E-Supply Chain Coordination and SME Performance: An Empirical Investigation

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Abstract: This study investigates the impact of key antecedents from technology-organization-environment contexts on developing e-supply chain coordination capability in the small-to-medium enterprise (SME) context. Using data from 271 SMEs in Australia, we find that e-supply chain coordination is driven by IT infrastructure, business partnerships, and customer power. In addition, SMEs with strong e-supply chain coordination capability can achieve outstanding business performance. This study provides an empirical evidence to understand the relationships between these antecedents, e-supply chain coordination capability, and SME performance. These findings suggest that e-business practice is one of key factors that contribute to SME success. SME managers should understand how to utilize internal and external resources to develop e-business competences in order to achieve business goals.

Keywords: E-Supply Chain Coordination, SME Performance, Technology-Organization-Environment Framework, Resource-based View of the Firms

1. Introduction

A growing area in e-business adoption, e-business use and value has gained thematic status in information systems (IS) research in recent years (Lin & Lin 2008; Zhu & Kraemer 2005). A review of the mainstream literature on e-business reveals five distinct gaps. First, due to difficulties associated with developing measures and collecting data, most research hinges heavily on case studies, with limited quantitative data to gauge the scale and characteristics of e-business and its impact on firm performance (Kauffman & Walden 2001; Zhu et al. 2004). Second, when investigating the impact of information technology (IT), most studies have focused on larger companies. Small-to-medium enterprises (SMEs) have attracted comparatively less attention, though they comprise a major part of industrial economies (Johnson et al. 2007). Research related to e-business practices in the SME context is still limited and the benefits SMEs derive from e-business are far from comprehensive (Raymond & Bergeron 2008). Third, there appears to be a lack of theory to guide empirical work in previous IS research (Wheeler 2002), heightening the need for greater attention to conceptual development (Zhu et al. 2004). Researchers, such as Chan (2000), have called for more research employing unifying theory-based framework to assess the impacts of e-business. Fourth, limited studies have been conducted to evaluate the relationships between e-supply chain coordination and SME performance. IS research has been characterized as fragmentary with limited work examining the synergistic effects of complementarities between IT complementary resources and organizational capabilities on firm performance (Ravinchandran & Lertwongsatien 2005). Lastly, although it is acknowledged that firms build strategic relationships with business partners to facilitate information sharing and to enhance collaboration, studies on how the business value of IT is co-created within inter-organizational networks remains scanty (Kohli & Grover 2008).

This study attempts to fill these gaps. Using the technology-organization-environment (TOE) framework advanced by Tornatzky and Fleischer (1990), coupled with the resource-based view (RBV) of the firms (Barney 1991), we developed a research model to explore the antecedents of e-supply chain coordination capability and its effects on SME performance. Figure 1 depicts our proposed research model, which identifies IT Infrastructure (technological context), business partnerships (organizational context), and customer power (environmental context) as three antecedents driving e-supply chain coordination to create business value which are measured by SME performance. In this study, e-supply chain coordination refers to a firm's ability to use e-business technologies in order to deal with transactional activities among its supply chain partners. The activities involved range from gathering product information to post-order follow-up (Kim et al. 2006). The effectiveness of e-supply chain coordination, therefore, lies in a firm's ability to carry out comparable transaction activities, including procurement, online order taking, and post-order follow-up, using less resources (i.e., time and cost) than its competitors. We posit that e-supply chain coordination is an organizational capability, which emerges from the effects of IT infrastructure (i.e., quality and quantity of a firm's IT resources), business partnerships (i.e., the collaborative relationships a firm has established with its

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business partners), and customer power (i.e., the influence of a firm's customer perceptions on its e-business practices). We tested the model using data from a survey of 271 SMEs from across a broad range of industries in Australia. The research question we seek to explore is: How do SMEs create business value by leveraging their e-supply chain coordination capability? We analyzed our data using structural equation modeling (AMOS 19.0). The rationale undergirding the causal links between these antecedents, e-supply chain coordination capability, and SME performance is elaborated below.

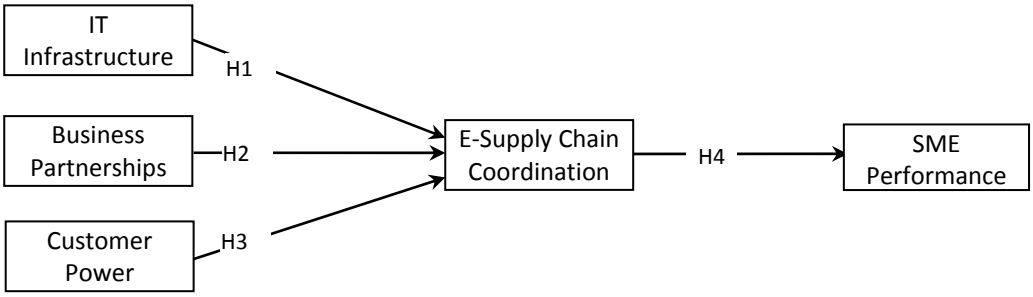

Figure 1: Proposed Research Model

2. Theorectical Background And Hypotheses

Zhu et al. (2003) contend that Tornatzky and Fleischer's (1990) TOE framework offers a comprehensive contextual backdrop to explore factors driving firms to adopt, implement, and engage in e-business. Technology context describes "both internal and external technologies relevant to firms, including existing technologies and the pool of available technologies in the market". Organizational context pertains to the characteristics of the focal firm and includes "firm size and scope; centralization, formalization and complexity of managerial structures; quality of human resources; and extent of available internal slack resources". Environmental context refers to "the arena within which firms conduct business: industry sector, competitors, and access to resources" (Tornatzky & Fleischer 1990, pp. 152-154). From the perspective of TOE, e-business use is enabled by technological development, driven by organizational characteristics, and influenced by environmental factors (Zhu & Kraemer 2002). In many aspects, the conceptual underpinnings of Tornatzky and Fleischer's (1990) TOE are consistent with those of Roger's (1983) theory of technology diffusion. It is, therefore, not surprising to find that many of the early applications of TOE to research in various IS domains, such as electronic data interchange (EDI) (Iacovou et al. 1995), open systems (Chau & Tam 1997), and material requirement planning (Thong 1999) predominantly utilized TOE to examine technology adoption (Zhu et al. 2003). The application of TOE has recently been extended to the e-business arena, examining determinants of successful e-business use and diffusion (Bi et al. 2014; Lin & Lin 2008; Zhu & Kraemer 2005). Given the empirical support for the TOE framework and its sound theoretical grounding, we likewise have chosen the TOE framework to examine the antecedents of e-supply chain coordination capability in developing our model.

RBV provides anther theoretical basis for linking e-supply chain coordination capability and SME performance. Rooted in strategic management theory, RBV posits that firms have capacity to possess resources enabling achievement of competitive advantage, and superior long-term performance (Barney 1991). The RBV framework asserts that resources need to exhibit particular attributes - valuable, rare, inimitable and non-substitutable (VRIN) - by rivals in order to achieve and sustain a competitive advantage (Barney 1991; Peteraf 1993). RBV provides a solid framework to understand how and why firms succeed and achieve sustainable competitive advantage through treatment of resources and capabilities as primary sources of profitability (Amit & Schoemaker 1993; Makadok 2001). According to RBV, IT resources cannot create and sustain competitive advantage by themselves because of their commoditized characteristics. Although IT does not provide distinctive advantages, leveraging IT with other organizational resources and skills as complementarities helps firms to produce sustainable performance advantages (Bharadwaj 2000; Mata et al. 1995). In this study, we propose that e-supply chain coordination capability is built and enhanced by complementary resources within and across organizations. E-supply chain coordination capability is an outcome of the managerial decisions about how to utilize complementary resources to create value. Because of its unique and non-imitable features, e-supply chain coordination capability is not easily copied by competitors, helping SMEs to gain competitive advantage. In sum, we use TOE framework and RBV theory to form a synergistic, complementary set of theoretical underpinnings to explore relationships between

technological, organizational and environmental factors, e-supply chain coordination capability, and SME performance.

2.1 IT Infrastructure and E-Supply Chain Coordination Capability

E-supply chain coordination is enabled by technology competence, such as IT infrastructure (Bharadwaj 2000; Zhu 2004). Referred to physical IT assets (e.g., computers, communication facilities, shareable technical platforms and databases) (Ross et al. 1996), IT infrastructure provides firms with a solid platform upon which companies can use e-business technologies to conduct supply chain activities (Zhu & Kraemer 2005). A flexible IT infrastructure also enables firms to build an agile technology platform for their future development (Bharadwaj 2000). IT infrastructure helps SMEs to build strong links with their trading partners, foster coordination, integration, and responsiveness to market changes (Bi et al. 2014). SMEs with sound and flexible IT infrastructure are more capable of developing robust e-supply chain coordination capability and conduct business activities efficiently (Bi et al. 2015; Wu et al. 2006). Accordingly, we hypothesize that:

H1. IT infrastructure has a positive impact on e-supply chain coordination capability.

2.2 Business Partnerships and E-Supply Chain Coordination Capability

Organizational factors can constrain, facilitate, or enhance e-business capability (Teo et al. 2003). Business partnerships refer to open and trusting relationships between companies and their business associates for the pursuit of mutually compatible benefits (Powell & Dent-Micallef 1997). High levels of mutual trust among supply chain members encourage the development of stable and long-lived relationships (Arora et al. 2016; Shi & Liao 2015), which empower firms to better coordinate their strategic business activities (Esper & Lisa 2003). In the e-supply chain context, having strategic relationships with business partners can facilitate collaboration in resource planning and replenishment, order forecasting, and work scheduling (Dong et al. 2009). Literature (Bi et al. 2014) suggests that close business relationships enable SMEs to strategically coordinate their internal processes with organizations across their supply chains, eventually leading to improved business performance. Accordingly, we hypothesize that:

H2. Business partnerships have a positive impact on e-supply chain coordination capability.

2.3 Customer Power and E-Supply Chain Coordination Capability

E-supply chain coordination capability is also influenced by environmental factors, such as situations of customers. Customer power refers to exogenous customer demands on businesses to implement specific practices (Soto-Acosta et al. 2014; Wu et al. 2003). Powerful customers can influence firms to adopt and implement e-business technologies to shape their e-business capability, since customer relationships are significant determinants of inter-organizational systems adoption and implementation (Chau & Tam 1997; Nguyen & Waring 2013; Wu et al. 2003). Martins et al. (2014) suggest that powerful customers/suppliers could force supply chain partners to use e-business because value can be maximized only when many trading partners are engaged in e-business. Christensen and Joseph (1996, p. 199) indicate that “when significant customers demand it, sufficient impetus may develop so that large, bureaucratic firms can embark upon and successfully execute technologically difficult innovations - even those that require very different competencies than they initially possessed”. Similarly, Nguyen et al. (2015) also argue that firms’ decisions on innovation adoption largely depends on the will of powerful external constituencies (e.g., customer power). With the growing popularity of Internet technology, customers understand how to use Internet to conduct online customer service, order taking, order status tracking, and online information updating (Bi et al. 2014). Customers can thus exert a strong influence on the ways firms choose to do business with them. Increased customer power will likely to coerce firms to embrace new e-business technologies that streamline communications and enhance supply chain coordination activities in order to meet specific customer needs (Martins et al. 2014; Yan Xin et al. 2014). Accordingly, we hypothesize that:

H3. Customer power has a positive impact on e-supply chain coordination capability.

2.4 E-Supply Chain Coordination Capability and SME Performance

Drawing upon RBV theory, we posit that e-supply chain coordination capability, built and enhanced by complementary organizational resources and embedded within business processes along the supply chain, can lead to superior performance outcomes. Wu et al. (2006), for instance, note that e-supply chain coordination

capability can enhance efficiency in order taking, lessening transaction and other intermediary-related costs. Because customers can readily access offered products and services in an e-business environment, which is intermediary-free, e-supply chain coordination capability can improve sales performance (Shi & Liao 2015). SMEs can secure sales by reaching out to customers directly and promptly through e-business when launching new products and by tapping into markets that might be inaccessible due to distribution or infrastructural restrictions (Tanco et al. 2015). E-supply chain coordination capability allows SMEs to share information with supply chain partners and customers in a timely manner, thus strengthening strategic collaboration and enhancing sales performance (Cheng 2011; Devaraj et al. 2007).

As firms extend their business boundaries and integrate customers into their value creation processes, effective e-supply chain coordination capability can improve firm performance through increasing customer satisfaction (Bi et al. 2011). For example, in an e-business environment, customers can shop without the usual limitations of time and place associated with non-virtual market settings, and can also electronically track and trace their orders, allowing them to monitor their orders closely to prevent mistakes and minimize delays (Wu et al. 2003). Studies (Bi et al. 2014; Frohlich & Westbrook 2001) suggest that firms with the ability to integrate suppliers and customers into their business activities through the use of e-business technologies can achieve performance improvements in sales, new product development, market share, and customer satisfaction. Accordingly, we hypothesize that:

H4. E-Supply chain coordination capability has a positive impact on SME performance.

3. Research Methodology

3.1 Sample and Procedures

The samples in this study were 1,335 Australian fast-growth SMEs complied by Business Review Weekly (BRW). We selected fast-growth SMEs because these enterprises “are willing to take risks, to be innovative, and to initiate aggressive competitive actions” (Upton et al. 2001, p. 61). A personalized online survey was sent to either the founder or CEO of all 1,335 fast-growth SMEs. Of the sample, 271 completed questionnaires were obtained, which gave a response rate of 20.2%. Our sample contains companies across Information Technology (18.8%), Property and Business Services (18.1%), Personal and Other Services (9.6%), Finance and Insurance (8.9%), Communications (6.6%), and other industry sectors such as Construction, Retail Trade, Health and Community Services etc. (38%). All responding firms had achieved a growth rate in excess of 21%.

We compared the differences in responses to all the constructs between early respondents and late respondents (Bi et al. 2011). Independent sample *t*-tests on each construct failed to reveal significant differences between early and late respondents (all *p*-values>.05), suggesting that non-response bias was not an issue. We also tested common method bias using structural equation modeling (SEM) procedures to examine the influence of social desirability on the research constructs (Bi et al. 2011; Podsakoff et al. 2003). We found no significant relationships between the social desirability construct and the research constructs (all *p*-values >.05), suggesting that social desirability does not contribute significantly to the model and there is no common method bias.

3.2 Constructs

Measurement items were developed based on the literature. All constructs were assessed with seven-point Likert scale ranging from Strongly Disagree (1) and Strongly Agree (7). IT infrastructure was measured via a two-item scale adapted from Lin and Lin (2008). Business partnerships were measured via the three-item scale adapted from Kim et al. (2006). Customer power was measured via a three-item scale adapted from Wu et al. (2003). E-supply chain coordination capability was measured via a three-item scale adapted from Wu et al. (2003) and Kim et al. (2006). SME performance was measured via a four-item scale adapted from McDermott and Prajogo (2012), including sales volume, market development, new product development, and customer satisfaction.

3.3 Data Analysis

Data were analyzed with AMOS 19.0 involving a maximum likelihood (ML) estimation method. Tables 1 and 2 show correlations and descriptive statistics and measurement properties of constructs. Instrument validation proceeded through four steps: calculation of construct reliability; variance extracted estimates; and evaluation of convergent and discriminant validity (Bi et al. 2011). In this study, indicator reliability values range between

0.50 and 0.88, and composite reliability values exceed the recommended value of 0.7. All estimates exceed the recommended value of 0.5. Our results suggest that there is no discriminant validity issue. Confirmatory and full structural model fit were assessed using multiple indices (Bi et al. 2011), including χ^2/df, CFI, TLI, SRMR, and RMSEA. All five measurement models tested were found to meet the criteria set for these indices (i.e., χ^2/df ratio < 3; CFI and TLI > .90; SRMR < .08; and RMSEA < .08).

Table 1: Correlation Matrix, Mean Scores and Standardized Deviations

	Mean	SD	1	2	3	4	5
1. IT Infrastructure	5.53	1.10	**.83**				
2. Business Partnerships	4.21	1.63	.22**	**.93**			
3. Customer Power	4.70	1.44	.28**	.20**	**.85**		
4. E-Supply Chain Coordination	4.36	1.25	.36**	.44**	.32**	**.88**	
5. SME Performance	5.50	1.34	.23**	.22**	.29**	.49**	**.90**

Note. *p<.05. **p<.01; diagonal elements are the square roots of the average variance extracted from their indicators.

Table 2: Confirmatory Factor Analysis: Standardized Loadings and Reliability

Constructs	**Cronbach's α**	**Construct Reliability**	**Variance Extraction**	**Range of Standardized Loadings**	**Range of Indicator Reliability**
1. IT Infrastructure	.81	.82	.70	.74 - .93	.55 - .86
2. Business Partnerships	.95	.95	.86	.90 - .94	.82 - .88
3. Customer Power	.89	.89	.73	.84 - .87	.71 - .76
4. E-Supply Chain Coordination	.91	.91	.77	.84 - .93	.70 - .87
5. SME Performance	.89	.89	.81	.88 - .91	.78 - .83

Note. All factor loadings are significant at p<.001 level

4. Results

Table 3 summarizes the test results, showing a good model fit between our theoretical model and sample covariances: $\chi^2(83)=168.405$, $\chi^2/df=2.029$, CFI=.969, TLI=.961, SRMR=.055, and RMSEA=.062. The results also indicate that the overall research model was supported. IT infrastructure is positively related to e-supply chain coordination capability, supporting H1 (β=.29, p<.001). Business partnerships have a positive effect on e-supply chain coordination capability, supporting H2 (β=.33, p<.001). Customer power significantly enhances e-supply chain coordination capability, supporting H3 (β =.18, p<.01). E-supply chain coordination capability has a significantly positive impact on SME performance, supporting H4 (β=.56, p<.001). Figure 2 shows that this research model accounts for 34% of the variance in e-supply chain coordination, 32% of the variance in SME performance.

Table 3: Proposed Hypotheses and Test Results

Hypothesis	**Standardized Path Estimates**	**Conclusion**
H1: IT Infrastructure → E-Supply Chain Coordination Capability	.29***	Supported
H2: Business Partnerships → E-Supply Chain Coordination Capability	.33***	Supported
H3: Customer Power → E-Supply Chain Coordination Capability	.18**	Supported
H4: E-Supply Chain Coordination Capability → SME Performance	.56***	Supported
Model Fit Indices $\chi^2(83)=168.405$ $\chi^2/df=2.029$ CFI=.969, TLI=.961 SRMR=.055 RMSEA=.062		

Note. *p<.05. **p<.01. ***p<.001.

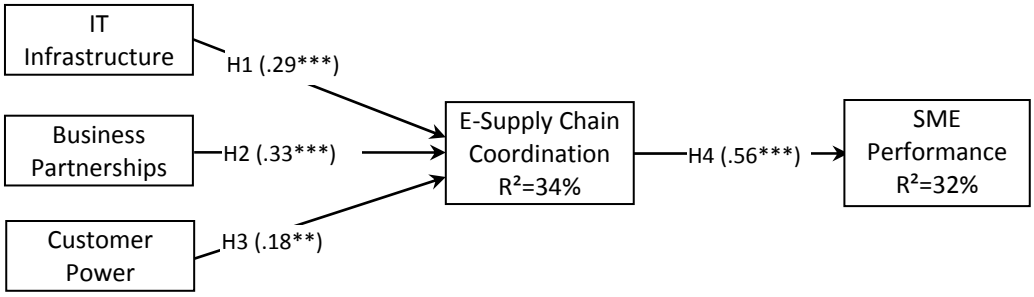

Figure 2: Results of Full Structural Model

5. Discussion

Three proposed factors within the TOE framework- IT infrastructure, business partnerships, and customer power were found to have statistically significant effects on e-supply chain coordination capability. Among them, business partnerships are the strongest predictors, followed by IT infrastructure and then customer power. In turn, e-supply chain coordination capability was found to be a source of business value, contributing significantly to SME performance. The significant link between e-supply chain coordination capability and SME performance suggests that e-business use can be regarded as a "missing link" to IT payoff (Devaraj & Kohli 2003). While e-supply chain coordination directly contributes to business value, IT infrastructure, business partnerships, and customer power also play a role in creating business value indirectly. Given that the proposed model is empirically tested using a sample of SMEs, these findings suggest that a solid IT infrastructure base coupled with a constant attempt to maintain close collaborative business relationships with both suppliers and customers are needed for SMEs to nourish the dynamics of e-supply chain coordination capability. In the environmental context, distinctive sensitivity toward customer needs is essential owning to the power customers have in an online business environment. Our results indicate that e-business has become an integral part of SMEs' routine business processes.

Our results are consistent with findings of several earlier studies on e-supply chain coordination capability and business performance. For instance, in a study on the impact of e-business technologies on organizational collaboration and performance, Sanders (2007) demonstrate the necessity for firms to have a solid IT infrastructure base to efficiently conduct e-business activities along the supply chain. Our results show that fast-growth SMEs are no different. They also rely considerably on state-of-the-art IT infrastructure to sharpen their e-coordination capability. In addition, our findings also support Gulati et al.'s (2000) observation: maintaining close collaborative business relationships with both suppliers and customers is an important ingredient in creating business value. Lastly, our results also indicate that customer power (a powerful constituent in business environment) could influence firms to develop specific e-business capability, which coincides with Wu et al.'s (2003) finding: customer power has the effect of forcing businesses to invest in e-business technology innovation.

This study has four implications for research. First, this research presents a theoretically integrated model to explicate the relationships between factors embedded within the TOE framework and e-supply chain coordination capability and SME performance. TOE framework and RBV theory were sourced to provide a comprehensive theoretical lens to view the complex phenomena of e-supply chain coordination capability development. This investigation confirms the tenets of RBV theory in the e-business environment, suggesting that e-supply chain coordination capability emerge from complementary resources and are embedded within business processes. This capability is valuable, rare, inimitable and non-substitutable, helping firms to create business advantage. Second, this study incorporates IT resources, organizational resources (i.e., business partnerships), external environmental factors (i.e., customer power), and business processes (i.e., coordination) to conceptualize e-supply chain coordination capability. Understanding how organizations develop IT-enabled organizational capability is imperative to effectively evaluate IT business value (Sambamurthy et al. 2003). Using resource-picking and capability-building mechanisms, this study explains how e-supply chain coordination capability, enabled by complementary resources and IT-enabled process-embeddedness, is valuable for firms to create and sustain advantages. Third, this study informs an enduring debate about IT business value in the IS field. This investigation shows that IT business value originates from the complementary developmental effects of IT resources with other organizational resources (i.e., strategic

business relationships with partners), as well as those of IT-enabled processes with business routines. Additionally, this study extends IT business value research in two ways. On the one hand, by examining e-supply chain capability from a coordination perspective, this research explores how IT-enabled resources co-create values in a multi-firm environment. At the same time, this investigation examines IT business value at fast-growth SME level. Most extant research tend to focus on larger firms, which could lead to a preconceived notion about IT value being endemic only among large organizations (Eikebrokk & Olsen 2007). This research demonstrates that despite the lack of resources compared with their larger counterparts, SMEs can also gain business value by developing their e-supply chain coordination capability from their resource bundles (technology and partnerships) to create core competencies and gain rapid growth. Finally, this study contributes to the IS, operations and supply chain management research by examining the business benefits of e-supply chain capability. This investigation confirms the observation of Rayport and Jaworsky (2004, p. 58): "as the focus of competition shifts from what companies do to how they do it, the new frontier of competitive advantage lies in the quality of interactions and relationships companies can establish with their customers and market".

This study has several important implications for SME management practices. First, this study helps SME managers to understand the way in which how IT investments can contribute to business value. Managers can use our research model as a useful starting point when they plan to identify IT resources and core processes to foster the development of a specific organizational capability. Second, our model shows that e-supply chain coordination capability impacts significantly on business performance. SME managers should understand the imperative role of developing strong relationships with business partners in achieving long-term business benefits. Third, this study also identifies that customer power can be regarded as a valuable source for firms to create value. Customer power requires managers to pay close attention to the inclinations of powerful constituencies in external environments when making decision to adopt and use new IT technologies. Customer power is normative pressure that could shape the direction of e-business capability development. Our model shows that IT infrastructure and business partnerships have greater effects than customer power in creating business value. SME managers should concentrate more on exploring IT resources and developing e-business processes than reacting to competitor and customer pressures, though the contributory roles of the latter cannot be overlooked.

This study has some limitations. The first limitation is a cross-sectional research design, which does not provide insight into the dynamics of e-supply chain coordination capability. E-supply chain coordination may evolve over time as firms need reconfigure their resources to adapt to technological and business environment changes. Future research might address this issue using longitudinal designs. The second limitation is the utilization of single-informant (CEO and/or founder) in the present study. Future research might consider obtaining data from managers across different functions to reduce the reporting bias. Finally, this study was conducted using a relatively small proportion of self-selected fast-growth SMEs in a specific geographic region. Future research should replicate the estimated relationships using either larger firms or other types of SMEs across different geographic regions to test the generalizability of the findings.

6. Conclusion

By combining the premise of the TOE framework with the tenets of RBV theory, we developed and empirically tested a conceptual model to examine the contributory roles of technological, organizational and environmental factors on e-supply chain coordination capability using data collected from SMEs in Australia. Evidence from our sample indicates that SMEs are e-business-active enterprises. Relating our findings to the questions we seek to explore on fast-growth SMEs, we conclude that while the success of fast-growth SMEs could be attributable to many factors, their e-business practice is certainly one of those that contributed to their exceptional growth. Moreover, our results suggest that SMEs able to develop superior e-supply chain coordination capability would be well placed to secure customer satisfaction and gain sales. Packham et al. (2005) contend that SME growth is not only attributable to the exploitation of niche opportunities in growing markets, but a willingness of entrepreneurs to pursue growth and manage that process through sound management practices. We are of the view that e-supply chain coordination capability provides the differentiating ingredient that propels SMEs to take risk, exploit niche opportunities, innovate, and initiate aggressive competitive actions to gain competitive advantage. Likewise, e-supply chain coordination also enables the complex risk-taking, innovative, and exploitative processes to be orderly managed. Our findings offer a preliminary knowledge base to researchers and practitioners interested in understanding how SMEs

utilize their internal and external resources to build distinctive e-supply chain competencies. We hope our study will stimulate further work in this relatively neglected, but economically important, sector.

References

Amit, R & Schoemaker, PJH 1993, 'Strategic assets and organizational rent', *Strategic Management Journal*, vol. 14, no. 1, pp. 33-46.

Arora, A, Arora, A & Sivakumar, K 2016, 'Relationships among supply chain strategies, organizational performance, and technological and market turbulences', *The International Journal of Logistics Management*, vol. 27, no. 1, pp. 206-232.

Barney, JB 1991, 'Firm Resources and Sustained Competitive Advantage', *Journal of Managment*, vol. 17, no. 1, pp. 99-120.

Bharadwaj, AS 2000, 'A Resource-based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation', *MIS Quarterly*, vol. 24, no. 1, pp. 169-196.

Bi, R, Davison, RM & Smyrnios, KX 2014, 'E-Business Use and Value for Fast Growth Small-to-medium Enterprises in Turbulent Environment', paper presented to 18th Pacific Asia Conference on Information Systems Chengdu China.

Bi, R, Davison, RM & Smyrnios, KX 2015, 'IT and Fast Growth Small-to-Medium Enterprise Performance: An Empirical Study in Australia', Australasian Journal of Information Systems, vol. 19, pp. S247-S266.

Bi, R, Kam, B & Smyrnios, KX 2011, 'IT Resources, Supply Chain Coordination Competency and Firm Performance: an Empirical Study', paper presented to 15th Pacific Asia Conference on Information Systems Brisbane, Australia.

Chan, Y 2000, 'IT value: the greate divide between Qualitative and Quantitative and individual and organization measures', *Journal of Management Information Systems*, vol. 16, no. 4, pp. 225-261.

Chau, PYK & Tam, KY 1997, 'Factors Affecting the Adoption of Open Systems: An Exploratory Study', *MIS Quarterly*, vol. 21, no. 1, pp. 1-24.

Cheng, J-H 2011, 'Inter-organizational relationships and information sharing in supply chains', *International Journal of Information Management*, vol. 31, no. 4, pp. 374-384.

Christensen, CM & Joseph, LB 1996, 'Customer power, strategic investment, and the failure of leading firms ', *Strategic Management Journal*, vol. 17, no. 3, pp. 197-218.

Devaraj, S & Kohli, R 2003, 'Performance Impacts of Information Technology: Is Actual Usage the Missing Link?', *Management Science*, vol. 49, no. 3, pp. 273-289.

Devaraj, S, Krajewski, L & Wei, JC 2007, 'Impact of eBusiness technologies on operational performance: The role of production information integration in the supply chain', *Journal of Operations Management*, vol. 25, no. 6, pp. 1199-1216.

Dong, S, Xu, SX & Zhu, K 2009, 'Information Technology in Supply Chain: The Value of IT-Enabled Resources Under Competition', *Information Systems Research*, vol. 20, no. 1, pp. 18-32.

Eikebrokk, TR & Olsen, DH 2007, 'An empirical investigation of competency factors affecting e-business success in European SMEs', *Information & Management*, vol. 44, no. 4, pp. 364-383.

Esper, TL & Lisa, RW 2003, 'The value of collaborative transportation management(CTM): Its relationship to CPFR and information technology', *Transportation Journal*, vol. 42, no. 4, pp. 55-65.

Frohlich, MT & Westbrook, R 2001, 'Arcs of integration: an international study of supply chain strategies', *Journal of Operations Management*, vol. 19, no. 2, pp. 185-200.

Gulati, R, Nohria, N & Zaheer, A 2000, 'Strategic networks', *Strategic Management Journal*, vol. 21, no. 3, pp. 203-215.

Iacovou, CL, Benbasat, I & Dexter, AS 1995, 'Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology', *MIS Quarterly*, vol. 19, no. 4, pp. 465-485.

Johnson, PF, Klassen, RD, Leenders, MR & Awaysheh, A 2007, 'Utilizing e-business technologies in supply chains: The impact of firm characteristics and teams', *Journal of Operations Management*, vol. 25, no. 6, pp. 1255-1274.

Kauffman, R & Walden, E 2001, 'Economics and electronic commerce: Survey and directions for research', *International Journal of Electronic Commerce*, vol. 5, no. 4, pp. 5-116.

Kim, D, Cavusgil, ST & Calantone, RJ 2006, 'Information System Innovations and Supply Chain Management: Channel Relationships and Firm Performance', *Journal of the Academy of Marketing Science*, vol. 34, no. 1, pp. 40-54.

Kohli, R & Grover, V 2008, 'Business Value of IT: An Essay on Expanding Research Directions to Keep up with the Times', *Journal of the Association for Information Systems*, vol. 9, no. 1, pp. 23-39.

Lin, HF & Lin, SM 2008, 'Determinants of e-business diffusion: A test of the technology diffusion perspective', *Technovation*, vol. 28, pp. 135-145.

Makadok, R 2001, 'Toward a synthesis of the Resource-Based and Dynamic-Capability views of rent creation', *Strategic Management Journal*, vol. 22, no. 5, pp. 387-401.

Martins, C, Oliveira, T & Popovič, A 2014, 'Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application', *International Journal of Information Management*, vol. 34, no. 1, pp. 1-13.

Mata, FJ, Fuerst, WL & Barney, JB 1995, 'Information Technology and Sustained Competitive Advantage: A Resource-Based Analysis', *MIS Quarterly*, vol. 19, no. 4, pp. 487-505.

McDermott, CM & Prajogo, DI 2012, 'Service innovation and performance in SMEs', *International Journal of Operations & Production Management*, vol. 32, no. 2, pp. 216-237.

Nguyen, TH, Newby, M & Macaulay, MJ 2015, 'Information Technology Adoption in Small Business: Confirmation of a Proposed Framework', *Journal of Small Business Management*, vol. 53, no. 1, pp. 207-227.
Nguyen, TH & Waring, TS 2013, 'The adoption of customer relationship management (CRM) technology in SMEs: An empirical study', *Journal of Small Business and Enterprise Development*, vol. 20, no. 4, pp. 824-848.
Packham, G, Brooksbank, D, Miller, C & Thomas, B 2005, 'Climbing the mountain: Management practice adoption in growth oriented firms in Wales', *Journal of Small Business and Enterprise Development*, vol. 12, no. 4, pp. 482-497.
Peteraf, MA 1993, 'The cornerstones of competitive advantage: A resource-based view', *Strategic Management Journal*, vol. 14, no. 3, pp. 179-191.
Podsakoff, PM, MacKenzie, SB, Lee, J-Y & Podsakoff, NP 2003, 'Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies', *Journal of Applied Psychology*, vol. 88, no. 5, pp. 879-903.
Powell, TC & Dent-Micallef, A 1997, 'Information technology as competitive advantage: the role of human, business and technology resources.', *Strategic Management Journal*, vol. 18, no. 5, pp. 375-405.
Ravinchandran, T & Lertwongsatien, C 2005, 'Effect of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective', *Journal of Management Information Systems*, vol. 21, no. 4, pp. 237-276.
Raymond, L & Bergeron, F 2008, 'Enabling the business strategy of SMEs through e-business capabilities: A strategic alignment perspective', *Industrial Management & Data*, vol. 108, no. 5, pp. 577-595.
Rayport, JF & Jaworsky, BJ 2004, 'Best face forward', *Harvard Business Review*, vol. 82, no. 12, pp. 47-58.
Rogers, EM 1983, *Diffusion of Innovations*, Free Press, New York.
Ross, JW, Beath, CM & Goodlue, DL 1996, 'Developing long-term competitiveness through IT assets', *Sloan Management Review*, vol. 38, no. 1, pp. 31-45.
Sambamurthy, V, Bharadwaj, A & Grover, V 2003, 'Shaping agility through digital options: reconceptualizing the role of information technology in contemporary firms', *MIS Quarterly*, vol. 27, no. 2, pp. 237-263.
Sanders, NR 2007, 'An empirical study of the impact of e-business technologies on organizational collaboration and performance', *Journal of Operations Management*, vol. 25, no. 6, pp. 1332-1347.
Shi, X & Liao, Z 2015, 'Inter-firm dependence, inter-firm trust, and operational performance: The mediating effect of e-business integration', *Information & Management*, vol. 52, no. 8, pp. 943-950.
Soto-Acosta, P, Colomo-Palacios, R & Popa, S 2014, 'Web knowledge sharing and its effect on innovation: an empirical investigation in SMEs', *Knowledge Management Research & Practice*, vol. 12, no. 1, pp. 103-113.
Tanco, M, Jurburg, D & Escuder, M 2015, 'Main difficulties hindering supply chain performance: an exploratory analysis at Uruguayan SMEs', *Supply Chain Management: An International Journal*, vol. 20, no. 1, pp. 11-23.
Teo, HH, Wei, KK & Benbasat, I 2003, 'Predicting intention to adopt interorganizational linkages: an institutional perspective ', *MIS Quarterly*, vol. 27, no. 1, pp. 19-49.
Thong, JYL 1999, 'An Integrated Model of Information Systems Adoption in Small Businesses', *Journal of Management Information Systems*, vol. 15, no. 4, pp. 187-214.
Tornatzky, LG & Fleischer, M 1990, *The Process of Technological Innovation*, Lexington Books, Lexington, MA.
Upton, N, Teal, EJ & Felan, JT 2001, 'Strategic and Business Planning Practices of Fast Growth Family Firms', *Journal of Small Business Management*, vol. 39, no. 1, pp. 60-72.
Wheeler, BC 2002, 'A dynamic capabilities theory for assessing Net-enablement', *Information Systems Research*, vol. 13, no. 2, pp. 125-146.
Wu, F, Mahajan, V & Balasubramanian, S 2003, 'An Analysis of E-Business Adoption and Its Impact on Business Performance', *Journal of the Academy of Marketing Science*, vol. 31, no. 4, pp. 425-447.
Wu, F, Yeniyurt, S, Kim, D & Cavusgil, ST 2006, 'The impact of information technology on supply chain capabilities and firm performance: A resource-based view', *Industrial Marketing Management*, vol. 35, no. 4, pp. 493-504.
Yan Xin, J, Ramayah, T, Soto-Acosta, P, Popa, S & Ai Ping, T 2014, 'Analyzing the Use of Web 2.0 for Brand Awareness and Competitive Advantage: An Empirical Study in the Malaysian Hospitability Industry', *Information Systems Management*, vol. 31, no. 2, pp. 96-103.
Zhu, K 2004, 'The Complementarity of Information Technology Infrastructure and E-Commerce Capability: A Resource-Based Assessment of Their Business Value', *Journal of Management Information Systems*, vol. 21, no. 1, pp. 167-202.
Zhu, K, Kraemer, K & Xu, S 2003, 'Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors', *European Journal of Information Systems*, vol. 12, no. 4, pp. 251-268.
Zhu, K & Kraemer, KL 2002, 'e-Commerce Metrics for Net-Enhanced Organizations: Assessing the Value of e-Commerce to Firm Performance in the Manufacturing Sector', *Information Systems Research*, vol. 13, no. 3, pp. 275-295.
Zhu, K & Kraemer, KL 2005, 'Post-adoption variations in usage and value of e-business by organizations: cross-country evidence from the retail industry', *Information Systems Research*, vol. 16, no. 1, pp. 61-84.
Zhu, K, Kraemer, KL, Xu, S & Dedrick, J 2004, 'Information Technology Payoff in E-Business Environments: An International Perspective on Value Creation of E-Business in the Financial Services Industry', *Journal of Management Information Systems*, vol. 21, no. 1, pp. 17-54.