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Information Technology Resources, Innovativeness, and Supply Chain Capabilities as Drivers of Business Performance: A Retrospective and Future Research Directions

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Abstract

Four articles considered among the *Industrial Marketing Management* citation classics developed frameworks that aimed to capture the factors contributing to the business performance of a firm. In this paper, we provide an overview of the developments in the field since their publication more than ten years ago and explore avenues for future research. First, we provide a retrospective on the original articles and provide a brief literature review regarding how the business performance research has evolved since then. Second, we identify potential research gaps and provide future research directions with respect to resources and capabilities that drive performance. Finally, we provide our perspective regarding other factors that could influence firm performance and other firm performance measures that should be considered by future research.

Information Technology Resources, Innovativeness, and Supply Chain Capabilities as Drivers of Business Performance: A Retrospective and Future Research Directions

1. Introduction

Four articles considered among the *Industrial Marketing Management* citation classics (Lindgreen & Di Benedetto, 2018) developed frameworks that aimed to capture the factors contributing to the business performance of a firm (see: Calantone, Cavusgil, & Zhao, 2002; Hult, Hurley, & Knight, 2004; Matzler, Bailom, Hinterhuber, Renzl, & Pichler, 2004; Wu, Yeniyurt, Kim, & Cavusgil, 2006). In this paper, we aim to provide an overview of the developments in the field since their publication more than ten years ago and explore avenues for future research. The common theme among the four citation classics that investigate firm performance is their focus on resources and capabilities that drive performance. Calantone et al. (2002) focus on learning orientation and innovation capability. Hult et al. (2004) investigate the drivers and performance implications of innovativeness. Wu et al. (2006) identify the supply chain capabilities that drive performance and investigates information technology resources as a key antecedent. Matzler et al. (2004) focus on the mechanisms through which product attributes impact customer satisfaction and provides new guidance for resource allocation decisions. These four articles made a large impact on the firm performance field and together received more than 6,000 citations (See Table 1).

Insert Table 1 about here

Among resources, information technology (IT) related resources, particularly IT advancement and IT alignment emerge as a key focus in the citation classics and the subsequent

literature. Therefore, in this paper, we review key developments regarding IT resources research since the original publication of Wu et al. (2006). Among organizational capabilities, two major types of capabilities that drive firm performance emerged from the citation classics: innovation capabilities and supply chain capabilities. This paper will provide a selective review of the more influential studies published over the last ten years and build upon the innovation and supply chain capabilities focus of the citation classics.

The objective of this paper is threefold. First, we provide a retrospective on the original articles and a selective literature review regarding business performance research. Second, we identify potential research gaps in this area and provide future research directions on the link between resources, capabilities, and firm performance. Third, we provide our perspective regarding other firm performance measures that should be considered by future research regarding firm resources and capabilities. Finally, we reflect on literature's evolution since the publication of the firm performance related citation classics in *Industrial Marketing Management* and provide suggestions regarding additional factors that could influence firm performance. A visual representation of the factors considered in this paper can be seen in Figure 1.

Insert Figure 1 about here

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2. Information Technology Resources

Wu et al. (2006) focus on IT resources as a driver of supply chain capabilities and firm performance. Over the last decade, the use of information technology in managing the supply chain process and improving firm performance has continued to be a top priority for firms (Wu et al., 2006; Liu, Weiling, Wei, & Hua 2013; Lindgreen & Di Benedetto, 2018). However,

information technology investments can be easily duplicated by other firms and do not provide a source of sustained competitive advantage for the adopting firms (e.g., Powell & Dent-Michallef, 1997). The mechanisms through which IT-related resources are transformed into firm-specific resources and capabilities that create superior value for the firm remains an important research stream (Gligor, Esmark, & Holcomb, 2015). The literature provides some insights regarding this topic. For example, Wu et al. (2006) present a new perspective on IT investments by proposing that IT-enabled supply chain capabilities serve as a key mediator in the relationship between IT-related resources and firm performance. This paper is one of the first empirical studies that link IT resources, supply chain capabilities, and firm performance. The findings indicate that through embedding IT into a firm's supply chain process, a firm can facilitate the development of higher-order organizational capabilities, i.e., supply chain capabilities, which are firm-specific and hard to duplicate across organizations. The information advantage achieved through the adoption of IT in supply chain and the synergistic benefits achieved through IT advancement and IT alignment provide a sustained competitive advantage for a firm (Wu et al., 2006).

IT advancement in the literature is defined as the extent to which a firm adopts the most sophisticated or advanced technology available (Kim, 2003, Kim, Cavusgil, & Calantone, 2006, Wu et al., 2006). Thus, it captures a firm's proactiveness in adopting and implementing most current information technology solutions for its supply chain problems, in advance of its competitors. Kim et al. (2006) touch upon a similar concept by viewing IT advancement from the innovation point of view and presenting the construct of applied technological innovations. This view is rooted in Swanson (1994) and posits that the adoption of new IT solutions can be regarded as an innovation for the firm.

Along with IT advancement, Kim (2003) discusses IT appropriability, which refers to how effectively a firm uses the adopted IT solutions. While IT advancement is related to the type of technology a firm adopts, IT appropriability refers to the actual usefulness of the information technology solution. Interestingly, Kim and Lee (2010) considered both IT advancement and IT appropriability as first-order factors of a higher-order construct of IT competence.

According to Kim (2003), IT advancement does not enhance supply chain capabilities including information exchange and inter-firm coordination directly, but IT appropriability does. IT advancement enhances supply chain capabilities only indirectly through inter-firm systems integration when IT appropriability is present (Kim, 2003; Kim et al., 2006). Regarding the direct impact of IT advancement on supply chain capabilities and firm performance, Kim, Cavusgil, and Calantone (2005) report that IT advancement leads to superior firm performance through supply chain capabilities. However, they found that the impact of IT advancement on supply chain capabilities is consistent across supply chain partners, regardless of their criticality. IT advancement also affects two types of inter-firm collaborations: while it directly affects system collaboration, it indirectly (through improved system collaboration) affects strategic collaboration (Kim & Lee, 2010; Jean, Sinkovics, & Kim, 2014). Other outcomes of IT advancement that the literature reports include firm innovation performance and relational learning (Jean, Sinkovics, & Cavusgil, 2010; Jean, Sinkovics, & Kim, 2010).

While it is relatively clear that IT advancement by itself does not enhance a firm's supply chain capabilities, it is obvious that IT advancement still plays a critical role by enabling the infrastructure of the firm and the supply chain. Therefore, future research should explore the moderators that make IT advancement a direct antecedent of various supply chain capabilities.

IT alignment is defined as the extent to which a firm's IT is compatible with that of its channel partners (Wu et al., 2006, Kim, Cavusgil, & Cavusgil, 2013). While IT advancement and appropriability are critical technology resources at the firm level, the IT resources of only one supply chain partner are not sufficient to develop supply chain level capabilities. For efficient information sharing, the IT resources of a firm need to be compatible and aligned with its supply chain partners. Therefore, IT alignment reveals the degree of embeddedness of information technology across the supply chain and the efforts put in by different supply chain partners to achieve optimal system connectedness (Powell, 1992). While IT alignment is related to inter-firm systems integration (Kim, 2003; Kim, Cavusgil, & Calantone, 2006), the key distinction is IT alignment's emphasis on the technology level interchangeability versus the system-wide connectedness stressed by inter-firm systems integration.

The literature identifies several firm-level outcomes as the outcomes of IT alignment. Kim et al. (2013) suggest, based on their empirical results, that IT alignment facilitates a firm's strategic collaboration with its supply chain partners and enhances its supply chain level responsiveness, which in turn improves the firm's customer value creation. The literature also indicates that IT alignment has a direct and positive effect on operational performance as well as an indirect effect on operational performance through information sharing (Ye & Wang, 2013). Furthermore, IT alignment is a critical prerequisite to IT implementation (Li, Humphreys, Yeung, & Cheng, 2007) and partnership dynamic capabilities (Chang, Chen, & Huang, 2015).

IT alignment is still an under-researched construct especially in terms of its implications for supply chain capabilities and firm performance. Furthermore, the antecedents of IT alignment deserve more empirical research. Although Kim et al. (2013) identified a partner's strategic importance as an antecedent of IT alignment, clarifying how two or more supply chain members

achieve IT alignment to facilitate inter-firm supply chain activities would be an interesting extension that deserves future research attention.

3. Capabilities

The *Industrial Marketing Management* citation classics that investigated the drivers of firm performance focused on two main types of capabilities: innovativeness and supply chain capabilities.

3.1. Innovativeness

Hult et al. (2004) focus on innovativeness and define it as "the capacity to introduce of some new process, product, or idea in the organization" and show that it is a key capability that drives business performance. In their citation classic, they investigate the drivers of innovativeness and find that market, learning, and entrepreneurial orientations are positively associated with innovativeness. Firm innovativeness was found to be an important determinant of business performance regardless of the level of market turbulence in the environment. It also partially mediates the relationship between marketing orientation, learning orientation, entrepreneurial orientation, and business performance (Hult et al., 2004). Calantone et al. (2002) focus on learning orientation as a key driver of a firm's innovativeness. They conceptualize learning orientation as a higher order factor that has four components: commitment to learning, shared vision, open-mindedness, and intraorganizational knowledge sharing. The empirical evidence supported that learning orientation has a positive effect on firm innovativeness, which in turn affects firm performance (Calantone et al., 2002).

Since then, researchers considered other drivers of innovativeness including: emotional and learning capability (Akgun, Keskin, Byrne, & Aren, 2007), trust (Panayides & Lun, 2009), absorptive capacity (Cepeda-Carrion, Cegarra-Navarro, & Jimenez-Jimenez, 2010), IT capability (Kmieciak, Michna, & Meczynska, 2012), and managerial, entrepreneurial and technical capabilities (Kyrgidou & Spyropoulou, 2012). Other notable studies in this domain have investigated the effect of supplier innovativeness on manufacturer performance (Azadegan & Dooley, 2010), the role of customer involvement in innovation (Cui & Wu, 2016; 2017), the role of the top management team characteristics in innovation orientation and performance (Talke, Salomo, & Kock, 2011), the effect of service innovativeness on firm value (Dotzel, Shankar, & Berry, 2013), drivers of co-innovation and its performance outcomes (Yeniyurt, Henke, & Yalcinkaya, 2014), and the effect of network structure on network innovations (Carnovale & Yeniyurt, 2015a). In the business-to-business context, innovativeness and co-innovation remain an important current research domain where despite the significant advancements made, the resources and capabilities needed for developing and implementing innovation in supply chains are not yet fully understood.

3.2. Supply Chain Capabilities

Supply chain capabilities refer to the ability of an organization to identify, utilize, and assimilate both internal and external resources/information to facilitate the entire supply chain activities (Wu et al. 2006). Following the resource-based view, we conceptualize supply chain capabilities as a second-order construct that encompasses four dimensions: information exchange, coordination, inter-firm activity integration, and supply chain responsiveness. These four dimensions not only represent a firm's abilities to perform cross-functional as well as inter-

organizational activities in managing the supply chain process, but also reflect the dynamic nature of such high-order construct that enable a firm to learn and respond proactively to environmental changes (Amit & Schoemaker, 1993; Teece, Pisano, & Shuen, 1997). These types of higher order organizational capabilities are firm-specific and harder to be imitated by competitors, and thus can be a valuable source of sustained competitive advantage for a firm (Barney, 1991).

Past literature has examined the role of IT on supply chain capabilities from different perspectives. For example, past research has studied the performance outcomes of supply chain agility, which emphasizes the rapid reconfiguration of the supply chain process when operating in a highly uncertain environment (e.g., Gligor, Esmark, & Holcomb, 2015; Liu, Weiling, Wei, & Hua, 2013). It highlights the dynamic nature of a firm's supply chain capabilities, which allows a firm to reconfigure the organizational resources and the supply chain process to better respond to shifts in the environment (Teece, Pisano, & Shuen, 1997; Yu, Chavez, Jacobs, & Feng 2018). The findings indicate that supply chain agility can improve customer effectiveness and reduce costs in the supply chain process, which leads to higher financial performance for the firm (Gligor, Esmark, & Holcomb, 2015). Studies have also provided empirical evidence indicating that deploying firm resources to build better IT capabilities such as a flexible IT infrastructure and IT assimilation can enhance supply chain agility, which will ultimately have a positive impact on firm performance (e.g., Liu, Weiling, Wei, & Hua, 2013; Han, Wang, & Naim, 2017).

Relatedly, a large body of literature has studied the role of IT in supply chain integration and its impact on firm performance (e.g., Kim, Jean, & Sinkovics, 2018; Prajogo & Olhager, 2012; Yu, Jacobs, Chavez, & Feng, 2017). In particular, supply chain integration refers to the degree to

which a manufacturer strategically collaborates with its supply chain partners and manage its intra- and inter-organizational processes (Flynn, Huo, & Zhao, 2010). A higher level of IT capability can enhance supply chain integration (Yu et al., 2017), which has been shown to improve firm performance (Kim, 2017; Prajogo & Olhager, 2012). Moreover, past studies have also shown that IT-enabled virtual inter-firm integration can serve as an effective governance mechanism for suppliers and improve cross-border supply chain relationship (Kim et al., 2018).

Information exchange refers to the ability of a firm to share knowledge with its supply chain partners (Wu et al., 2006). An effective IT-enabled supply chain system can facilitate the information exchange between supply chain partners (Prajogo & Olhager, 2012), which has been shown to enhance inter-firm coordination and integration between supply chain partners (Kim et al., 2018; Yu, Jacobs, Chavez, & Feng, 2017). This helps improve the dynamic capabilities of a firm through a higher level of supply chain agility for the firm and its supply chain partners dealing with uncertain environments (Liu et al., 2013). An advanced information system in the supply chain has been shown to provide the basis for the high level of business planning and decision support regarding the supply chain, which has the potential to improve supply chain performance (Yu, Chavez, Jacobs, & Feng, 2018).

While past literature has recognized the importance of information exchange in the supply chain management, a few areas remain to be explored. For example, what are the main drivers for effective information exchange? Can the adoption of an advanced IT system guarantee an improvement in information exchange between supply chain partners? If not, how to effectively govern a data-driven supply chain process? Moreover, with the vast amount of information being collected and exchanged between supply chain partners, future research can examine how to effectively manage the data-driven supply chain process and filter the valuable information out

that would aid in the supply chain decisions and improve firm performance. Also, future research can also examine how a firm can establish an effective information exchange system between supply chain partners to share valuable information in real time and improve supply chain responsiveness. One can also examine the above research questions in a global supply chain setting, and provide guidance on how to effectively managing the global supply chain system and improve supply chain performance.

Another key supply chain capability is the coordination of transaction-related activities with supply chain partners (Wu et al., 2006). Coordination between supply chain partners received significant attention from business to business market researchers and has been conceptualized as an antecedent to business performance. For example, it has been shown that coordination is a key mediating variable between information technology capabilities and business performance (e.g., Huo, Han, & Prajogo, 2015; Jean, Sinkovics, & Kim, 2008; Kim & Lee, 2010). On the other hand, it has been suggested that in the global supply chain context, as the number of partnerships grow, and as a firm becomes more central in the supply network, coordination becomes increasingly difficult and costly, dampening the additional new partnerships that a firm engages in (e.g., Yeniyurt, Townsend, Cavusgil, & Ghauri, 2009; Carnovale & Yeniyurt, 2014). Therefore, future research should consider the resources and capabilities firms need to consider, in addition to information technology, to facilitate coordination and decrease coordination costs among supply chain partners. Additionally, the effects of resources and capabilities on coordination costs are likely to depend on the supply chain and network structure. Therefore, a contingency perspective can be employed to investigate the capabilities required to coordinate transaction-related activities with supply chain partners across different types of network structures.

Activity integration is the third supply chain capability presented by Wu et al. (2006). Activity integration was approached by focusing on the integration across channel partners. Wu et al. (2006) differentiated between inter-firm technology integration and activity integration. While technology integration is related to technology alignment, activity integration is defined as "the extent to which a firm coordinates its strategic channel activities such as planning and forecasting with its supply chain partners." Several studies published since then have built upon this distinction, with some investigating the relationship between technology alignment and activity integration (e.g., Li, Yang, Sun, & Sohal, 2009), while others focused on their consequences. For example, several studies have investigated the effect of activity integration with channel partners on innovation (e.g., Lau, Tang, & Yam, 2010), brand equity (e.g., Seggie, Kim, & Cavusgil, 2006), operational performance (e.g., González-Benito, 2007; Jin, Fawcett, & Fawcett, 2013), and overall firm performance (e.g., Jin et al, 2013; Adams, Richey, Autry, Morgan, & Gabler, 2014). On the other hand, the antecedents of and the efficacy of different approaches to activity integration has also received significant attention (e.g., Li, Yang, Sun, & Sohal, 2009; Jin et al., 2013).

While numerous aspects of activity integration, as well as its antecedents and consequences, have been studied, future research is still needed to investigate under which conditions activity integration results in greater benefits. Further, the relationships between the extent of activity integration across the supply chain and supply chain risk propagation and the firm and supply network's ability to respond to supply chain disruptions require further attention. Also, future studies should consider the role activity integration plays in cross-border and global operations and its interplay with global risks such as foreign market turbulence and anti-globalization pressures. Emerging technologies such as Block Chain, Internet of Things, Cloud Storage, and

Cloud Computing are likely to play an important role in the future of supply chain activity integration and need to be paid close attention. For example, while activity integration with immediate upstream and downstream partners has been studied extensively, integration across the supply chain network, from raw materials to the end consumer has received less attention. This network-level integration is likely to benefit significantly from the emergence of new digitalization technologies.

Finally, supply chain responsiveness has been defined as the dynamic capability of the supply chain partners to respond to environmental changes (Wu et al., 2006). It has been shown that supply chain partnerships are a key driver of supply chain responsiveness, and that supply chain responsiveness enhances performance (Qrunfleh & Tarafdar, 2013). Similarly, Kim and Lee (2010) show that information technology capabilities and inter-firm collaboration affect supply chain responsiveness and drive market performance. In the global supply chain context, Sincovics, Jean, Roath, and Cavusgil (2011) show that information technology integration and trust enhance supply chain responsiveness. It has also been shown that responsiveness enhances customer value creation (Kim et al., 2013). Given that risk and supply chain disruptions are an important avenue for research (e.g., Garvey, Carnovale, & Yeniyurt, 2015), the role that resources such as information technology investments and dynamic capabilities such as responsiveness play in risk management warrants continued attention. While responsiveness focuses on the reactive capabilities of the firm, future research should also account for the resources and capabilities required to implement proactive approaches such as redundancy and slack that firms use to prepare for supply chain disruptions.

4. Performance

How to improve firm performance has always been an important area of research for the past few decades. Researchers have examined firm performance from different perspectives. We review the performance measures considered by the *Industrial Marketing Management* citation classics and the subsequent literature. We focus on customer satisfaction, customer-supplier relationship satisfaction, brand equity, and innovation performance. After that, we provide our perspective regarding emerging performance considerations such as supply chain finance and risk management.

4.1. Business Performance

A large body of research has used business performance at the firm level as the focal performance outcome (e.g., Wu et al., 2006; Calantone et al., 2002; Hult et al., 2004). Past literature has sometimes used business performance interchangeably with firm performance (Calantone et al. 2002), and it can include both market performance and financial performance at the firm level (Hult et al. 2004; Kim & Lee 2010; Wu et al., 2006). Following Venkatraman and Ramanujam (1986), market performance can be measured as a composite index that includes sales growth, market share, product development, and market development while financial performance is defined regarding profitability, ROI, and cash flow from operations (e.g., Wu et al., 2006).

Past literature has studied different ways to improve firm business performance. In the context of supply chain management, Wu et al. (2006) have examined the impact of IT-enabled supply chain on two firm performance measures, i.e., market performance and financial performance. Their findings indicate that IT-enabled supply chain capabilities serve as a mediating role between IT-related resources and firm performance, thus has a positive influence

on the firm market and financial performance. Similarly, Kim and Lee (2010) examined the role of inter-firm collaboration and its impacts on supply chain responsiveness and market performance. Moreover, a higher level of supply chain agility and supply chain integration have also been shown to have positive impacts on firm business performance (Flynn, Huo, & Zhao, 2010; Gligor, Esmark, & Holcomb, 2015; Huo, Han, & Prajogo, 2016; Liu et al., 2013) and improved supply chain performance (Li, Yang, Sun, & Sohal, 2009; Prajogo & Olhager, 2012).

On the other hand, two of the citation classics in *Industrial Marketing Management* have shown that a firm's marketing capability, learning orientation and innovativeness are key drivers of a firm's business performance (Calantone et al., 2002; Hult et al., 2004). Other studies have also supported the above claims. For example, Nath, Nachiappan, and Ramanathan (2010) provided empirical evidence that a firm with a higher level of marketing capability would result in better financial performance for a firm than a firm focusing on operational capabilities alone. Further, Zhang, Wu, and Cui (2015) demonstrated the importance of balancing market exploration and market exploitation in product innovation, and how such balancing act of marketing learning will affect the new product performance at the firm level. Future research can continue along this stream of research on marketing learning and find effective ways to enhance a firm's marketing and learning capability via an advanced IT-enabled digital platforms to improve its business performance.

4.2. Overall Customer Satisfaction

The importance of managing customer satisfaction to improve a firm's financial performance has been long recognized (Anderson, Fornell, & Lehmann 1994). Matzler et al. (2004) examined product attribute-level performance and overall customer satisfaction with a supplier in the auto

industry. The findings indicate an asymmetric relationship between attribute-level performance and overall customer satisfaction, a new consideration that managers need to take into account when resources are allocated in the new product development process. The impact of supply chain relationship on customer satisfaction is under-researched in the literature. Given a firm's supply chain activities and their efficiency heavily influences the service quality in the down-stream value chain activities, the linkage deserves further research attention.

4.3. Customer-Supplier Relationship Satisfaction

Customer-supplier relationship satisfaction is another important indicator of firm performance in the business-to-business context (e.g., Jean, Sinkovics, & Kim, 2008). Managing the customer-supplier relationships is a challenging process that requires the coordination among various parties in the global supply chain process (Jean, Sinkovics, & Cavusgil, 2010; Jean, Sinkovics, & Kim, 2010). Past studies have examined various ways to improve the customer-supplier relationship in the global setting. For example, a boundary spanner's capabilities in strategic communication and job expertise have been found to enhance a customer firm's communications with a supplier, which in turn increases a supplier's willingness to invest (Zhang, Wu, & Henke, 2015). Further, the above process can differ significantly between the different regions in the world that can provide useful guidance for the managerial decisions in the global supply chain process (e.g., Zhang, Wu, & Henke, 2015; Kim, Jean, & Sinkovics, 2018).

Moreover, building a collaborative relationship with their international supply chain partners and improve relationship learning for suppliers in their dealing with international customers can contribute to higher supplier innovativeness and relationship satisfaction (Jean, Sinkovics, &

Cavusgil, 2010; Jean, Sinkovics, & Kim, 2010). Studies have also shown that IT-enabled virtual integration can serve as an alternative governance mechanism for suppliers and helps to improve supplier business performance in the global supply chain setting (Kim et al., 2018). Given the recent development and challenges involved in global supply chain management, future research should continue to explore various ways to utilize information technology to improve customer-supplier relationship in the global setting and provide managerial guidance in managing the various parties in the global arena.

4.4. Brand Equity

Brand equity in the literature is conceptualized in multiple ways. For instance, Aaker (1991) viewed it as a multidimensional construct while for Keller (1993), it is the sum of consumer brand knowledge. Furthermore, Rust, Zeithaml, and Lemon (2000) believe that it is the subjective assessment and high brand equity comes when customers perceive the brand to be prestigious. Viewing it as one of three elements of customer equity, Rust et al. (2000) argue that brand equity reflects a firm's marketing effects uniquely attributable to its brand (p. 80). No matter how it is conceptualized, the consensus among the brand equity scholars is that it is the subjective value of the relationship between the customer and the brand (Rust et al., 2000; Seggie et al., 2006).

According to Seggie et al. (2006), both IT alignment between supply chain partners and inter-firm systems integration help firms enhance its brand equity. Furthermore, they found that brand equity is an important asset for firms as it leads to improved market performance such as sales growth, market share, and market development. Brand equity also affects a firm's financial performance measure such as profitability, ROI, and cash flow (Seggie et al., 2006). For Kim et

al. (2013), brand equity is a part of customer value creation of firms that can be enhanced by IT alignment indirectly through supply chain responsiveness. Their study reveals that there seems to be some mediating mechanism between a firm's IT resources and brand equity to explore further.

Brand equity as an outcome of supply chain capability and IT alignment, a type of firm IT resources, has not received a significant amount of research attention in the literature. However, there are multiple areas of inquiries that deserve future research attention including the specific mechanism that relays the effects of IT alignment to brand equity. For instance, IT alignment or more broadly IT resources may enhance supply chain responsiveness, one of the important immediate outcomes of firm supply chain capabilities (Kim, 2003; Kim et al., 2006), helping understand the link between IT resources and brand equity. IT alignment may also lead to enhanced brand equity through various inter-firm collaborations according to Kim and Lee (2010). Future research may clarify such link through moderators as well. For instance, product type as a potential moderator may determine the impact of a firm's IT alignment/resources on brand equity. Given the exploration stage of the link in the literature, there seem to be multiple opportunities for future research to extend this stream of literature.

4.5. Innovation Performance

Another construct that received significant attention regarding its relationship with resources and capabilities in business-to-business contexts is innovation performance. It is well established that innovation performance can be enhanced by combining the knowledge and expertise of different companies through collaboration (e.g., Bonaccorsi & Lipparini 1994; Ragatz, Handfield, & Scannell, 1997). Complementary resources and capabilities are expected to

generate greater new product development performance (van Echtelt, Wynstra, van Weele, & Duysters, 2008).

Both supplier and customer integration in the product innovation has been found to be crucial in improving innovation performance (Lau et al., 2010). Sharing information with suppliers and co-developing innovations with lead customers/users can directly improve product performance (Lau et al., 2010). Studies have also shown that co-innovation, in the form of supplier involvement in manufacturer's new product development, positively influences a manufacturer's innovation performance over time (e.g., Yeniyurt, et al., 2014). On the other hand, Cui and Wu (2016) provided a comprehensive framework that examines the antecedents and impact of three forms of customer involvement in innovation. Their findings help to provide important theoretical implications as well as practical guidance for managing customer involvement in innovation. Studies have further shown that different forms of customer involvement as an information source or as co-developers can have differential effects on innovation performance depending on the different contingencies (Cui & Wu, 2016; 2017; Fang, 2008)

While most of the literature focuses on firm-level innovation performance, recent research has investigated the effect of inter-firm connections on network level innovation outcomes (Carnovale & Yeniyurt, 2015a). This research reveals that network structure can be regarded as an organizational resource that impacts on not only firm-level performance but also the performance of the overall network. As supply chains grow increasingly more complex and more integrated, future research should continue investigating the drivers of network performance, that is the performance of the overall supply chain, as opposed to focusing on the performance outcomes of only one company. The effects of network level resources and capabilities on

different network level performance outcomes, including network innovation performance remains an important and promising area of future research.

4.6. Supply Chain Finance

An important emerging research topic in the supply chain management literature is supply chain finance. Supply chain finance can be defined as the management of buyer credits, inventories, and cash flows, through coordination with upstream and downstream business partners (e.g., Gupta & Dutta, 2011; Wuttke, Blome, & Henke, 2013). For example, it has been shown that the structure of its inter-firm connections has a significant impact on the financial performance of the focal firm (Carnovale & Yeniyurt, 2015b). Recent work has also shown that firms can draw power from their inter-firm connections and improve their supply chain finance (Carnovale, Rogers, & Yeniyurt, 2018). Therefore, the role that supply chain resources and capabilities play in supply chain finance, both at firm and supply network levels remains an important avenue for future research.

4.7. Risk Management

Risk management is another current research stream where firm level and supply chain level resources and capabilities need to be considered. Risk management can be defined as the process of accounting for certain unexpected events (i.e., disruptions) that have a specific likelihood of occurrence and alleviating their negative consequences (e.g., Craighead, Blackhurst, Rungtusanatham, & Handfield, 2007). It has been shown that the nature of the inter-firm connections, i.e., the supply network structure, affects the propagation of risks in a supply chain (Garvey, Carnovale, & Yeniyurt, 2015). It is generally accepted that firms can manage

their supply chain disruption risks better if they have access to a wider set of suppliers' more diverse resource pool (Blackhurst, Dunn, & Craighead 2011; Zsidisin & Ellram, 2003). Therefore, the role of inter-firm relations and the resources and capabilities associated with managing those relations plays in risk management certainly requires more research.

5. Conclusion

In this paper, we provided a brief overview of the developments in firm performance research since the publication of the four *Industrial Marketing Management* citation classics. Our review has shown that a significant body of literature has investigated different firm capabilities, as well as different antecedents and performance outcomes of these capabilities. Information technology related investments and resources are of particular importance, especially as the trend of digitization is only getting stronger and more prevalent in supply chains (see Uslay & Yeniyurt, 2018).

The citation classics focused on innovativeness and supply chain capabilities as the key drivers of firm performance. Since then, the research regarding both of these capability types has made significant advancements. Nevertheless, innovation and supply chain management continue to be among the top management priorities for firms, and it is likely to persist in the future, as the global competitive pressures compel companies to provide newest products, services, and technologies while continuously increasing the efficiency and effectiveness of their operations. Hence, a particularly important future research avenue remains the relationship between supply chain capabilities and innovation capabilities as managing innovations in a global supply network raises unique challenges for both suppliers and manufacturers (see Carnovale & Yeniyurt 2015a). The impact of the citation classics provides strong evidence

regarding the theoretical power of the resource passed view in investigating the drivers of business performance. What remains to be seen is what novel types of resources and capabilities can be employed to explain business performance in an increasingly connected, digitalized, and data abundant world.

While the effect of resources and capabilities on many different performance metrics have been researched so far, significant gaps that require future research remain. In this paper, we tried to provide a selective review of the performance metrics considered so far and insights regarding the additional performance metrics that can be considered. Nevertheless, the literature is abundant in additional performance metrics that can be considered by marketing researchers in the future (see Katsikeas et al., 2016). As marketing practice is going through major transformations driven by big data and digitalization, it is likely that even more performance metrics that warrant investigation will emerge.

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Table 1. The Impact of *Industrial Marketing Management* Business Performance Citation Classics

Article	**Citations**[1]
Calantone, Cavusgil, & Zhao, 2002	2,862
Hult, Hurley, & Knight, 2004	2,074
Matzler, Bailom, Hinterhuber, Renzl, & Pichler, 2004	788
Wu, Yeniyurt, Kim, & Cavusgil, 2006	698
Total Citations	**6,422**

[1] Google Scholar citations as of January 2019.

Figure 1. Information Technology Resources, Innovativeness, and Supply Chain Capabilities as Drivers of Business Performance