has a dedicated relationship with a single large supplier, its logical strategy is again that of the focused firm.

The transfer of knowledge among IJV partners in the petrochemical industry is often more important than in cost leaders or differentiators because the focused firm must constantly reinforce its sources of focused strategic advantage. The core competencies of a focused firm emphasize those processes that strengthen the dependence of suppliers on the company as a conduit for special kinds of customers, as well as the dependence of customers on the company as a reliable conduit for special kinds of supplies. The key to the focused firms' strategic advantage is therefore more than merely serving a niche market. More correctly, the key is its ability to find ways to act as a platform that links suppliers and buyers.

PROPOSITIONS

The propositions that result from the foregoing theoretical discussion first address the effects of strategic



alignment, governance flexibility, and structural-cultural adaptability on the transformation of high-tech distinctive competencies in a Saudi-based petrochemical IJV. They then address the effect of the synergy among these variables, followed by the overall effect of high-tech distinctive competencies on IJV success.

Effect of Strategic Alignment

Strategic alignment refers to the similarity of global positioning between IJV partners in terms of global integration and national responsiveness. Conflicting global strategies translate into strategic uncertainty in IJV management (Makino, Chan, Isobe, & Beamish, 2007), hence the first proposition:

P.1 Strategic alignment has a positive effect on the transformation of high-tech distinctive competencies in Saudi-based petrochemical IJVs.

Effect of Governance Flexibility

Governance flexibility refers to IJV managerial freedom to adopt effective decisions despite the fact of dual ownership, hence control, between the IJV owning partners (Huang & Chiu, 2014; Roy, 2012). Excessive control of IJV decisions by the partners undermines the implementation of optimal solutions (He, Zhang, & Wang, 2015), hence the second proposition:

P.2 Governance flexibility has a positive effect on the transformation of high-tech distinctive competencies in Saudi-based petrochemical IJVs.

Effect of Structural-Cultural Adaptability

Structural-cultural adaptability refers to the IJV's freedom to adopt structural forms that harmonize the organizational cultures of the IJV partners (Peng & Beamish, 2014). Cultural conflict in the IJV produces managerial uncertainty and impedes solution implementation (Chen, Zhu, Ao, & Cai, 2013), hence the third proposition:

P.3 Structural-cultural adaptability has a positive effect on the transformation of high-tech distinctive competencies in Saudi-based petrochemical IJVs.

Synergy among Causal Variables

Synergy among the causal variables refers to the mutually reinforcing effects of strategic alignment, governance flexibility, and structural-cultural adaptability (Klijn, Reuer, Van den Bosch, & Volberda, 2013). The integrative logic of each variable must accommodate that of each other variable to create this enhancing effect (Lu & Ma, 2015), hence the fourth proposition:

P.4 Strategic alignment, governance flexibility, and structural-cultural adaptability interact positively to

transform high-tech distinctive competencies in Saudi-based petrochemical IJVs.

Effect of High-Tech Distinctive Competencies on IJV Success

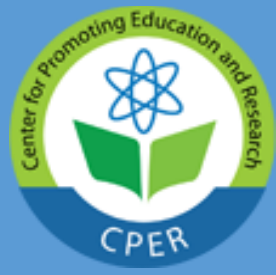
The transformation of high-tech distinctive competencies refers to the IJV's adoption and implementation of technical expertise from the IJV partners (Park, Vertinsky, & Lee, 2012). This capacity depends on the IJVs knowledge transformation capability (Nippa, Beechler, & Klossek, 2007), hence the fifth proposition:

P.5 The transformation of high-tech distinctive competencies has a positive impact on the successful performance of Saudi-based petrochemical IJVs.

DISCUSSION

As this study has argued, the examination of how high-tech distinctive competencies transform through the mode of IJV structures in Saudi petrochemical organizations suggests that the strategic advantage of the petrochemical IJV relies most heavily on the company's ability to link dedicated suppliers to dedicated consumers. The need for the petrochemical sector organizations, particularly in Saudi Arabia, is therefore to move from traditional technological systems to more dynamic systems in producing quality products (Wang & Li-Ying, 2015). It is self-evident that organizations throughout the world have expended vast sums of money and effort over the past decade while committing substantial resources to solve technological problems. Many reports and case studies have emerged on the transformation of high-tech distinctive competencies through the mode of IJVs in different contexts (Stuart & Podolny, 1996). These prior studies have shown that substantial benefits are in store as a result of the knowledge sharing through IJV structures (Lecraw, 2003).

The development of core competencies through IJV structures is an important aspect of building a competitive advantage in large petrochemical concerns, mainly due to the difficulty that exists in the effort to develop core competencies (Prahalad & Hamel, 1990). IJV structures can bring considerable resources to bear to address this challenge and can therefore uniquely enhance the competitive structure of the enterprise in ways that competitors will have trouble emulating. In the process of building core competencies in the IJV structure, however, knowledge transfer must occur. If knowledge transfer fails to occur, then no buildup of core competencies can occur, because the essence of core competencies is the success of the company at instilling in all of its workers



and managers the special intelligence, as it were, of the core competencies.

An increasingly critical focus on the transformation of high-tech distinctive competencies through the mode IJV and the need for further research is the primary justification of the proposed empirical study. No evidence has been encountered in the review of the literature herein undertaken of an empirical study ever having been attempted in Saudi-based petrochemical sector organizations. Even though theoretically a variety of different causes has been identified, empirical evidence is needed to support the role of these factors (*i.e.*, alignment of strategy, governance system, and organizational structure and culture) preventing transformation high-tech distinctive competencies efforts from achieving the intended results (Du & Levi-Minzi, 2010).

The study explores an area of significance to those who have started or might be interested in or contemplating starting to form international joint ventures to transfer high-tech distinctive core competencies in Saudi-based petrochemical sector organizations. By providing a

summary of the literature available on the area of transfer of technology in emerging economies like Saudi Arabia, the study helps demystify the transformation of high-tech competencies by using the IJV approach and provide insight into how such mode might be more successfully managed. The findings of the proposed study will contribute to the three kinds of knowledge in terms of theory, research, policy, and practices. Moreover, the results will contribute to those petrochemical sector organizations attempting to the transformation of high-tech distinctive competencies through IJV or deciding to adopt IJV mode in their organizations for the first time (Kotter, 2013).

The significance of the study is derived from the severity of the problem facing not just a few Saudi-based petrochemical sector organizations, but industries and indeed nations as a whole. There is a need to investigate the causes of that prevent the transformation of high-tech distinctive competencies under the domain of international joint venture and this need provides the rationale for this study.

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