THE EFFECT OF SOCIAL CAPITAL AND ABSORPTIVE CAPABILITY ON PRODUCT COMPETITIVE ADVANTAGE IN HIGH-TECHNOLOGY INDUSTRY

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ABSTRACT

Social capital emphasizes long-term cooperation and close customer relationships within an industrial network based on mutual trust and commitment. Such social capital predominantly facilitates knowledge spillover and exchange to reduce product innovation uncertainty in dynamic environments. The purpose of this research is to investigate the relationships among social capital, absorptive capacity, organizational competence and product competitive advantage by integrating into social capital perspectives. This study will survey several suppliers in the semiconductor and TFT-LCD industries, to investigate that how social capital efficiently enhances knowledge acquisition, knowledge assimilation and organizational responsiveness.

Keywords: Social capital theory, Absorptive capacity, Organizational competence, Competitive advantage

INTRODUCTION

Drucker [8] pointed out that knowledge productivity becomes a factor determine competitive advantage. In the Resource-Based View (RBV), competitive advantage derives from firm-level idiosyncratic resources, and firm difficult-to-imitate specific capabilities embedded in dyadic and network relationships [9, 19, 36]. In an era intense global intra-industry competition, the rising cost of technological evolution and knowledge diffusion, high-tech producers face shrinking product life cycles, as well as accelerating product development cycle times to meet market demands and customer preferences. Under the pressure of time compression, it is essential for suppliers to resort to up-to-date external market knowledge, unique technological capabilities and leverage accessible relational resources to keep pace with the desired speed of product advancement. If firms can reconfigure available resources faster than rivals to seize newly emerging market opportunities, they will be more likely to build up a stronger competitive position in fast cycling markets. Thus, superior market sensing, technology monitoring, customer linking and channel bonding capabilities all contribute to sustainable competitive advantage and better profitability [6]. Competitive advantage may also be determined by an organization's external network environment and social relationships, including customer-supplier relationships [18], inter-firm collaborations [29], industrial associations and strategic networks [11], and strategic alliances [15]. If high-tech suppliers can acquire accurate market intelligence and next

generation technology roadmaps directly from leading-technology customers, they can gain an advantage in next generation technology development. This can enable them to seize market opportunities before competitors. Beyond traditional finance-based thinking, it is of critical importance to step on correct technology trajectories by closely linking technology road mapping with market and customer expectations. Therefore, firms must invest in strong customer relationships for more than just the benefits derived from sales.

LITERATURE REVIEW

Social capital

Social capital has been already received much attention from researchers in a wide range of fields. It is typically characterized by contributions from political sciences, sociology, organizational learning theory, network and management studies involving relations inside and outside the family, relations within the firm [30, 13]. Social capital at the individual level focuses on the benefit accruing to the community. Social capital exists between individuals can be shaped by the interactions between the members of a group, organization, community, society or network. Nahapiet & Ghoshal [25] suggest that "knowledge needs to be transferred more efficiently between subunits when the managers of these subunits possess strong social interaction ties, trusting relationships development, as well as common values and norms sharing". More simply, social capital will be built up in accessible resources and flexible absorptive capabilities through the network of firms and customer relationships in order to be ready to compete in the market.

Absorptive capacity

A firm's ability to recognize and exploit technological opportunities from outside the firm has been labeled 'absorptive capacity' [4]. According to innovation theorists, a firm's capacity to transform and absorb pertinent knowledge from within the firm or from external sources represents its technological learning capacity. Product competitive advantage and successful product innovation result from reconfiguring existing resources and exploring new sources to shape functional competence that align with the high technology industry environment, then immediately develop a satisfactory product to correctly meet customer requirement. An important differentiation is made between potential absorptive capacities and realized absorptive capacity [37]. Potential absorptive capacity fosters adaptability and constant competence renewal by prompting firms to scan, interpret, and incorporate fresh insights from external sources. Although more intense acquisition and assimilation of external insights can leverage firms' future capability thresholds, they frequently clash with firms' existing knowledge and skills. Hence, firms must harmonize incongruities between internal and external information streams, overcome absorption barriers, and reduce the uncertainty typically associated with 'borrowed' knowledge. Likewise, realized absorptive capacity primarily builds on firm's accumulated internal prior knowledge base. Researches on absorptive capability draw on organizational learning of external knowledge.

Organizational competence

Market knowledge competence (MKC) should not be seen as dynamic capability in and of itself. MKC lifts market competitive value by virtue of specific organizational competencies in strategic resources deployment and reconfiguration. Technology resource deployment comprises of the level of commitment (financial resources, personnel, equipment, and facilities) or technology sourcing practices (contracts, licenses, joint ventures) used to develop a firm's technological capabilities [26]. When organizational competencies generate greater absorptive capacity to reinforce a firm's dynamic capability, a firm can seek new market opportunities to put technologies in commercial applications to end market more rapidly. A symbolic example of technological capability and reconfiguration

capabilities can be observed in the product diversification of Canon, one of the most advanced companies in “electrophotography” technology. Building on its original sophisticated optics technologies and combining them with microelectronics, Canon has successfully commercialized the electrophotography process and entered into the personal printer, fax, and copying markets. In this case, advanced electrophotography technology represents a core technological capability, and the commercialized electrophotography process represents its reconfiguration capability [14]. This example clarifies how the firm uses internal available technological resources combined with external absorbed technology knowledge to develop superior technological capabilities.

Reconfiguration capability

Pavlou & Gefen [27] defined the core principle of dynamic capabilities into a multi-dimensional construct termed resource configurability, formed by four capabilities: coordination competence, absorptive capacity, collective mind, and market orientation. Resource configurability is proposed to influence competitive advantage, applied to a new product development (NPD) context. He also evolved a proposed structural model supported by data from 180 new product development (NPD) managers, validating the proposed indirect role of IT on competitive advantage through the mediating effects of resource configurability and strategy-environment alignment. Reconfiguration capability means that firms may have access to external or internal resources, and have the ability to deploy these available resources in a manner that contributes to their firm-specific technology. Grant [10] embraces the idea of a firm's competencies being the ability to deploy resources, usually in combination, using organizational processes to achieve a desired end [23].

Technological capability

Firms rely on either internally developed technological and innovative capabilities or external technology outsourcing to obtain technological capabilities. Breeding technology internally ensures greater control over its distribution and serves to maintain firm technology appropriation, but may require far more resources than the firm is willing to commit. Conversely, acquiring technology through external sources may facilitate rapid exploitation and deployment of commercial technologies and products while gaining access to state of the art technology, but it can also undermine the need to maintain and upgrade internal capabilities. Firms must carefully weigh and balance the advantages and disadvantages of acquiring technology internally or externally to ensure the ability to compete effectively in the market. Based on relevant literature, a number of different indicators of firm technological capability has been proposed and used. These indicators include R&D expenditures and patent statistics during new product introduction.

Product competitive advantage

Recent strategic core capability theorists that intangible resources such as skills, knowledge, relationships, motivation, culture, technology and competencies are the most critical drivers of sustainable competitive advantage. Product innovation stands for innovative outputs (goods, services, technologies) that have been introduced to the market. It comprises various products that are new to the firms and significant enhancements or improvements for existing products but excludes minor modifications and/or purely aesthetic changes [1]. For the purpose of new product advantages exploration and value creation, in this study we eventually chose product quality, newness, productivity, uniqueness, and functionality as well as ease of use as measurement items of new product attributes to form a differential product advantage base using the definition of product competitive advantage from [2].

DEVELOPMENT OF RESEARCH PROPOSITIONS

In this section, the study proposes the research model (Figure 1). Each of its constructs and related

propositions as detailed below. Note that the model uses the social capital perspective in recognizing that the absorptive capacity and organizational competencies influence product competitive advantage. The following section will next develop the posited relationships and propositions.

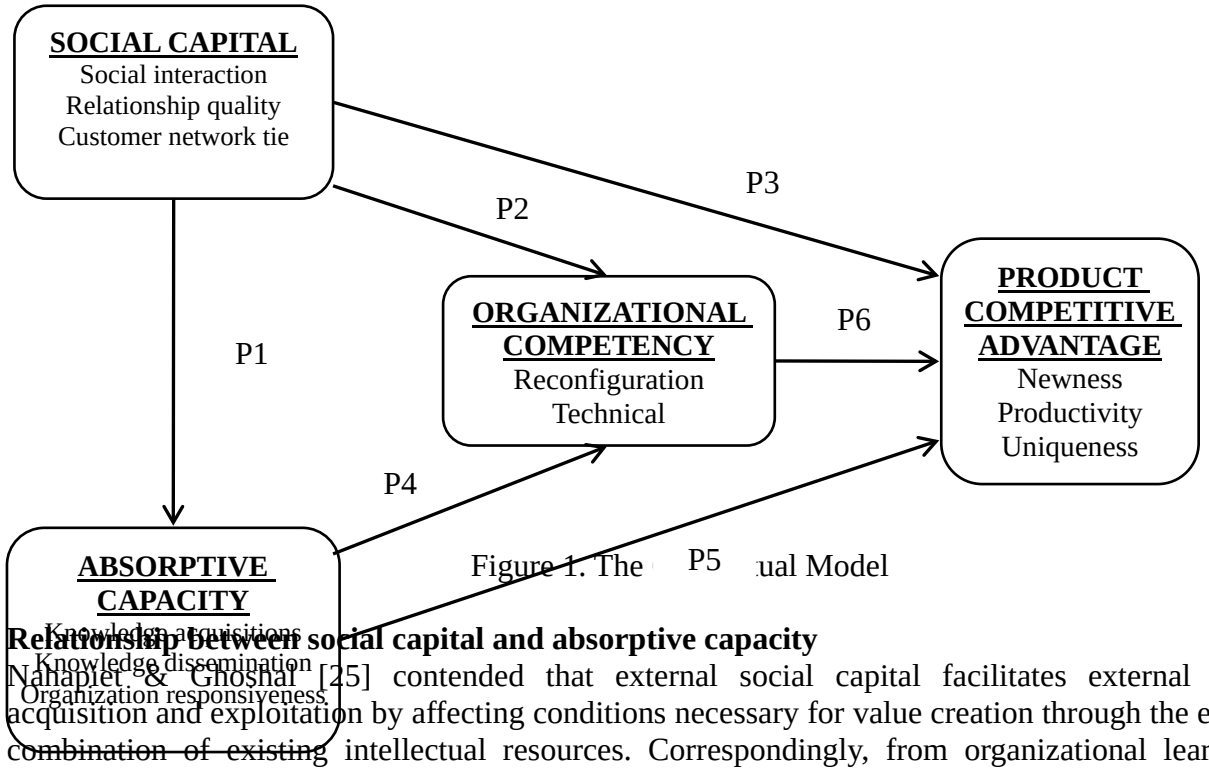

Figure 1. The ual Model

Relationship between social capital and absorptive capacity

Nahapiet & Ghoshal [25] contended that external social capital facilitates external knowledge acquisition and exploitation by affecting conditions necessary for value creation through the exchange or combination of existing intellectual resources. Correspondingly, from organizational learning view, internal social capital speeds up technological learning because it improves the efficiency of internal communication, then facilitates the evaluation of new technological information, and further improves the efficiency of technical problem-solving heuristics [35]. Several studies have investigated how firms seize learning opportunities in inter-organizational relationships between buyer-sellers, customer and entrepreneurial firms and small firms [20]. Absorptive capacity enables a firm to acquire new information externally through social interaction, internally assimilate it, and then apply it. Interfacing with the external environment is crucial for an organization's dynamic capabilities in producing new products. By intensifying the frequency, depth and breadth of information exchange, social interactions can increase specific relations and create knowledge common to them [36]. Further, close customer network ties between customers and the organization can enhance the learning capacity of individual firms. Network ties also influence the ability to acquire information [30]. The physical location of a firm may serve to enhance dynamic capabilities through facilitating communication flows. Close proximity of organizations with similar interests will promote spontaneous exchange of ideas or knowledge spillover through either formal or informal channel from customers and partners [7]. Based on the foregoing, we proposed the following proposition.

Proposition 1: Customer social capital positively affects organizational absorptive capacity.

Relationship between social capital and organizational competence

Firms constantly face the decision to either internal develop technological capability by manipulating existed available resources or to use external technology outsourcing to obtain advance technological capabilities. The latter may take place through extensive social interactions within industrial network ties. In order to stay competitive in the marketplace, companies need to develop their own technological

capability with inherent unique technological resources because they must explore customer preferences and market tendencies continuously in order to ensure that developing products meet customer expectations. In reality, outside sources of knowledge are critical to the innovation process in general Cohen & Levinthal [5] in the context of changing knowledge environments. Kogut & Zander [17] argued that a firm's innovative capabilities "rest in the organizing principles by which relationships among individuals, within and between groups, and among organizations are structured". Accordingly, innovations are the product of a firm's combinative capability to generate new applications from existing knowledge by building on the quality of social relationships between the individuals, groups and firms [32]. A firm needs fewer resources to manage existing relationships if it has more social capital [33]. Thus, the firm can make use of the remaining resources to establish new ones. Given the effect of social capital on organizational competencies (resource reconfiguration and technological capabilities) in emerging volatile markets, we proposed the following proposition.
Proposition 2: Customer social capital positively affects organizational competencies.
Proposition 3: Customer social capital positively affects product competitive advantage

The relationship between absorptive capacity and organizational competence
A big challenge to create new knowledge configurations within the firm implies that the absorption of different types of new knowledge becomes a key ability in mastering a firm's strategic management of resource integration and technology development. A widespread definition of absorptive capacity is that the firm's general ability to evaluate, and use outside knowledge for commercial ends, or its absorptive capacity [3, 5]. It enables the firm to be conscious of market opportunities and allocate resources and capabilities to appropriate the technological knowledge for product development across knowledge spillovers, and firms external to the industry absorptive capacity is of crucial strategic importance in deploying existing available resources and making progress on firm technology appropriation for product innovative activities. A close marketing-R&D interface or frequent integration of internal and external market/ technological knowledge among units allows a firm to realize its own specific technological capability more efficiently than its competitors and innovative product features desired by markets, leading to excellent product competitive advantage. One finding is the "ability to integrate knowledge across and within the boundaries of the firm is an important determinant of heterogeneous competence" which complements technological capabilities. Thus, the following proposition:
Proposition 4: Absorptive capacities positively affect organizational competencies.

Relationship between absorptive capacity and product competitive advantage
Competitiveness in product development refers to a firm's ability to develop new products that create customer value more effectively and efficiently than competitors [21]. A firm cannot create, sustain, and renew its competitive advantage without the relentless pursuit of the exploitation and use of knowledge. A firm must continually endeavor to acquire new pertinent knowledge and integrate it into its existing knowledge base. The purpose is to acquire new knowledge and incorporate that knowledge into its existing market knowledge base to increase the possibilities for determining new product solutions through market knowledge processing. Moreover, firms must be able to create knowledge and be open to new ideas from outside as well [34]. Knowledge acquisition capabilities give them a basis to develop competitive advantage [37]. Organizational responsiveness for customer complaints or customer response capability, in this regard, can be considered as a core ability that provides firms with an approach and means to achieve a more loyal and sustainable customer base. Thus, customer response speed is likely to enhance or improve the performance of an organization because a quick response to a customer need may provide a firm with first-mover advantage. This is so because they will be especially well placed to take advantage of all possible sources of know-how, whether internal or external. Consequently, we proposed the following proposition.

Proposition 5: Organizational absorptive capacities positively affect product competitive advantage.

Relationship between organizational competence and product competitive advantage

A product innovation is a new technology (from tacit knowledge to explicit knowledge) or combination of technologies (from explicit knowledge to explicit knowledge) introduced commercially to meet market need [34]. From resource-based perspective, a key to a company's success is its ability to find or create a distinctive competence [28]. Idiosyncratic complementary resource combinations or reconfiguration within firm can create sustainable competitive advantage because of idiosyncratic nature and embeddedness of the central firm's relational assets make imitation difficult. Basically, in a competitive environment, firms should, to a large extent, focus on internally reconfiguring existing resources that comprise knowledge and capabilities relevant to products, services, production and markets. Reconfiguration of existing resources by a firm will lead to new resource configurations that serve as a platform for producing both adapted and new product-market combinations. Rather, new resources are often the product of a firm's combinative capabilities to generate new applications from existing knowledge [16]. Several studies confirm the positive associations between technological assets and competitive advantage in different industries, such as the pharmaceutical, automobile, and film industries [24]. Henderson & Cockburn [12] found that a firm's previous or cumulative product success increased the likelihood of its future product success and explained a substantial portion of the variance in heterogeneity across firms. In sum, Studies tend to suggest a positive relationship between ownership of technological assets and firm performance. Accordingly, we proposed the following proposition.

Proposition 6: Organizational competencies positively affect product competitive advantage.

CONCLUSIONS AND CONTRIBUTIONS

Conclusions are presented in this section. Motivated by the above discussion, the objectives of this study have been to identify the interrelationships between social capital, absorptive capacity, organizational competence, and product competitive advantage in order to verify the influence of key research constructs on product competitive advantage. The first conclusion is associated with the six proposed product competitive advantages including newness, productivity, quality, uniqueness, ease of use and functionality[22]. Product competitive advantage defined by the three remaining items, newness, productivity and unique features, is consistent with original popular definitions of product competitive advantage derived from the fundamental propositions of the Resource-Based View (RBV).Drawing from the proposed conceptual model shown in Figure 1, the second conclusion is that there are significantly positive path and direct relationships from customer social capital to absorptive capacity, from absorptive capacity to organizational competence and from organizational competence to product competitive advantage. In this view, there is a stronger, more significant relationship between social capital and absorptive capacity than between social capital and organizational competencies, based on the literature and the authors' inferences. The results of this study are consistent with the argument of Tyler [31] for the relationship between absorptive capacity and organizational competence. Moreover, they are also consistent with the propositions of the relationship from social capital to absorptive capacity, but are somewhat inconsistent with the analytical results of Yli-Renko ey al., [35] for "*relation quality is negatively related to knowledge acquisition*". The top management team may play the most important role in dynamic capability.

References are available upon request