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IT and Fast Growth Small-To-Medium Enterprise Performance: An Empirical Study in Australia

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Abstract

Information technology (IT) is regarded as a facilitator for both small and large firms to speed up transactions between firms and their suppliers and customers, achieve real-time communication, lower transaction costs, and enhance speed and flexibility. However, understanding whether and how IT helps small-to-medium enterprises (SMEs) to create business value still remains unclear. Drawing upon resource-based view theory, we develop and test a theoretical model to explore the interrelationships between IT resources (IT expertise, IT infrastructure), IT capability (IT integration), IT-enabled inter-firm processes (activity integration, coordination, partnership enhancement), and organizational performance in the fast growth SME context. We propose that IT business value depends on how SMEs employ IT resources to develop IT capability which facilitates inter-firm partnership processes along value chains. Structural equation modelling is employed to test our theoretical conceptualization of 310 Australian fast-growth SMEs across different industrial sectors. Results show that IT contributes to fast growth SME performance through the development of IT capability and enhancement of inter-firm partnership activities. This research highlights the role of IT in business value creation and the ways in which IT is used by fast growth SMEs to foster core business competencies.

Keywords: IT Resources/Capability, IT-enabled Inter-firm Processes, Resource-based View of Firms, Fast Growth SMEs.

1 Introduction

Information technology (IT) provides new ways for firms to conduct business with their suppliers and customers, helping companies to achieve real-time communication, coordinate inter-firm processes, enhance speed and flexibility, and ultimately improve business performance. Research into the use of IT is gaining significant attention in the information system (IS) area. Particularly since Carr (2003), IT business value has become a growing thematic line of enquiry. Today, more than ever, IS researchers face mounting pressures to address questions concerning whether and how IT investments lead to the creation of business value. Debate has focused predominantly on large firms, with comparatively scant attention paid to small-to-medium enterprises (SMEs). It is widely acknowledged that SMEs are the driving engines of most economies. Their survival and growth is imperative. For example, in Australia, 94% - 96% of businesses can be categorized as SMEs, employing approximately 3.5 million people and contributing to an estimated 30% of national GDP (OECD 2010). Fast growth enterprises represent a significant powerhouse in the small business sector, contributing substantially to wealth, income, and job creation (Gupta et al. 2013). Fast growth SMEs are entrepreneurially oriented, willing to take risks, to be innovative and to initiate

aggressive competitive actions, and grow faster than their industry sector average (Upton et al. 2001). Despite its importance, it appears that in the IS research field, there is a dearth of literature focusing on SMEs and perhaps surprisingly, research on fast growth SMEs is almost nonexistent. Therefore, understanding whether and how IT helps fast growth SMEs to gain business advantage remains enigmatic.

The present research attempts to address this gap in the literature. In this study, we define IT as the application of computers and telecommunications equipment to the storage, retrieval, transmission, and manipulation of data in a business or enterprise context (Lin & Lin 2008). IS refers to a system composed of people and computers that processes or interprets information (Saraf et al. 2007). SMEs are defined as businesses in which personnel numbers fall below 250 (Ghobadian & O'Regan 2000). Fast growth SMEs are those companies with an ability to take advantage of opportunities associated with unpredictable market, environmental, and economic conditions and thus achieving rapid sales turnover growth rates in a specific period (Barringer et al. 2005). Drawing upon the resource-based view of the firm (RBV) theory (Barney 1991), we theorize and explore the interrelationships between IT resources, IT capability, IT-enabled inter-firm partnership processes, and fast growth SME performance. RBV theory provides a theoretical platform upon which the indirect role of IT resources/capability in value creation can be explored through the effects of intermediate-level processes (Kim et al. 2011; Mithas et al. 2011). We posit that fast growth companies achieve business growth by strategically utilizing IT resources and IT capability which enable these firms to conduct inter-firm processes effectively and efficiently.

Our research heeds the call from researchers that further studies are needed to investigate the imperative role of IT in SME performance (Cragg et al. 2011; Cragg et al. 2013). We contribute further to the ongoing debate on IT business value by understanding IT value creation in the fast growth SME context and provide a solid theoretical framework to explain the interrelationships between variables. We examine the hypothesized linkages empirically based on data drawn from a survey of 310 fast growth Australian SMEs.

This paper is structured as follows. The literature review section synthesizes the extant IT and SME literature, which constitutes research background of this study. The theoretical background section introduces the tenets of RBV, which forms the backbone of our conceptual model for hypothesis formulation. The research method section outlines the procedures used for data collection, validation of the measurement properties of the constructs, and the test of the proposed research model. Next we present our findings and finally conclude with a discussion of findings, implications for research and practice, limitations and potential avenues for future research.

2 Literature Review

2.1 IT and SME Performance

Although several studies have investigated IT value in the SME context, our understanding of the nature of IT and how it impacts on SME performance still remains limited. For example, some studies (Bharadwaj & Soni 2007; Butler & Murphy 2008; Cragg et al. 2011; Cragg et al. 2013; Johnston et al. 2007; Oh et al. 2009; Wynn 2008; Zhang et al. 2008) provide empirical support for a positive relationship between IT and SME performance through achieving business process competencies, enabling innovation, and increasing revenue and decreasing costs. Others (Cragg et al. 2002; Hicks et al. 2006) suggest that the impact of IT on SME performance is weak. To some extent, these mixed findings are not surprising as many SMEs have resource constraints with limited financial resources and IT expertise and may be reluctant or unable to seek professional input (Cragg et al. 2013).

The mixed findings on IT-performance linkage can be also attributed to the absence of a comprehensive understanding of the underlying mechanisms through which IT improves SME performance. As IT is an enabler which facilitates the development of relationships between firms and their business partners, examining how IT impacts inter-firm competitive processes

and enhance firms' performance is imperative (Rai & Tang 2010). Researchers (Cragg et al. 2002; Levy & Powell 2005; Nieto & Fernández 2005) increasingly highlight that the value of IT can be realized when it is embedded in a SME's business processes through resource complementarities and co-specialization. For example, Mithas et al. (2011, p. 238) indicated that "the role and articulation of the underlying mechanisms through which IT capability improves firm performance remain unclear". Kim et al. (2011, p. 489) further proposed "that research on IT business value should investigate the effects of IT on business processes". Therefore, there is a need for fully exploring the relationship between IT and firm performance to improve our understanding of the mechanisms through which IT operates in the SME context.

In addition, most studies have treated IT resources and IT capability as a unified concept, which limits our understanding on the relationship between them. Therefore, unpacking the nature of IT into the specific types of IT resources and IT capability will provide a more fine-grained insight into the effects of IT resources and IT capability on SME performance and thus enrich the literature.

2.2 IT and Fast Growth SMEs

Firm growth is defined as meeting or exceeding performance goals in the form of growth in financial (sales revenue, growth in profitability and financial goals) and non-financial (increasing customer satisfaction) terms (Delmar & Wiklund 2008). Rapid growth is often regarded as an indication of market acceptance and firm success (Storey & Greene 2010). Firm growth has significant managerial salience as growing companies generally exhibit better cash flow and higher profitability (Anderson & Eshima 2013). Their ability to grow and establish themselves within their chosen markets in relatively brief periods makes fast growth enterprises an interesting target for academic research. A ground swell of interest in the strategic management literature have investigated the determinants of fast growth, identifying a range of internal (i.e., founder characteristics, resources, strategy & competencies) and external (i.e., alliances & access to capital) factors, as well as business practices related to their rapid growth (Audretsch et al. 2014; Gupta et al. 2013).

In relation to IT and SME growth, the literature suggests that fast growth companies differ from other SMEs and their larger counterparts in various ways. On the one hand, fast growth SMEs are entrepreneurially oriented and therefore are more likely than slow-growers to utilize new and advanced technologies as competitive tools (Khazanchi 2005; Raymond & Bergeron 2008; Storey & Greene 2010). Effective use of IT innovation enables SMEs to implement new strategies to support their core competences, thereby competing and growing in rapidly changing business environments by insulating themselves from their competitors (Raymond & Bergeron 2008; Uhlaner et al. 2013). On the other hand, compared with their larger counterparts, the flexible organizational structure and sound managerial skills in the growing SMEs guarantee the success of IT use which in turn has positive effects of firm growth (Hansen & Hamilton 2011; Mostafa et al. 2005; Nieto & Fernández 2005). However, limited research has been conducted to understand how IT helps SMEs to achieve rapid growth. Therefore, this study aims to address this significant gap in our current knowledge by exploring the role of IT resources and IT capability in helping SMEs to achieve growth through the improvements facilitated by IT-enabled inter-firm partnership processes.

3 Theoretical Background

Firm performance depends on the availability of, or access to, valuable, rare, inimitable, non-substitutable and relatively immobile resources or resource bundles (Barney 1991). The RBV theory suggests that organizations succeed and achieve competitive advantage through treatment of resources and capabilities as central considerations in strategy formulation and as primary sources of competitive advantage. According to the RBV, resources and capabilities represent two distinctive entities. While resources are used to create and produce products, capabilities are developed and emerge from utilization of resources in repeatable patterns (Edelman et al. 2005). Resources are generally regarded as inputs or outputs of organizational

processes, and are typically not embedded within those processes. Capabilities, however, are firm-specific and embedded in firm processes and routines, transforming inputs into outputs to generate value (Newbert 2007). Thus, capabilities are unique organizational processes developed to provide reliable services, create product innovations, generate operational flexibility, shorten product development cycles, and respond to evolving market trends (Woldesenbet et al. 2012). Makadok (2001, p. 387) posited that firms create value from two complementary, but distinct, mechanisms: "resource-picking" and "capability-building". Firms possessing bundles of advantage-generating resources and costly-to-imitate capabilities are regarded as fundamental drivers of superior performance.

The RBV theory has been employed in the IS field to explain how firms create value from IT (Dong et al. 2009; Wade & Hulland 2004; Zhu & Kraemer 2005). Although IT resources (e.g., hardware and software) are rarely drawn upon for the purpose of creating and sustaining competitive advantage, IT capability as a firm's ability to acquire, deploy, combine and configure IT resources in order to support and enhance business strategies and processes is hard to imitate, helping firms to achieve superior performance (Bharadwaj 2000; Mithas et al. 2011). In this study, we examine the role of two types of IT resources (i.e., IT expertise, IT infrastructure) in developing a specific IT capability: IT integration. IT expertise is the skills and knowledge of a firm's IT personnel (Cragg et al. 2013; Wade & Hulland 2004). IT infrastructure refers to physical IT assets including computers, communication facilities, shareable technical platforms, and databases (Roberts & Grover 2012). In the digitally-enabled business environment, IT integration refers to the IT-based linkages between the focal firm and its business partners which facilitate inter-firm business processes along the value chain (Rai & Tang 2010). Unlike the commodity technologies, IT integration is often associated with a firm's strategic context and is woven into the organization's fabric, which is not transparent to competitors (Zhang et al. 2008). Although competitors can easily mimic a firm's IT resources, the way companies effectively integrate IT within an organizational strategy so as to develop an IT capability is hard to acquire and difficult to imitate, thus providing firms with a source of competitive advantage.

The RBV theory also provides a lens through which we can understand IT value creation is "an indirect role for IT in firm performance. The basic logic is that IT affects other resources or processes which, in turn, lead to competitive advantage. Therefore, researchers may find it particularly beneficial to use intermediate-level dependent variables at the business process, department, or project level" (Wade & Hulland 2004, pp. 129-130). Following this logic, we examine the interconnections between IT resources, IT capability, IT-enabled inter-firm business processes, and SME performance. We posit that IT resources and IT capability provide fast growth SMEs with sources of advantage that help to differentiate these companies from competitors. Inter-firm business processes involve inter-organizational relationships, are drawn upon IT resources/capability, and are integrated with a firm's strategies. These activities enable fast growth SMEs to coordinate and improve inter-dependent processes in order to respond to customer preference and market changes, provide high quality products and services to meet customer needs. Thus these inter-organizational processes provide SMEs with core competences, helping firms to achieve growth. Moreover, fast growth SME research (Davidsson & Wiklund 1999; Ireland et al. 2003; Obeng et al. 2012) has extensively employed RBV theory to explain the imperative role of internal resources and organizational capability in the achievement of firm growth. Taken together, we argue that the RBV theory offers a solid theoretical foundation to explain how and why fast growth SMEs achieve competitive advantage not only from commonly available IT resources but also from the integration of these IT resources to form IT capability which can be leveraged to develop IT-enabled inter-mediated business routines residing in organizational skills and processes.

4 Research Model and Hypothesis Development

Figure 1 depicts a hypothesized model of IT resources, IT capability, IT-enabled inter-firm partnership processes, and SME performance, and is followed by a discussion and formulation of testable hypotheses.

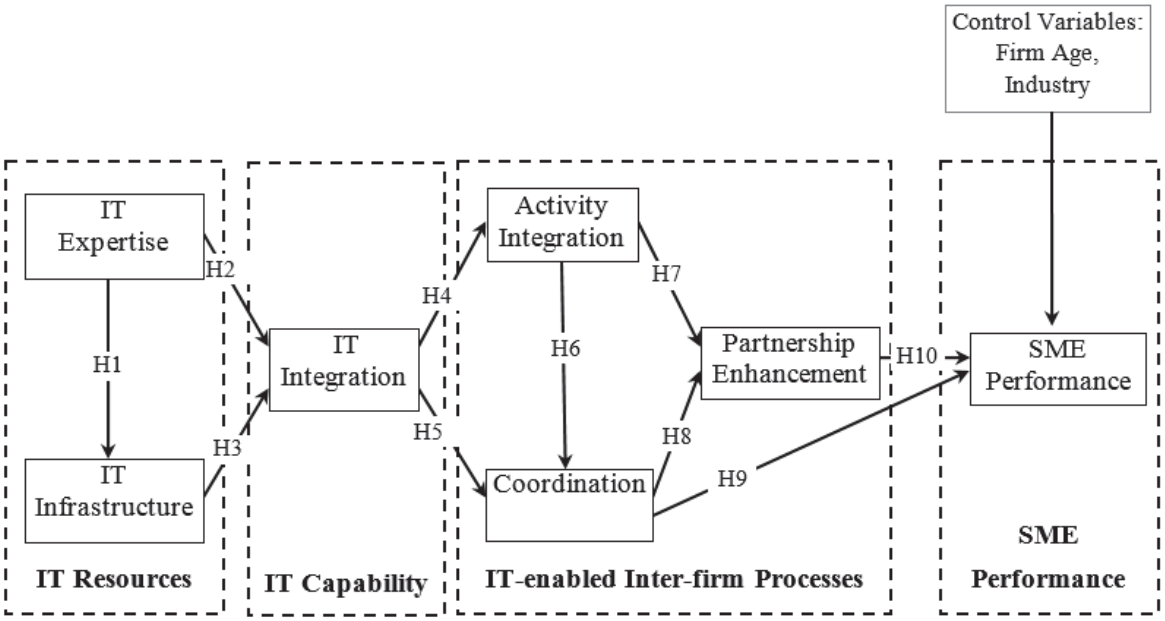

Figure 1. Research Model

While IT expertise refers to IT personnel who have specialized intellectual technical skills to develop IT applications that support business processes (Lin & Lin 2008), IT infrastructure is physical IT assets including computers, communication facilities, shareable technical platforms, and databases (Zhang et al. 2008). IT technical skills contain employees' knowledge of programming, system analysis and design, and competencies in emerging technologies. Compared with physical IT assets, the technical skills of IT employees are regarded as intangible and valuable firm resources which are more difficult to imitate by competitors and are likely to generate competitive advantage for firms (Wade & Hulland 2004). IS literature highlights the prominent role of IT human resources in successfully designing IT applications in line with business strategy in order to sustain business advantage. For example, Bhatt and Grover (2005) posited that IT employees with extensive business experience and skills in IS development enable firms to integrate IT strategy and business strategy, to develop reliable and cost-effective systems for businesses, and to anticipate business needs sooner than competitors. Fink and Neumann (2007) noted that firms with a high level of IT expertise is able to establish efficient communication between IT and business staff, to develop reliable and relevant business applications, and to align IT and business processes effectively. IT expertise is important for IS success in SMEs (Caldeira & Ward 2003; Cragg et al. 2013). Recent studies (Cragg et al. 2011; Cragg et al. 2013) suggest that more and more SMEs are able to develop a high level of IT expertise through gaining IT project experience over the years and by employing internal IT expertise. IT expertise is essential in enabling SMEs to develop technically an appropriate IT infrastructure platform on which to develop a technically superior IT integration functionality for integrating multiple internal as well as external (i.e., business partners, suppliers) databases (Cragg et al. 2011). Thus, we hypothesize that:

H1: IT expertise is related positively to the development of appropriate IT infrastructure platform.

H2: IT expertise is related positively to the development of IT integration.

IT infrastructure provides a solid and flexible platform upon which firms can leverage IT not only to conduct business activities but also to respond to customer demands and market changes for future business development (Roberts & Grover 2012). Dong et al. (2009) argued that digital business is unlikely to become an integral part of the value chain when firms lack appropriate IT infrastructure to readily and efficiently distribute necessary information for digital operations. In relation to the SME context, empirical research (Bharadwaj & Soni 2007;

Mostafa et al. 2005; Nieto & Fernández 2005) suggests that reliable and flexible IT infrastructure fosters strong links between SMEs and their business partners, leading to the development of robust IT integration. Thus, we hypothesize that:

H3: IT infrastructure is related positively to IT integration.

Activity integration is the extent to which firms collaborate with their value chains' partners on strategic planning and forecasting activities (Kim et al. 2006). Coordination refers to firms' ability to coordinate transactional related activities with their partners and suppliers (Wu et al. 2006). A technically sound IT integration with business partners and suppliers can increase transactional efficiencies, lower operation costs, and create business value for SMEs (Butler & Murphy 2008). SMEs with high levels of IT integration with their business partners can improve inter-firm business processes by establishing integrative, collaborative, and coordinative connections among value chain members (Arenius et al. 2005; Levy & Powell 2005). As an enabler for information processing, integration and coordination to facilitate cross-functional and multi-layer querying, IT integration is expected to help SMEs to achieve business value by facilitating information flow (Loane 2005), enhancing integrative business activities such as collaborative planning, forecasting, and replenishment (Raymond & Bergeron 2008), and improving coordination efficiency and reducing cost (Dyerson et al. 2009). Thus, we hypothesize that:

H4: IT integration is related positively to activity integration.

H5: IT integration is related positively to coordination.

A high level of activity integration among value chain members facilitates joint inter-firm processes such as joint production planning and sales forecasting, joint resource planning and work scheduling (Cao & Zhang 2011). In the context of digital business operations, empirical studies (Jansen et al. 2013; Theyel 2013) suggest that SMEs tend to integrate strategic business activities effectively with their trading partners in the value chain in order to achieve high level of coordination efficiency. SMEs employing strategic integration with their business partners are likely to increase coordination efficiency of production through close integration of decisions and operations (Voss & Voss 2013). Thus we hypothesize that:

H6: Activity integration is related positively to coordination.

The relational view of competitive advantage (Dyer & Hatch 2006) suggests that critical resources often span firm boundaries and are embedded in inter-firm routines and processes. This type of resources has great potential to generate a relational rent. Following this logic, we argue that IT-enabled inter-firm partnership activities facilitate rent generation by means of inter-firm relation-specific assets and inter-firm knowledge-sharing routines. IT can help firms to gain sustainable competitive advantage by facilitating communication, collaboration, and fostering relational capabilities (Rai & Tang 2010). Firms can achieve business advantage when they understand how to strategically employ IT to enhance collaboration and coordination activities, leading to the development of inter-firm complementary capabilities (Tallon & Pinsonneault 2011).

In the context of relationship development, the sustainability of strategic advantage depends on how IT is employed to foster inter-firm processes and to facilitate the development and use of complementary capabilities (Raymond & Bergeron 2008). Recent research (Jansen et al. 2013; Wynn 2008) demonstrates that the inter-firm collaboration and coordination helps SMEs to increase the intensity of, and enrich the quality of, its interactions with partners and suppliers, thus enhancing business relationship development. SMEs sharing important product planning and inventory information with value chain members on a regular and real-time basis are more likely to develop productive relationships than those who do not (Raymond & Bergeron 2008; Theyel 2013). In addition, an important precursor to effective and efficient inter-firm processes is the commitment of resources among value chain members to ensure that their business processes and systems are mutually compatible (Bharadwaj & Soni 2007). When the focal company's systems and online information repositories are integrated with those of its partners and suppliers, these parties are able to exhibit a greater commitment to

their mutual relationships (Du et al. 2012). Such commitment can, in turn, foster trusting, long-lasting relationships and can credibly signal the parties' intentions to ensure the long-term success of their business relationships (Eckhardt & Shane 2011; Jansen et al. 2013). Thus, we hypothesize that:

H7: Activity integration is related positively to partnership enhancement.

H8: Coordination is related positively to partnership enhancement.

Inter-firm collaboration and coordination is necessary to ensure performance (Kim & Lee 2010). Effective coordination not only reinforces a firm's ability to maintain, advance, and strengthen its relationships with value chain partners (Rai & Tang 2010), but also enables partner organizations in the value chain to share information in a timely manner, schedule procurement, production, and distribution operations synchronously, and respond to market changes swiftly (Kim & Lee 2010). Given that coordination is facilitated by the efficacy of a robust IT integration and a repetitive collaboration process, SMEs endowed with superior coordination competency can outperform competitors through efficient order handling procedures and short delivery lead time, therefore achieving improved performance (Eikebrokk & Olsen 2007; Levy & Powell 2005; Raymond & Bergeron 2008).

In the face of the increasing pace of change and complexity of business environments, it is imperative for SMEs to build strategic relationships in order to achieve sustainable value (Voss & Voss 2013). Building strategic relationships with business partners and suppliers not only enables SMEs to access to new technologies, markets, and complementary resources, but also to increase their responsiveness to market changes, fosters great knowledge seeking, and achieve synergetic rents (Carlo et al. 2012; Raymond & Bergeron 2008). Studies (Luo et al. 2008; Zhang et al. 2008) show that the higher level of collaboration in a relationship, the better business performance SMEs can achieve. In relation to the fast growth SME context, empirical research (Barringer et al. 2005; Hansen & Hamilton 2011; Uhlaner et al. 2013) suggests rapid growth SMEs tend to engage proactively in inter-organizational partnerships to build resources which provide another avenue to high growth. Thus, we hypothesize that:

H9: Coordination is related positively to SME performance.

H10: Partnership enhancement is related positively to SME performance.

5 Research Methodology

5.1 Target Population and Survey Sample

The data used for testing our proposed model was collected through an online survey of Australian fast-growth SMEs compiled by the present investigation for the Business Review Weekly (BRW). Key inclusion or exclusion criteria are: previous year's turnover must exceed AUD$500,000; fewer than 200 full-time employees; not a subsidiary of an Australian or overseas corporation; and must not receive more than 50% of their revenue from a single client. Companies provide signed and audited turnover figures over four consecutive financial periods in order to calculate average growth rates for ranking purpose. Growth is determined by average turnover over a four-year period using the fourth year as a baseline.

We have chosen to test our proposed model using fast-growth SMEs because SMEs comprise a dominant part of the global economy (OECD 2010). SMEs, in general, are relatively unsuccessful in exploiting the potential of digital business (Eikebrokk & Olsen 2007). Fast-growth SMEs, in comparison, are more entrepreneurial in their business orientation, are less risk averse, and have achieved leadership positions by leveraging their IT resources (Tiessen, Wright & Turner 2001).

5.2 Data Collection Procedures

A personalized email highlighting the academic nature of the current study was sent to either the founder or CEO of all 1,335 fast-growth SMEs on the BRW database. In our emails, we emphasized the importance of having respondents with a good understanding and overview of

their firm's e-business activities to participate in our survey, urging the founder or CEO to personally complete the online questionnaire, where possible. A follow-up email was sent three weeks after the initial one, and a second reminder email another two weeks later. Respondents were assured of confidentiality. A total of 310 responses were obtained in 2011, which gave a gross response rate of 28.1%, after discounting 195 incorrect email addresses and 32 SMEs which declined to participate. All responses were filled by either the company founder or its CEO.

We first tested the sample for non-response bias, using the approach suggested by Armstrong and Overton (1977). Differences in responses to all the constructs between early respondents (i.e., those that completed the survey upon the first invitation) and late respondents (i.e., those who replied to follow-up emails) were compared. Independent sample t-tests on each construct failed to reveal significant differences between early and late respondents (all *p*s>.05), suggesting that non-response bias was not an issue.

The profile of the responding firms in our study (Table 1) shows that our sample contains companies in all major industry sectors. There is also equal distribution of companies in terms of their age (or years of establishment). All responding firms had achieved a growth rate in excess of 20%.

	% (*n*=310)
Industry	
Information Technology	18.8
Property & Business Services	18.1
Personal & Other Services	9.6
Finance & Insurance	8.9
Communications	6.6
Others [a]	38
Company Age	
Less than 5 years	49
More than 5 years	51
Previous Year Growth Rate	21.9-759.5
CEO/Founder's Education Level	
Tertiary	53.9
MBA	16.6
Year 12	13.7
PhD or Doctorate	1.8
Other	14.0

Note. [a] Other industry sectors include Construction, Retail Trade, Manufacturing, Health & Community services, Wholesale Trade, Education, Transport & Storage, Accommodation, café, restaurants, Mining, Cultural & recreational services.

Table 1. Profile of Responding Firms

5.3 Common Method Bias

As our study used a self-administered questionnaire and respondents were in a senior management position qualified to assess firm performance, measurement was subject to cognitive biases due to participants "seeking to present themselves in a favourable manner" (Thompson & Phua 2005, p. 541). Anticipating such a possibility, we incorporated Marlowe and Crowne's (1961) Social Desirability Scale in our online questionnaire, inviting participants to complete this section as part of the survey. The incorporation of Marlowe and Crowne's

(1961) Social Desirability Scale in our questionnaire enabled us to assess all study items for social desirability response bias in order to address internal validity and psychometric aspects of instruments. Marlowe and Crowne's (1961) Social Desirability Scale has been used widely for checking cognitive biases (Ballard 1992).

In this study, we tested common method bias using SEM procedures recommended by Podsakoff et al. (2003). First, we conducted a Harman one-factor test to estimate the extent of the bias. Principal components analysis resulted in six components, accounting for 70.1% of the total variance. The first component explained only 37.1% of the variance, implying the absence of a dominant general factor that accounts for more than 50% of the variation. Second, this study controlled for the effects of a directly measured social desirability factor (i.e., the social desirability factor was linked to all endogenous variables). Results culminated in a poor fitting model entailing associations between social desirability and model parameters, with all path coefficients being close to zero and nonsignificant (all *p*s >.05). Accordingly, social desirability is not an issue in our sample. Based on these tests, we conclude that common methods bias is not a significant threat in our study.

5.4 Constructs

All the constructs and the corresponding measurement items were adapted from the literature (Table 2). All constructs were assessed with seven-point Likert scales ranging from *Strongly Disagree* (1) and *Strongly Agree* (7). Specifically, three items measuring IT expertise were adapted from Lin and Lin (2008). Three items measuring IT infrastructure were adapted from Zhu (2004). Three items measuring IT integration were adapted from Zhang et al. (2008). Three items measuring activity integration were adapted from Kim et al. (2006). Three items measuring coordination were adapted from Kim et al. (2006). Three items measuring partnership enhancement were adapted from Wu et al. (2003). Three items measuring SME performance were adapted from Dong et al. (2009). As control variables, we employed number of years since business start-up to measure firm age and used a series of industry dummies to control for exogenous factors at the industry level. Development of respective measurement models incorporate successive stages of theoretical modelling, statistical testing, and refinement (Straub 1989).

Constructs	Indicators
1. IT Expertise (ITEP) *Adapted from Lin and Lin (2008)*	Our company hires highly specialized or knowledgeable IT people. IT people working for our company are well aware of the multi-faceted functions of e-business. IT people working for our company are adequately trained in e-business.
2. IT Infrastructure (ITIF) *Adapted from Zhu (2004)*	Our company has a good telecommunication infrastructure. Our company has a good networking infrastructure. Our company has a flexible IT infrastructure for future development.
3. IT Integration (ITI) *Adapted from Zhang et al. (2008)*	Our company has integrated web applications encompassing different functional areas. Our company shares the databases for various applications. Our company has IT based links with external partners.
4. Activity Integration (AI) *Adapted from Kim et al. (2006)*	Our company collaborates actively in forecasting and planning with our business partners/suppliers. Our company projects and plans future demand collaboratively with our business partners/suppliers. Collaboration in demand forecasting and planning with our business partners/suppliers is something we always do.
5. Coordination (COOD) *Adapted from Kim et al. (2006)*	Our company conducts transaction follow-up activities more efficiently with our business partners/suppliers than do our competitors with theirs. Our company spends less time on supply chain coordination transactions with our business partners/suppliers than our competitors with theirs.

Constructs	Indicators
	Our company conducts coordination transactions at less cost than do our competitors with theirs.
6. Partnership Enhancement (PE) *Adapted from Wu et al. (2003)*	Our company is able to strengthen the existing business relationships with business partners/suppliers. Compared with our competitors, the relationships between our company and business partners/suppliers are likely to last longer. Our company is able to build up new business relationships with business partners/suppliers.
7. SME Performance (SP) *Adapted from Dong et al. (2009)*	Compared with our competitors, the market share of our products has increased. Compared with our competitors, the sales volume of our products has been increasing at a faster pace. Compared with our competitors, our sales market has widened significantly.

Table 2. Constructs and Indicators

5.5 Instrument Validation

Data were analysed with AMOS 19.0, using confirmatory factor analysis (CFA) procedures with the maximum likelihood (ML) estimation method. Prior to conducting the CFA, we ran an exploratory factor analysis (EFA) on all indicators. Principal axis factoring with direct oblimin rotation yielded consistent groupings with our hypothesized measurement models. All constructs were tested for reliability, validity, and fit. Based on an assessment of CFA fit statistics, measurement models were further refined to obtain sound fit. Respectively, Tables 3 and 4 show correlations and descriptive statistics and measurement properties of constructs. As reported below, instrument validation proceeded through four steps: calculation of construct reliability; variance extracted estimates; and evaluation of convergent and discriminant validity.

	Mean	SD	1	2	3	4	5	6	7
1. ITEP	4.95	1.69	**.83**						
2. ITIF	5.53	1.08	.48**	**.82**					
3. ITI	4.12	1.63	.52**	.39**	**.70**				
4. AI	4.30	1.64	.28**	.26**	.34**	**.95**			
5. COOD	4.40	1.24	.31**	.38**	.34**	.45**	**.85**		
6. PE	5.42	1.11	.21**	.24**	.20**	.37**	.38**	**.87**	
7. SP	5.32	1.21	.27**	.23**	.23**	.36**	.51**	.42**	**.86**

Note. (1) *p<.05. **p<.01.
(2) The diagonal elements are the square root of the AVE.

Table 3. Correlation Matrix, Mean Scores and Standardized Deviations

Constructs	Cronbach's α	Construct Reliability	Variance Extraction	Range of Standardized Loadings	Range of Indicator Reliability
1. ITEP	.86	.87	.69	.75-.94	.57-.90
2. ITIF	.83	.89	.66	.74-.89	.54-.76
3. ITI	.75	.74	.50	.65-.77	.43-.60
4. AI	.75	.74	.50	.65-.81	.42-.66
5. COOD	.87	.89	.73	.83-.93	.58-.82
6. PE	.95	.89	.72	.71-.93	.58-.82
7. SP	.86	.87	.69	.67-.80	.57-.84

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

Table 4. Confirmatory Factor Analysis: Standardized Loadings and Reliability

5.5.1 Construct Reliability

Construct reliability, a measure of consistency, assesses the degree to which items are free from random error. Indictor and composite reliability are two measures of construct reliability (Fornell & Larcker 1981). While indicator reliability represents the proportion of variation that is explained by a construct it purports to measures, composite reliability reflects the internal consistency of indicators (Werts et al. 1974). In the present study, indicator reliability values range between .50 and .88, and composite reliability values exceed the recommended value of .70 (Nunnally & Bernstein 1994).

5.5.2 Variance Extracted Estimate

Variance extracted estimate reflects the overall amount of variance in indicators accounted for by a latent construct (Fornell & Larcker 1981). In this study, all estimates exceed the recommended value of .50 (Hair et al. 2006).

5.5.3 Construct Validity

Construct validity was established by measuring convergent and discriminant validity of measurement items (Phillips & Bagozzi 1986). Convergent validity assesses the consistency across multiple operationalisations. Values for t-statistics for all factor loadings were found to be significant (all ps<.001), indicating that measures satisfy convergent validity criteria (Gefen et al. 2000). According to Fornell and Larcker (1981), average variance extracted for each construct should be greater than the squared correlation between constructs when assessing discriminant validity, the extent to which different constructs diverge from one another. In this

case, the results suggest that items share more common variance with related than non-related constructs, with all constructs meeting this criterion.

5.6 Data Analysis

Confirmatory and full structural model fit were assessed using multiple indices (Hair et al. 2006), including the normed chi-square (χ^2/df), comparative fit index (CFI), Tucker-Lewis Index (TLI), standardized root mean-square residual (SRMR), and root mean-square error of approximation (RMSEA). All seven 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).

6 Results

Given the acceptable measurement models, we estimated a full latent variable structural model using same goodness of fit criteria to test our structural model and respective hypotheses. Table 5 summarizes the results of hypotheses testing, revealing reliable and robust fit between our theoretical model and sample covariances: $\chi^2(179)=346.348$, $\chi^2/df=1.935$, CFI=.960, TLI=.953, SRMR=.062, RMSEA=.055. These indices suggest a good model fit. The squared multiple correlation (SMC) values, which are similar to R^2 in regression analysis, show that this model accounts for 32% of the variance in IT infrastructure, 45% of the variance in IT integration, 17% of the variance in activity integration, 31% of the variance in coordination, 24% of the variance in partnership enhancement, and 44% of the variance in SME performance. None of the control variables showed significant effects in the research model. Table 5 shows that all hypothesized relationships are supported.

Hypothesis	Standardized Paths Estimates	Conclusion
H1: IT Expertise → IT Infrastructure	.56***	Supported
H2: IT Expertise → IT Integration	.51***	Supported
H3: IT Infrastructure → IT Integration	.24**	Supported
H4: IT Integration → Activity Integration	.41***	Supported
H5: IT Integration → Coordination	.26***	Supported
H6: Activity Integration → Coordination	.35***	Supported
H7: Activity Integration → Partnership Enhancement	.28***	Supported
H8: Coordination → Partnership Enhancement	.25***	Supported
H9: Coordination → SME Performance	.23***	Supported
H10: Partnership Enhancement → SME Performance	.53***	Supported
Model Fit Indices $\chi^2(179)=346.348$, $\chi^2/df=1.935$, CFI=.960, TLI=.953, SRMR=.062, RMSEA=.055		

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

Table 5. Proposed Hypotheses and Test Results

7 Discussion

Aiming to address understudied issues about IT and fast growth SME performance, this research develops and empirically tests a hypothesized theoretical model integrating IT resources, IT capability, IT-enabled inter-firm partnership activities, and organizational performance. The RBV theory underpins the present research. Results show that all ten hypothesized relationships are supported, suggesting that IT can help fast growth SMEs to achieve business success through the development of IT integration capability and IT-enabled

inter-firm partnership processes. This study provides six insights significantly contributing to theory, IS research, and business practices.

First, this study develops, theorizes, and empirically validates an integrated theoretical model to investigate inter-relationships among IT resources, IT capability, IT-enabled inter-firm processes, and fast growth SME performance. Our results highlight that IT resources and IT capability are sources of advantage, helping fast growth SMEs to achieve business value through facilitating inter-firm business processes. Because transaction-specific know how and inter-firm knowledge-sharing routines are socially complex advantages subject to considerable causal ambiguity and time-compression diseconomies, these inter-firm processes are difficult to replicate, providing positional advantage for firms to outperform their competitors (Saraf et al. 2007). Through exploring the entire net containing IT resources, IT capability, and implications of IT resources/capability, this research empirically tests the application of RBV theory, thus offering a sharp theoretical lens to view the phenomena in IT business value creation.

Second, this study contributes to IS literature by synthesizing resource-picking and capability-building mechanisms to investigate how IT resources help fast growth SMEs to build IT capability which in turn leads to business value. Although the RBV theory emphasizes the possession of rare, valuable, and inimitable resources as drivers of competitive advantage (Barney 1991), recent theorizing argues that capability-building processes are more significant than resource-picking processes (Kim et al. 2011). It is noteworthy, however, that ex ante studies of impact of IT resources on IT capability and SME performance largely overlook resource-picking and capability-building mechanisms. To bridge this apparent gap in the literature, we disaggregate IT resources into IT expertise and IT infrastructure and explore the synergistic effects of these two IT resources on the development of IT integration capability. Our results suggest that IT expertise with superior knowledge about business strategy, competition, and opportunities are the origin of source of advantage, helping fast growth SMEs to renew and redevelop existing resources/capability and create strategic value. Examinations of the direct relationship between IT resources/capability and SME performance are unlikely to generate such insights.

Third, our results indicate that IT integration has a substantial effect on inter-firm process-level performance along the value chain. This finding highlights that IT business value depends on how fast growth SMEs effectively employ technology to improve value chain operations. According to the RBV theory, in competitive environments, it is imperative for firms to develop their ability to integrate resources into bundles of organizational capabilities which are difficult to imitate and confer firms with superior performance (Eisenhardt & Martin 2000; Teece et al. 1997). Consistent with this logic, IS researchers (Kim et al. 2013; Mithas et al. 2011) suggest that although commonly available IT resources cannot by themselves create sustained performance gains for firms, IT capability can provide firms with business advantage because it involves a long-term development process and requires firms to make a series of linked strategic decisions and moves related to IT resources so as to blend them with organizational processes and knowledge resources.

Our results indicate that inter-firm partnership activities such as activity integration, coordination, and relationship enhancement processes are achieved through the deep embedding of integrated IT capability as process enablers. The development of such IT-enabled inter-firm partnership capability that leverages IT infrastructure integration requires significant time, substantial expertise spanning the business process domain, partnership context, and IT, the perspective of which makes it hard for competitors to imitate. The fundamental role of IT in value chain management is not only to provide speed and flexibility, but also to facilitate a close linkage in key processes among value chain members so as to create strategic value in extended organizations (Kim et al. 2013; Rai et al. 2012). Although the role of IT integration in enabling process efficiencies is well understood in IS literature, its role in enhancing knowledge sharing and recombination across SMEs needs to be further explored using more granular constructs. Therefore, our results provide an implication for IS research,

suggesting the usefulness to gauge intermediate firm performance and probe into the specific ways that IT is used to improve business processes.

Fourth, our results suggest that IT-enabled integration and coordination processes are positively related to partnership enhancement and fast growth SME performance. These findings confirm the relational view of competitive advantage which provides a valuable theoretical lens to investigate the ways in which inter-firm partnership activities influence business-related performance. Recent research (Bharadwaj et al. 2013) underscores that in the digitally enabled business environment, the emergence of a new model of competitive strategy stems from how firms effectively manage value chains through integration of inter-firm processes across partner organizations. Our findings highlight that sustainability of strategic advantage depends upon how IT is used to foster collaborative processes between fast growth SMEs and their business partners, and facilitate the development and use of complementary capabilities.

Fifth, this study contributes to IS research by investigating the business value of IT in the fast growth SME context. Compared with their larger counterparts, research targeting fast growth SMEs is almost non-existent in the IS field. Fast growth SMEs are entrepreneurially-oriented, willing to seek competitive opportunities to add profitable value to their products or services (Barringer et al. 2005). The seminal work of Penrose (1959, p. 217) suggests that the "amount of resources administered by a firm has in itself a significant influence on the opportunities for expansion open to the firm", highlighting that when a firm is entrepreneurial, the existence of resources promotes firm growth. Recently, Cragg et al. (2011) argued that technical IT skills can be regarded as a source of competitive advantage in SMEs, helping firms to create competencies and thus achieve business goals. Our findings lend support to these views, indicating that entrepreneurial SMEs adopt a proactive IT stance, employ a high level of IT expertise to experiment and explore new and available technologies in order to exploit existing competencies, address, and create new business opportunities.

Finally, this study contributes to practice by providing a useful integrative framework for fast growth SME managers to understand the ways in which IT investments help firms to create strategic advantage and achieve business performance. Sources of competitive advantage, be they technological or organizational, do not guarantee competitive advantage. It is the ways in which firms combine these qualities to develop unique organizational capabilities to achieve superior business advantage. SME managers are advised to examine external industry contexts, firm-specific IT resources, and core processes that foster the development of organizational capabilities that form part of corporate strategies and growth.

This study offers three important implications for fast growth SME managers. First, our model identifies that IT human resources and IT infrastructure are critical for fast growth SMEs to compete and succeed in the digitally enabled business environments. It is essential that fast growth SME managers take these IT resources into account when transforming their physical supply chains into those based on digital connections and information flow. Particularly, fast growth SME managers need to understand the important role of IT integration in achieving seamless information flow among various information systems and databases both internally and externally across the production, supply, and distribution networks. This will become even more important as competition intensifies.

Second, this study highlights that resources/capabilities become sources of advantage only when they are exploited through business processes. Fast growth SME managers should assign a high priority to the identification of resource competencies that have strong potential for developing specific IT capability and focus on appropriate business processes where IT capability is deployed.

Third, fast growth SME managers should bear in mind that establishing information-linked strategic alliances with business partners and suppliers is critical. In the current turbulent business environments, fast growth SMEs have to learn to build strategic partnerships with their value chain partners so as to leverage the external resource provided by business partners and thus gain relational benefits.

8 Limitations and Conclusion

This study has four notable limitations. First, a cross-sectional research design was adopted with data collected at a single point in time. IT-enabled business processes and competencies are dynamic. Firms require time to reconfigure their resources to adapt to changes in the technological and business environments. Future research might consider using longitudinal designs to address issues relating to the evolution of IT-enabled processes and the development of core business competency.

Second, utilizing a single-informant (CEO and/or founder) in each responding company presents issues of data credibility. Single informant studies are well-known for their susceptibility to reporting bias. Future research might consider obtaining data from managers across the IT, marketing, and operational functions.

A third limitation relates to sample characteristics upon which the present hypotheses are tested. The current investigation is drawn from a relatively small proportion of self-selected fast-growth SMEs in a specific geographic region. While the present hypothesized model might be applicable to larger firms as well as firms in other geographic locales, further research is needed to expand the generalizability of the findings.

Finally, the present study only explores the impact of IT resources/capability in enhancing SME performance. Future research might consider extending the current investigation and explore other elements such as how culture, structure, and entrepreneurial leadership interact with IT in enabling firm performance. Including these variables could offer significant improvements over the current model, providing a more comprehensive understanding of the value of IT complementary resources and capabilities.

Understanding whether and how IT helps firms to create business value is an ongoing debate among both researchers and business practitioners. However, most studies target larger corporations with scant attention paid to SMEs. We sought to better understand this understudied link between IT and business performance within the SME context. We examine the role of two specific IT resources: IT expertise and IT infrastructure in business value creation. We argue that IT resources and IT capability, as sources of advantage, help fast growth SMEs to develop core competences over competitors by improving inter-firm partnership activities which in turn create business value. The current findings demonstrate that fast growth SMEs foster, nurture, and develop firm-wide IT capability by successfully managing and leveraging their IT resources in such a way as to achieve business success. In the light of the ongoing debate about the business value of IT, we hope this study motivates further discussion and encourages the advancement of theory that helps us to improve our understanding of the dynamics of IT and its relationship to organizational performance in the SME context.

References

Anderson, B.S. & Eshima, Y. (2013) "The influence of firm age and intangible resources on the relationship between entrepreneurial orientation and firm growth among Japanese SMEs", *Journal of Business Venturing*, **28**(3): 413-429.

Arenius, P., Sasi, V. & Gabrielsson, M. (2005) "Rapid internationalisation enabled by the Internet: The case of a knowledge intensive company", *Journal of International Entrepreneurship*, **3**(4): 279-290.

Armstrong, J.S. & Overton, T.S. (1977) "Estimating Nonresponse Bias in Mail Surveys", *Journal of Marketing Research*, **14**(3): 396-402.

Audretsch, D., Coad, A. & Segarra, A. (2014) "Firm growth and innovation", *Small Business Economics*, **43**(4): 743-749.

Barney, J.B. (1991) "Firm Resources and Sustained Competitive Advantage", *Journal of Managment*, **17**(1): 99-120.

Barringer, B.R., Jones, F.F. & Neubaum, D.O. (2005) "A quantitative content analysis of the characteristics of rapid-growth firms and their founders", *Journal of Business Venturing*, **20**(5): 663-687.

Bharadwaj, A., El Sawy, O.A., Pavlou, P.A. & Venkatraman, N. (2013) "Digital Business Strategy: Toward a Next Generation of Insights", *MIS Quarterly*, **37**(2): 471-482.

Bharadwaj, A.S. (2000) "A Resource-based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation", *MIS Quarterly*, **24**(1): 169-196.

Bharadwaj, P.N. & Soni, R.G. (2007) "E-Commerce Usage and Perception of E-Commerce Issues among Small Firms: Results and Implications from an Empirical Study*", *Journal of Small Business Management*, **45**(4): 501-521.

Bhatt, G.D. & Grover, V. (2005) "Types of Information Technology Capabilities and Their Role in Competitive Advantage: An Empirical Study", *Journal of Management Information Systems*, **22**(2): 253-277.

Butler, T. & Murphy, C. (2008) "An exploratory study on IS capabilities and assets in a small-to-medium software enterprise", *Journal of Information Technology*, **23**(4): 330-344.

Caldeira, M.M. & Ward, J.M. (2003) "Using resource-based theory to interpret the successful adoption and use of information systems and technology in manufacturing small and medium-sized enterprises", *European Journal of Information Systems*, **12**(2): 127-141.

Cao, M. & Zhang, Q. (2011) "Supply chain collaboration: Impact on collaborative advantage and firm performance", *Journal of Operations Management*, **29**(3): 163-180.

Carlo, J.L., Lyytinen, K. & Rose, G.M. (2012) "A knowledge-based Model of Radical Innovation in Small Software Firms", *MIS Quarterly*, **36**(3): 865-A810.

Carr, N.G. (2003) "IT Doesn't Matter", *Harvard Business Review*, **81**(5): 41-49.

Cragg, P., Caldeira, M. & Ward, J. (2011) "Organizational information systems competences in small and medium-sized enterprises", *Information & Management*, **48**(8): 353-363.

Cragg, P., King, M. & Hussin, H. (2002) "IT alignment and firm performance in small manufacturing firms", *The Journal of Strategic Information Systems*, **11**(2): 109-132.

Cragg, P., Mills, A. & Suraweera, T. (2013) "The Influence of IT Management Sophistication and IT Support on IT Success in Small and Medium-Sized Enterprises", *Journal of Small Business Management*, **51**(4): 617-636.

Davidsson, P. & Wiklund, J. (1999) *Theoretical and Methodological Issues in the Study of Firm Growth*, Jönköping International Business School, Sweden.

Delmar, F. & Wiklund, J. (2008) "The Effect of Small Business Manager's Growth Motivation on Firm Growth: A Longitudinal Study", *Entrepreneurship: Theory & Practice*, **32**(3): 437-457.

Dong, S., Xu, S.X. & Zhu, K. (2009) "Information Technology in Supply Chain: The Value of IT-Enabled Resources Under Competition", *Information Systems Research*, **20**(1): 18-32.

Du, T.C., Lai, V.S., Cheung, W. & Cui, X. (2012) "Willingness to share information in a supply chain: A partnership-data-process perspective", *Information & Management*, **49**(2): 89-98.

Dyer, J.H. & Hatch, N.W. (2006) "Relation-specific capabilities and barriers to knowledge transfers: creating advantage through network relationships", *Strategic Management Journal*, **27**: 701-719.

Dyerson, R., Harindranath, G. & Barnes, D. (2009) "National Survey of SMEs' Use of IT in Four Sectors", *The Electronic Journal Information Systems Evaluation*, **12**(1): 39-50.

Eckhardt, J.T. & Shane, S.A. (2011) "Industry changes in technology and complementary assets and the creation of high-growth firms", *Journal of Business Venturing*, **26**(4): 412-430.

Edelman, L.F., Brush, C.G. & Manolova, T. (2005) "Co-alignment in the resource-performance relationship: strategy as mediator", *Journal of Business Venturing*, **20**(3): 359-383.

Eikebrokk, T.R. & Olsen, D.H. (2007) "An empirical investigation of competency factors affecting e-business success in European SMEs", *Information & Management*, **44**(4): 364-383.

Eisenhardt, K.M. & Martin, J.A. (2000) "Dynamic capabilities: What are they?", *Strategic Management Journal*, **21**(10/11): 1105-1121.

Fink, L. & Neumann, S. (2007) "Gaining Agility through IT Personnel Capabilities: The Mediating Role of IT Infrastructure Capabilities", *Journal of the Association for Information Systems*, **8**(8): 440-462.

Fornell, C. & Larcker, D.F. (1981) "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error", *Journal of Marketing Research*, **18**(1): 39-50.

Gefen, D., Straub, D.W. & Bourdreau, M.C. (2000) "Structural Equation Modeling and Regression: Guidelines for Research Practices", *Communications of the AIS*, **4**(7): 1-78.

Gupta, P., Guha, S. & Krishnaswami, S. (2013) "Firm growth and its determinants", *Journal of Innovation and Entrepreneurship*, **2**(1): 1-14.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. & Tatham, R.L. (2006) *Multivariate Data Analysis*, Prentice Hall, New Jersey.

Hansen, B. & Hamilton, R.T. (2011) "Factors distinguishing small firm growers and non-growers", *International Small Business Journal*, **29**(3): 278-294.

Hicks, B.J., Culley, S.J. & McMahon, C.A. (2006) "A study of issues relating to information management across engineering SMEs", *International Journal of Information Management*, **26**(4): 267-289.

Ireland, R.D., Hitt, M.A. & Sirmon, D. (2003) "A model of strategic entrepreneurship: The construct and its dimensions", *Journal of Management*, **29**(6): 963-989.

Jansen, R.J.G., Curşeu, P.L., Vermeulen, P.A.M., Geurts, J.L.A. & Gibcus, P. (2013) "Information processing and strategic decision-making in small and medium-sized enterprises: The role of human and social capital in attaining decision effectiveness", *International Small Business Journal*, **31**(2): 192-216.

Johnston, D.A., Wade, M. & McClean, R. (2007) "Does e-Business Matter to SMEs? A Comparison of the Financial Impacts of Internet Business Solutions on European and North American SMEs", *Journal of Small Business Management*, **45**(3): 354-361.

Khazanchi, D. (2005) "Information Technology (IT) Appropriateness: The Contingency Theory of "Fit" and IT Implementation in Small and Medium Enterprise", *Journal of Computer Information Systems*, **45**(3): 88-95.

Kim, D., Cavusgil, S.T. & Calantone, R.J. (2006) "Information System Innovations and Supply Chain Management: Channel Relationships and Firm Performance", *Journal of the Academy of Marketing Science*, **34**(1): 40-54.

Kim, D. & Lee, R.P. (2010) "Systems Collaboration and Strategic Collaboration: Their Impacts on Supply Chain Responsiveness and Market Performance", *Decision Sciences*, **41**(4): 955-981.

Kim, G., Shin, B., Kim, K.K. & Lee, H.G. (2011) "IT Capabilities, Process-Oriented Dynamic Capabilities, and Firm Financial Performance", *Journal of the Association for Information Systems*, **12**(7): 487-517.

Kim, G., Shin, B. & Kwon, O. (2013) "Investigating the Value of Sociomaterialism in Conceptualizing IT Capability of a Firm", *Journal of Management Information Systems*, **29**(3): 327-362.

Levy, M. & Powell, P. (2005) *Strategies for Growth in SMEs: The Role of Information and Information Systems*, Elsevir Butterworth-Heinemann, Oxford.

Lin, H.F. & Lin, S.M. (2008) "Determinants of e-business diffusion: A test of the technology diffusion perspective", *Technovation*, **28**: 135-145.

Loane, S. (2005) "The role of the internet in the internationalisation of small and medium sized companies", *Journal of International Entrepreneurship*, **3**(4): 263-277.

Luo, X., Hsu, M.K. & Liu, S.S. (2008) "The moderating role of institutional networking in the customer orientation-trust/commitment-performance causal chain in China", *Academy of Marketing Science. Journal*, **36**(2): 202-214.

Makadok, R. (2001) "Toward a synthesis of the Resource-Based and Dynamic-Capability views of rent creation", *Strategic Management Journal*, **22**(5): 387-401.

Marlowe, D. & Crowne, D.P. (1961) "Social desirability and response to perceived situational demands", *Journal of Consulting Psychology*, **25**: 109-115.

Mithas, S., Ramasubbu, N. & Sambamurthy, V. (2011) "How Information Management Capability Influences Firm Performance", *MIS Quarterly*, **35**(1): 237-256.

Mostafa, R.A., Wheeler, C. & Jones, M. (2005) "Entrepreneurial orientation, commitment to the Internet and export performance in small and medium sized exporting firms", *Journal of International Entrepreneurship*, **3**(4): 291-302.

Newbert, S.L. (2007) "Empirical research on the resource-based view of the firm: an assessment and suggestions for future research", *Strategic Management Journal*, **28**(2): 121-146.

Nieto, M. & Fernández, Z. (2005) "The role of information technology in corporate strategy of small and medium enterprises", *Journal of International Entrepreneurship*, **3**(4): 251-262.

Nunnally, J.C. & Bernstein, I.H. (1994) *Psychometric Theory*, McGraw Hill, New York.

Obeng, B.A., Robson, P. & Haugh, H. (2012) "Strategic entrepreneurship and small firm growth in Ghana", *International Small Business Journal*, **32**(5): 501-524.

OECD (2010) *SMEs, Entrepreneurship and Innovation*, OECD Publishing. Available at: http://www.oecd.org/cfe/smesentrepreneurshipandinnovation.htm

Oh, K.-Y., Cruickshank, D. & Anderson, A.R. (2009) "The adoption of e-trade innovations by Korean small and medium sized firms", *Technovation*, **29**(2): 110-121.

Penrose, E.T. (1959) *The theory of the growth of the firm*, Oxford University Press, Oxford.

Phillips, L. & Bagozzi, R. (1986) "Assessing Measurement Error in Key Informant Reports: A Methodological Note on Organizational Analysis in Marketing", *Journal of Marketing Research*, **18**: 395-415.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y. & Podsakoff, N.P. (2003) "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies", *Journal of Applied Psychology*, **88**(5): 879-903.

Rai, A., Pavlou, P.A., Im, G. & Du, S. (2012) "Interfirm IT Capability Profiles And Communications For Cocreating Relational Value: Evidence From The Logistics Industry", *MIS Quarterly*, **36**(1): 233-A235.

Rai, A. & Tang, X. (2010) "Leveraging IT Capabilities and Competitive Process Capabilities for the Management of Interorganizational Relationship Portfolios", *Information Systems Research*, **21**(3): 516-542.

Raymond, L. & Bergeron, F. (2008) "Enabling the business strategy of SMEs through e-business capabilities: A strategic alignment perspective", *Industrial Management & Data*, **108**(5): 577-595.

Roberts, N. & Grover, V. (2012) "Leveraging Information Technology Infrastructure to Facilitate a Firm's Customer Agility and Competitive Activity: An Empirical Investigation", *Journal of Management Information Systems*, **28**(4): 231-270.

Saraf, N., Langdon, C.S. & Gosain, S. (2007) "IS Application Capabilities and Relational Value in Interfirm Partnerships", *Information Systems Research*, **18**(3): 320-339.

Storey, D.J. & Greene, F.J. (2010) *Small Business and Entrepreneurship*, Pearson Education, Harlow.

Straub, D.W. (1989) "Validating Instruments in MIS Research", *MIS Quarterly*, **13**(2): 147-169.

Tallon, P.P. & Pinsonneault, A. (2011) "Competing Perspectives On The Link Between Strategic Information Technology Alignment And Organizational Agility: Insights From A Mediation Model", *MIS Quarterly*, **35**(2): 463-486.

Teece, D.J., Pisano, G. & Shuen, A. (1997) "Dynamic capabilities and strategic management", *Strategic Management Journal*, **18**(7): 509-533.

Theyel, N. (2013) "Extending open innovation throughout the value chain by small and medium-sized manufacturers", *International Small Business Journal*, **31**(3): 256-274.

Thompson, E.R. & Phua, F.T.T. (2005) "Reliability among Senior Managers of the Marlowe-Crowne Short-Form Social Desirability Scale", *Journal of Business and Psychology*, **19**(4): 541-554.

Uhlaner, L., van Stel, A., Duplat, V. & Zhou, H. (2013) "Disentangling the effects of organizational capabilities, innovation and firm size on SME sales growth", *Small Business Economics*, **41**(3): 581-607.

Upton, N., Teal, E.J. & Felan, J.T. (2001) "Strategic and Business Planning Practices of Fast Growth Family Firms", *Journal of Small Business Management*, **39**(1): 60-72.

Voss, G.B. & Voss, Z.G. (2013) "Strategic Ambidexterity in Small and Medium-Sized Enterprises: Implementing Exploration and Exploitation in Product and Market Domains", *Organization Science*, **24**(5): 1459-1477.

Wade, M. & Hulland, J. (2004) "Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research", *MIS Quarterly*, **28**(1): 107-142.

Werts, C., Linn, R. & Jöreskog, K. (1974) "Interclass Reliability Estimates: Testing Structural Assumptions", *Educational and Psychological Measurement*, **34**(1): 25-33.

Woldesenbet, K., Ram, M. & Jones, T. (2012) "Supplying large firms: The role of entrepreneurial and dynamic capabilities in small businesses.", *International Small Business Journal*, **30**(5): 493-512.

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*, **31**(4): 425-447.

Wu, F., Yeniyurt, S., Kim, D. & Cavusgil, S.T. (2006) "The impact of information technology on supply chain capabilities and firm performance: A resource-based view", *Industrial Marketing Management*, **35**(4): 493-504.

Wynn, M. (2008) "Information systems strategy development and implementation in SMEs", *Management Research News*, **32**(1): 78-90.

Zhang, M., Sarker, S. & Sarker, S. (2008) "Unpacking the effect of IT capability on the performance of export-focused SMEs: a report from China", *Information Systems Journal*, **18**(4): 357-380.

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*, **21**(1): 167-202.

Zhu, K. & Kraemer, K.L. (2005) "Post-adoption variations in usage and value of e-business by organizations: cross-country evidence from the retail industry", *Information Systems Research*, **16**(1): 61-84.