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# The effects of market orientation, technological opportunism, and e-business adoption on performance: A moderated mediation analysis

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ABSTRACT

Understanding the effective adoption of technological innovations, such as e-business, is arguably one of the key challenges facing organizations. The literature indicates that the relationship between firm capabilities and firm performance is mediated by the effects of the adopted innovation (e.g., e-business). However, the complementarity effects of capabilities on the adoption of innovation have received little attention. Drawing on the Resource Based View, this paper examines the complementarity between two firm-specific capabilities [i.e., Market Orientation (MO) and Technological Opportunism (TO)] with regard to e-business adoption (EBA) as well as the mediating effect of EBA on the capability-performance relationship. A moderated mediation analysis revealed that the relationship between MO and EBA is moderated by TO and that EBA partially mediates the effects of MO and TO on firm performance. Implications for theory and practice are discussed regarding bundling capabilities and subsequent complementarity to increase causal ambiguity in order to increase both EBA and firm performance.
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## 1. Introduction

Facilitating business processes through e-business technologies has been highlighted (e.g., Achrol and Kotler, 1999; Rapp et al., 2008) as a critical challenge for all industries and all firms. In fact, the critical question is not whether firms should adopt e-business but how they should deploy e-business to obtain competitive advantage (Porter, 2001). Furthermore, due to the high failure rates in the adoption and implementation of high technological innovations (e.g., Mohr and Shooshtari, 2003), understanding the adoption of technological innovations, such as e-business, is arguably one of the key concerns and challenges in marketing practice (Hauser et al., 2006; McCole and Ramsey, 2005; Hernandez et al., 2009; Trainor et al., 2011). The literature (e.g., Augosto and Coelho, 2009; Hurley and Hult, 1998; Hult et al., 2004; Montealegre, 2002; Narver et al., 2000; Rapp et al., 2008; Srinivasan et al., 2002; Tuominen et al., 2004; Wu et al., 2003) indicates a positive relationship between firm capabilities and the adoption of innovation, including the adoption of e-business technologies. Furthermore, the mediating effects of adopting innovations on the relationship between firm-specific capabilities and firm performance have been examined. For example, Hult et al. (2004) show that innovativeness defined as the capacity to introduce new process, products or ideas, mediates the effects of firm capabilities such as market orientation and organizational learning on business performance. Whilst, Naidoo (2010) illustrates that marketing innovation mediates the market orientation and competitive advantage relationship.

In the context of e-business adoption, Wu et al. (2003) discuss the mediating effects of e-business adoption between organizational learning, customer and competitor orientation and various firm performance outcomes. However, the complementarity between firm capabilities has received little attention and has been considered only with regards to variables such as firm performance (e.g., Menguc and Auh, 2006). Crucially, the complementarity between firm capabilities on a mediator (e.g., e-business adoption) of the capability-performance relationship has not been examined.

A central tenet of the RBV is that firm capabilities interact with each other. That is, the value of a capability depends on other capabilities (Moorman and Slotegraaf, 1999) due partly to resource uniqueness attained from the reconfiguration and integration of existing capabilities, thereby giving rise to causal ambiguity and subsequently to sustainable competitive advantage (Powell et al., 2006). Consequently, managers are challenged to appropriately allocate resources and to build those capabilities (and address weaknesses) that will deliver value to customers manifesting in superior firm performance as measured by both market-based

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(e.g., market share, customer satisfaction, and customer retention) and financial-based outcomes (e.g., return on investment, shareholder wealth) (Sarkees, 2011; Sirmon et al., 2011).

Capabilities can complement each other, such that the interactions enhance firm performance more than the individual contribution of each capability. For example, Moorman and Slotegraaf (1999) in the new product development literature argue that effective product development is due to a firm possessing both product marketing and product technological capabilities and the resulting complementarity of both these capabilities. Therefore, when capabilities are complementary, a capability may be difficult to develop, not due to its own initial level but due to its complementarity with other capabilities (Dierickx and Cool, 1989). Essentially, complementarity is critical to the firm because the interaction effects of capabilities enhance both effectiveness and efficiency (Park and Zaltman, 1987; Song et al., 2005), and makes imitation difficult due to causal ambiguity (Menguc and Auh, 2006). There have been calls in the literature (e.g., Moorman and Slotegraaf (1999); Song et al., 2005) for examining the complementary effects of marketing and technological capabilities as they are arguably two of the most important determinants of firm performance (Dutta et al., 1999). In the specific context of market orientation and technological opportunism, Srinivasan et al. (2002) call for research to investigate the complementarity of these two capabilities on various firm outcomes. However, in spite of the central importance accorded to complementary resources and capabilities in creation and internal appropriation of economic rents, strategic theories of the firm have tended to under-emphasize their crucial integrative role in explaining competitive advantage (Stieglitz and Heine, 2007). Existing methodologies focus on separately measuring both sets of capabilities (their main effects), and usually neglect the synergies between these complementary capabilities (their interaction effects) which can play a crucial role in the innovation process and augment firm performance (Prasnikar et al., 2008).

This paper applies the RBV to examine the complementarity effects of marketing and technological capabilities (i.e., MO and TO) on a potential mediator (i.e., EBA) of the capabilities-performance relationship. Market orientation is of central interest as it is the cornerstone of marketing strategy, and there remains an ongoing debate regarding its role in innovation (e.g., Hurley and Hult, 1998). Technological opportunism is of interest as it is a key factor in the EBA context given that it refers to sensing and responding to technological developments. To this end, the contribution that this paper makes is twofold:

(1) It contributes to the RBV literature by examining whether firm capabilities have complementary effects on a potential mediator (i.e., e-business) of the capabilities-performance relationship, and;
(2) It contributes to the market orientation literature by providing a moderation-mediation analysis of the effects of MO, TO, and EBA on firm performance.

## 2. Theoretical framework

### 2.1. The resource based view of the firm

The RBV has become the dominant theoretical foundation in strategic management (Newbert, 2007; Stieglitz and Heine, 2007) and has been applied to strategic marketing (e.g., Day, 1994; Morgan et al., 2006; Voola and O'Cass, 2010; Zahay and Peltier, 2008). According to Barney et al. (2011), the RBV originated from evolutionary economics, particularly from the work of the economist Penrose (1959), who argued that "services yielded by resources are a function of the way in which they are used – exactly the same resource when used for different purposes or in different ways and in combination with different types or amounts of other resources provides a different service or set of services" (p. 25). Penrose's (1959) argument suggests that the uniqueness of the organization is based on the way in which the organization bundles its resources and capabilities. Essentially, the RBV attempts to answer the following question: What types of organizational capabilities lead to sustainable competitive advantage?

Scholars have used terms such as resources, capabilities, competencies, skills and assets (Carmeli, 2004) when investigating the RBV. In this paper, Makadok's (2001) perspective will be adopted as the theoretical underpinning of the study. Makadok (2001) argues that a resource is an asset (e.g., brand, license or a patent) that can be observed (although it is not necessarily tangible), valued and traded. In contrast, a capability is an asset that cannot be observed, and consequently is intangible or valued and is traded only in its entirety. Essentially, capabilities alter resources by integrating and recombining them (Eisenhardt and Martin, 2000). For a capability to yield a sustainable competitive advantage it must be imperfectly imitable (King and Zeithaml, 2001).

A key mechanism that protects capabilities from imitation is that of causal ambiguity or the ambiguity concerning the connections between actions and results (Barney, 1991). Furthermore, complementarity, which refers to the marginal return of an activity increasing when it is used with another activity, is a crucial concept in strategy, particularly with regard to causal ambiguity (Milgrom and Roberts, 1995). Complementarity is essential for synergy to develop among complementary capabilities (Stieglitz and Heine, 2007). Ignoring complementarities may lead to a decrease in firm profitability, as the firm fails to realize its full potential due partly to organizational slack (Stieglitz and Heine, 2007). It is arguably the case that the interaction between capabilities that are characterized by high tacitness, complexity, firm specificity and complementarity lead to causal ambiguity, and therefore, to higher firm performance.

### 2.2. Marketing and technological capabilities

Over the past two decades, scholarly research focusing on marketing and technological capabilities has been advanced within strategic marketing and related disciplines. It is now understood in the marketing literature that a firm with a higher level of a marketing capability than its competitors has a better understanding of the needs and behaviours of its customers, and thus can develop a more effective marketing strategy which consequently enables the firm to perform better than its competitors. Furthermore, Krasnikov and Jaychandran (2008, p. 3) argue that marketing capability is "likely to be immune to competitive imitation and acquisition because of the distributed, tacit, and private nature of the underlying knowledge."

With the advent of new information technologies in the past decade, the role of technology itself can no longer be viewed myopically as a facilitator of a firm's processes, but rather, need to be seen as a core element of a firm's strategy (Srinivasan et al., 2002). Technological capability has been argued to be a strategic capability as it enables firms to achieve competitive advantage (Tsai, 2004). Specifically, competitive advantage depends upon the firm's capability to adopt new technologies in a strategic and timely manner (e.g., Lee and Grewal, 2004; Porter, 2001).

In this sense, firms that are technologically opportunistic are utilizing their resources to actively scan markets, often beyond those in which their products compete, for disruptive discoveries that will change the way firms do business (Srinivasan et al., 2002). Managers in these firms actively seek information, knowledge, signals, trends and other indicators that can create market advantages. Firms sense these disruptions through investments in resources, day-to-day activities, and formal and informal

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