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A Literature Analysis on the Relationship between External Integration, Environmental Uncertainty and Firm Performance in Malaysian SMEs

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Abstract

The effect of environmental uncertainty (EU) on the relationship between external integration and firm performance is examined for small- and medium-sized enterprises (SMEs) in Malaysia. Uncertainty is a changeability state of the environment including uncertain market, failure to forecast the impact of changes in environmental, and unable to expect the outcomes of a response choice. SMEs have scarcity resources in terms of financial, skills, knowledge and technology; therefore, the sustainable business successes of SMEs hinge more on suppliers' capabilities and co-operative relationships as well as customer integration. Since SMEs operate under highly competitive environment, thus SMEs need to monitor their environment to identify potential collaborative opportunities with suppliers and customers. In addition, the close relationships with suppliers and customers allow SMEs to access to the latest process, technologies, materials and other methods of innovation. Particularly, there is a lack of studies that investigate the effect of EU on the external integration-firm performance relationship in Malaysian SMEs of manufacturing industry. As such, the implications of the three sources of uncertainty – demand uncertainty, technological uncertainty and competitive threats are discussed. Ultimately, this study could enrich the existing body of knowledge in supply chain integration, EU and performance of SMEs in the manufacturing industry.

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Keywords: External integration; enironmental uncertainty; firm performance; small- and medium-sized enterprises

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1. Introduction

Small- and medium-sized enterprises (SMEs) form the potential economic back-bone of many regions and make a greater contribution to employment than large firms (Peng, 2009). A similar trend also exists in Malaysia, where SMEs constitute 97.3% of businesses and have the potential to be a powerful engine for growth and innovation (SME Annual Report, 2011/12). Malaysian SMEs are distributed in four broad economic segments: services, manufacturing, basic raw material producers and agriculture (Hashim, 2007). In terms of gross domestic product (GDP), SMEs contributed 32.5% of the GDP in 2011 and recorded a relatively strong GDP (6.8%) compared with the overall economy (5.1%). The manufacturing sector achieved the highest growth (7.6%), followed by both the agriculture and services sectors (both 6.4%) (SME Annual Report, 2011/12). However, if compared with industrial and other developing countries, the contribution of SMEs to the Malaysian economy is relatively low. Developed countries such as Japan and Germany have a contribution of more than 50% GDP. Even in developing country such as Thailand, SMEs play a significant role in the economy with 38% of GDP (SME Annual Report, 2009/10). Since SMEs are important growth engines in many countries, there is a great potential for Malaysian SMEs to develop into the most significant domestic source of growth through supply chain integration.

External integration is now the prevalent practice of supply chain integration across all firms. External integration refers to supplier and customer integration which focuses on dense and interactive relationships development with suppliers and customers. Company extends its scope of firm integration to integrate with supplier and customer through information sharing and collaborative relationship (Stevens, 1989). External integration is a joint collaborative effort between a manufacturer partner and its external partners to develop mutually agreed inter-organisational processes, practices and strategies (Stank et al., 2001). The external integration is trio-fold dimensional: information integration, coordination and organisational linkages to share risks, costs and gains (Lee, 2000). Integrating with supplier is considered the most prevalent practice of supply chain integration (Fawcett and Magnan, 2002). Supplier integration is the interaction between firms and their suppliers in the effort of information sharing, effective alignment and participation (Ragatz et al., 2002). Also, supplier integration involves the coordination of core competencies of firms and its critical suppliers (Bowersox et al., 1999). Supplier integration extends from unproductive arm's-length supply chain relationship to long-term contracts yet cooperative relationship through joint efforts in product development, problem solving, design support and technology exchange (Boon-itt and Wong, 2011). Apart from integrating supply side of a supply chain, demand side can be integrated as well into a synchronised process in order to fulfill customers' demand. Customer integration involves rapid responses to customer's needs and requirements related to better understanding of the customer organisation's product, market and culture (Boon-itt and Wong, 2011).

In today's turbulent global marketplace, the high levels of uncertainties in demand and technological urge the need to promote a highly integrated supply chain (Boon-itt and Wong, 2011; Mentzer et al., 2000; Ragatz et al., 2002; van der Vorst and Beulens, 2002) such as pursuing various supply chain integration practices. The previous studies have suggested that there are two points of view on the roles of demand and technological uncertainty on SCM literature. The first point focuses on a straightforward relationship between environmental uncertainty and supply chain integration (Paulraj and Chen, 2007; Ragatz et al., 2002; Xu et al., 2010; Zhou and Benton, 2007). In the second context, demand and technological uncertainties are considered as exogenous factors in which a company is facing in today supply chains (Boon-itt and Wong, 2011; Iyer et al., 2004). This study applies the perspective of second context which environmental uncertainty is considered as exogenous factor faced by a firm in external integration-firm performance relationship. When the environmental competitiveness is high, firm is capable to expand or modify its current markets, products and services in order to improve business performance (Lumpkin and Dess, 2001). In relation to this study, the main role of external integration is not meant to minimise environmental uncertainties, but to reduce the adverse effects of environmental uncertainties on firm performance. Therefore, it is said that firms that are capable of operating supply chain under competitive environment can outperform those companies that do not.

The environmental uncertainties including technological uncertainty, demand changes and competitive threats are used to explain the effect of environmental uncertainty on external integration-firm performance relationship. Thus, environmental uncertainty is the variable will be used to function as an external variable in achieving higher firm performance in this study. Uncertainty and risk are inherent in every supply chain; customer demand is rarely perfectly stable, machines and vehicles may not work well all the times as well as uncertainty of travel times. Also, a relatively new trend in industry such as offshoring, outsourcing and lean manufacturing, in which total supply

chain costs can be reduced that may cause the industry to have a substantial increase in the supply chain risk level (Simchi-Levi et al., 2007) and supply chain disruptions.

2. Conceptual Mode1

The hypothesized model linking the relationship between external integration, environmental uncertainty and firm performance is depicted in Figure 1. The proposed theoretical construct of external integration includes supplier relationship and customer relationship. Environmental uncertainty consists of demand uncertainty, technological uncertainty and competitive threats. Also, time to market, quality, delivery dependability, cost and profit, customer satisfaction and customer service responsiveness will be used to measure the firm performance. Finally, it is imperative to note that the proposed constructs are not a complete set of measurement scale due to the entire of supply chain integration practices and firm performance can not be encompassed in just a single study.

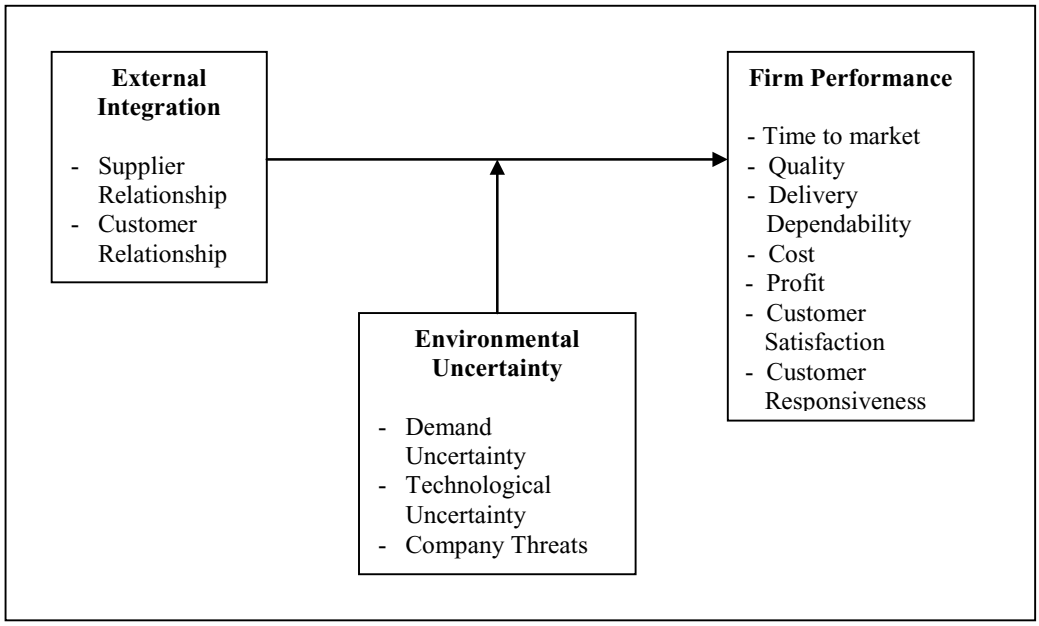

Fig. 1. Proposed conceptual model.

3. External integration

Interaction with outside organisations refers to building strategic partnerships with suppliers and developing good relationships with customers. The arc of integration (outward facing) has helped organisations to achieve higher level of business performance in terms of customer responsiveness, cost and time in a global study across industries (Frohlich and Westbrook, 2001). The integrated supply chain from a horizontal perspective has led to higher level of operational competency in terms of logistics services such as ability to offer services including vendor managed inventory and just-in-time, to make products easily available to customers and to quickly adapt the distribution network to meet demand (Halley and Beaulieu, 2009).

3.1. Supplier relationship

Relationship with supplier is development of a continuing relationship between firm and its suppliers (Li et al., 2005). Organisation interacts with suppliers to acquire raw materials and components for its manufacturing process through creating closer and more collaborative relationships. Koh et al. (2007) implied that supplier relationship involves the cooperative efforts between supplier and buyer; it also includes coordination and collaboration between

them. Lamming first recognised the successful partnerships with suppliers and found that there are potentials to create competitive advantage for the automotive industry in 1993 (Goffin et al., 1997). Such strategic partnerships involve suppliers in decision-making and internal operations of key activities such as research and development, procurement and distribution (Bagchi et al., 2005), supplier site visits, joint product design, just-in-time delivery and the use of electronic data interchange for advanced communication (Mudambi and Schrunder, 1996). By developing strategic alliances with suppliers, manufacturing firms can reduce purchased lead-time, develop multi-skilled workforce training and share information freely (Koh et al., 2007). Besides, the benefits of collaborative relationships with suppliers include joint problem-solving, new ideas stimulation, product and process improvement, design refinement, technology transfer, innovation, higher quality, less waste and lower costs (Jones, 1996).

SMEs face resources gap in terms of financial, skills, knowledge and technology (Hashim, 2007); therefore, their sustainable business success hinges more on the suppliers' capabilities and co-operative relationships (Jones, 1996; Mudambi and Schrunder, 1996; Mudambi et al., 2004; Park and Krishnan, 2001). Since the scarcity of SMEs' resources need to be complimented by external resources, the close suppliers relationships allow SMEs to access to the latest process, technologies, materials, and other methods of innovation (Koh et al., 2007; Pressey et al., 2009). As Lipparini and Sobrero (1994) pointed out, small companies often utilise supplier relationships as a means to connect external and internal expertise and capabilities, hence improving their innovation. This view is echoed by Jones (1996) who emphasised that small firms have developed more progressive supplier mindsets and leverage the capabilities of suppliers (e.g. in the production process and design) by working closely with them for mutual gain. Ellegaard (2006) similarly advocated the importance of close suppliers' relationships reporting that small companies cultivate dense relationships with suppliers can increase the stability of supply that in turn reduces supply shortage risk. In addition, Mudambi et al. (2004) discovered that the high levels of cooperative buyer-supplier relations have percolated down to few successful SMEs and managed to accelerate time-to-market. John Morrisey and Pittaway (2006) also highlighted that many SMEs have developed deep relationships with their suppliers. Through close relationships, suppliers are more willing to help in when there is unexpected high demand from customers (Fawcett et al., 2008). Also, having a closer relationship with suppliers, SMEs can obtain materials that meet specification.

3.2. Customer relationship

The nature of customer relationships has conceptualised along a continuum ranging from creating relationships (attraction), developing relationships (loyalty) to maintaining relationships (interaction) (Izquierdo et al., 2005). SMEs are likely to have a relatively small customer base or have fewer customers (Thakkar et al., 2009), therefore, customer orientation is of paramount importance to supply chain management success and may be one of the critical success factors where SMEs can take the lead in driving a successful supply chain (Meehan and Muir, 2008). In fact, most of the SMEs' demand is dominated by major customers or stronger customers (John Morrisey and Pittaway, 2006). They build closer and long-term relationships with customers; even some have developed more personal relationships with customers (Hong and Jeong, 2006). This is broadly in line with Bhutta et al.'s (2007) findings, who reported that most SMEs in Pakistan have long-term business relationship with their customers and have engaged their business with their two major customers more than 10 years. As SMEs' dependence on stronger customers is high or serve only a limited geographic market, so that their competitive priority is to generate sufficient profits to grow their business by focusing on specialised niche market, irrespective of the size of the market share (Hong and Jeong, 2006). Therefore, SMEs focus on developing their niching or focus strategy based on customer needs and wants (Lee et al., 1999).

Min and Mentzer (2004) asserted that close customer relationship is crucial for understanding and meeting customers' requirements and needs. Robb et al. (2008) highlighted that frequent communication is key to stronger customer relationships, while Chin et al. (2004) found that trustworthy and positive relationships, as well as accurate information are essential for customer relationship management. On the other hand, Chow et al. (2008) suggested that customer relationship should focus on integration and customer service management covering various activities, such as on time delivery to customers, customers feedback and customer segmentation based on service needs. Other authors, like Li et al. (2005), identified that frequent customer interaction, customer satisfaction and customer expectations evaluations are important to build long-term relationships with customers. Customer loyalty results from customer satisfaction and thus contributing to supply chain's and firm's success (Mentzer, 2001).

4. Environmental Uncertainty

Organisations frequently must cope with anomalous crises, which create high levels of uncertainty and are potential threats to the viability of an organisation. Uncertainty is a changeability of the state of the environment, failure to forecast the impact of changes in environmental, and unable to expect the outcomes of a response choice (Milliken, 1987, p. 136). Uncertainty evolves from technology, regulation and social expectations are the inevitable characteristics of the general business environment (Sharma et al., 2007). Environmental uncertainty is a complicated construct as it contains various factors from different viewpoint (Sutcliffi and Zaheer, 1998). Thus, many authors have identified environmental pressures differently and each of the influences is recognised based on variability, complexity and vulnerability (Ying, 2006). Lawrence and Lorsch (1967) accentuated that uncertainty in environmental should divide into two major aspects: technology and market. Govindarajan (1984) further suggested that uncertainty in environmental is linked to suppliers of raw material, customers demand, competitors for resources and markets, capital and labour, and finally the regulation groups including government bodies and unions. There are five categories of environmental uncertainty as proposed by Porter (1980): customers, competitors, latent competitors, suppliers and alternative products. Hoque (2004) adapted previous measurements on environmental uncertainty and suggested eight dimensions for assessing environmental uncertainty: customer demands, preferences and tastes, actions of suppliers, globalisation and deregulation, competitors' market activities, government regulation and policies, economic environment, production and information technologies, and industrial relations.

4.1. Demand Uncertainty

Uncertainty can be grouped into three different sources, namely supply uncertainty, process uncertainty and demand uncertainty (Davis, 1993). Among them, demand uncertainty is the most common and severe type of uncertainty (Davis, 1993; McCutcheon et al., 1994). Therefore, demand uncertainty has been chosen for this study. Customer demands have become increasingly difficult to predict in terms of timing and place, volume and product mix (Tachizawa and Thomsen, 2007). In addition, heterogeneity in customer demands also derives from a variety of customisation such as delivery lead-time, technology changes and different pricing rates (Ying, 2006).

The traditional operations management literature provides ample evidence that higher demand uncertainty leads to higher supply chain costs due to the increasing mismatch between demand and supply (Cachon and Terwiesch 2004; Ramdas 2003). Demand order variability in the supply chain is called as "bullwhip effect" or external vulnerability as described by Prater et al. (2001). Supply chain needs to be flexible in the areas of sourcing, manufacturing, delivery and balancing trade-off in business operation. In support, Kumar et al. (2006) proposed that supply chain management at implementation phase should have capability of sourcing, product, new product and delivery in order to deal with unpredictable demand under control mechanism. In addition, Goyal (2005) found that demand uncertainty for individual products can be mitigated through product flexibility, which in turn better manage uncertainty in aggregate demand. Lead time reduction is another option to enable a company to react more quickly to demand information and, hence, to better match supply with uncertain demand (Fisher et al., 2009). As such, for organisations to react to unpredictable demand, a viable option for them is to have agile, adaptive and aligned operational strategies (Reichhart and Holweg, 2007). Thereby, organisations need to redefine their operations strategies, align buyer-suppliers expectations on quality, pricing and delivery lead-times, as well as reconfigure the organisational resources to achieve organisational performance.

4.2. Technological Uncertainty

Technological uncertainty means "a lack of common knowledge and agreement about what production technology will be relevant in the future" (Meyer, 2008). Uncertainty in technological changes may due to the adoption and diffusion of new technologies, competitors' strategic actions and market and customer acceptance (Rosenberg, 1996). Numerous opportunities are being evolved for the development of new technology such as technological innovation can create a new market for the new offering products (Berman and Hagan, 2006; Boon-itt and Wong, 2011; Mohr et al., 2010). In addition, the multidisciplinary and dynamic technology can be initiatives to restructure supply chain when organisations depend on other organisations to gain compulsory technological know-

how for competition (Boon-itt and Wong, 2011; Hagedoorn, 1993). Besides, Information technology (IT) has caused the geographic barriers less relevant. IT is the lubrication that enables supply chain management to work smoothly (Tracey et al., 2004) for providing information availability and visibility in supply chain (Altekar, 2005); IT helps synchronise value activities, create relationships and interrelationships that strengthen the supply chain (Sheffi, 1990). IT is vital for managing a control in global supply chain. IT helps (1) gather information on each product status from production to customer delivery or purchase point and provide a clear visibility for all supply chain parties, (2) access data in the system from a single point of contact, (3) analyse, plan activities and make tradeoffs based on information from the entire supply chain and (4) alliance with supply chain partners (Simchi-Levi et al., 2004). Most importantly, IT is a means for transaction costs reduction which relates to the goods flows control (Boon-itt and Wong, 2011).

According to Shenhar and Dvir (1996), technological uncertainty has been classified into four levels: type A (low-tech projects using existing and well-established technologies); type B (medium-tech projects using existing but with some new technology); type C (high-tech projects using mostly new and existing technology); and type D (super high-tech projects using new technologies that do not exist during project initiation). When technological uncertainty is high, the prediction of emergence of specific new product and process technologies will be much difficult (Kor et al., 2008). Therefore, the growing levels of technology uncertainty prompts more and more companies to collaborate with each others on new product development; Steensma and Corley (2000) suggested technology-sourcing partnerships; Khalid (2002) proposed a framework on buyer and supplier relationship dynamics based on technological capability of suppliers and how firms rely on each others for different technologies. Firms stay responsive amid technological uncertainties will be able to trigger a learning process which is linked to superior supply chain performance level (Asree and Rao, 2011). This means a highly integrated firm will be able to share information and align its business goals in order to reduce the negative effects of technological uncertainty on firm's performance.

4.3. Competitive Threats

Competitive threats refer to the extent of changes in supply chain practices resulted from market competition (Quah, 2010). The classical competitiveness literature emphasised cost and product differentiation can put firms in strategic positions in the marketplace (Porter, 1990). For example, Wal-Mart had used a low-cost/differentiation strategy to achieve competitive advantage compared to many retailers (Parnell and Lester, 2008). However, cost and product differentiation are not the only primary competition factors for firms to distinguish themselves. Indeed, there are other strategic initiatives such as quality, flexibility (volume and product mix), delivery speed, delivery reliability (Olhager, 2003; Zailani and Rajagopal, 2005), product design/ innovation, after-market service and image can help firms or order winners to compete with their competitors. Besides, competitive threats such as customisation and built-to-order mechanism are making Dell to distinguish itself from its competitors successfully (Holweg and Pil, 2001). On the other hand, when a disruptive technology that initially serve isolated market niche becomes mature, the industry boundaries can be altered by displaying different levels of competitive threats and disruption effects such as prices, market shares, social welfare and innovation incentives (Adner and Zemsky, 2004). Furthermore, the growing threats of competition can be amplified as market becomes more globally connected, trade barriers are removed, intellectual properties rights are granted for a limited period of time, more advanced IT, and many organisations may be suppliers and competitors at the same time with the trendy outsourcing activities (Porter, 1990).

The supply chain can be a powerful strategy for enhancing organisational competitiveness (Ayers, 1999; Gunasekaran et al., 2008). Supply chain integration is powerful in differentiating firm performance when competitiveness of an industry is high. Under a volatile environment, firms emphasised on an agile supply chain strategy (Qi et al., 2011). In such circumstances, this suggests that firms vary in the extent to which their adoption decisions concerning supply chain integration have been motivated by institutional pressures to mimic successful peers and powerful others. Ward et al. (1995) found that manufacturers in Singapore show positive response to these pressures and coalesced cost, quality and flexibility to deliver superior performances through competitive priorities alignment. Reichhart and Holweg (2007) created a customer-responsive supply chain strategy to deal with environmental turbulence. SMEs face different levels of competitive threats such as high rate of new entrants,

introduction of substitute products, significant bargaining power for buyers, limited access of modern technology and finance (Southiseng and Walsh, 2010). Therefore, operation systems need to be re-engineered and supply chain relationships need to be tightened in order to provide competitive quality, cost structure and delivery commits (Duclos et al., 2003; Kumar et al., 2006; Lummus et al., 2003).

5. Firm Performance

A performance metric is important to understand whether the process performance is improving or worsening and whether correction action is needed urgently (Roussel and Cohen, 2005). Firm performance is an indicator to measure how well market orientation and financial goals are fulfilled by an organisation (Li and Lin, 2006). Different researchers have attempted to assess firm performance in different ways, but most performance metrics up to now are the combination of operational and financial dimensions. According to Venkatraman and Ramanujam (1986), financial dimensions should include profit, return on investment, growth of sales, business effectiveness and performance. Min and Mentzer (2004) measured business performance in terms of availability, variety of product/service offering, timeliness, profitability and growth. Tracey et al. (2005) used perceived product value, customer loyalty, market performance and financial performance to measure business performance. Li et al. (2006) applied market share, return on investment, the growth of market share and sales, growth in return on investment, profit margin on sales and overall competitive position to measure organisational performance. Cook et al. (2011) combined operational and financial dimensions to define the construct of firm performance. Drawing on existing literature, this study will use time to market, quality, delivery dependability, cost and profit, customer satisfaction and customer service responsiveness to measure firm performance.

6. Conclusion

This paper extensively reviews the literature in the field of supply chain integration and highlights that supplier and customer integration can reduce the adverse effects of environmental uncertainties on firm performance. Supplier and customer integration are proposed to be the ideal interfirm relationship for a higher level of cooperation and are more likely to succeed between firms in order to pursue competitive achievement such as parity and advantage competitive. Previous study found that technological and demand uncertainties moderated the relationships between supplier integration and customer delivery performance (Boon-itt and Wong, 2011). However, other environment uncertainties such as competitive threats and other business performance metrics are left to future research to uncover. In view of scant research efforts have attempted to investigate the moderating effect of environment uncertainty (demand uncertainty, technological uncertainty and competitive threats) on the relationship between external integration (supplier-customer integration) and firm performance in manufacturing industry of SMEs, this paper intends to fill the research gap. The research presented in this paper has implications for both academicians and practitioners with an interest in considering and knowing how external integration might impact upon firm performance under different situations of environmental uncertainty. Ultimately, such thought depends upon more detailed empirical research in Malaysian SMEs.

References

Adner, R., & Zemsky, P. (2004). Disruptive technologies and the emergence of competition. *Rand Journal of Economics, 36(2), 229-254.*

Altekar, R. V. (2005). *Supply chain management: Concepts and cases*. New Delhi: Prentice Hall of India.

Asree, S., & Rao, B. (2011). The responsive supply chain performance: Relationships with technology uncertainty and organisational learning. *International Journal of Integrated Supply Management*, 6(2), 127-139.

Ayers, J. (1999). Supply chain strategies. *Information Systems Management.* 16(2): 72-79.

Bagchi, P. K., Ha, B. C., Skjoett-Larsen, T., & Soerensen, L. B. (2005). Supply chain integration: A European survey. *International Journal of Logistics Management*, 16(2), 275-294.

Berman, S. J., & Hagan, J. (2006). How technology-driven business strategy can spur innovation and growth. *Strategy and Leadership*, 34(2), 28-34.

Bhutta, M. K. S., Rana, A. I., & Asad, U. (2007). SCM practices and the health of the SMEs in Pakistan. *Supply Chain Management: An International Journal*, 12(6), 412-422.

Boon-itt, S., & Pongpanarat, C. (2011). Measuring service supply chain management processes: The application of the Q-sort technique. *International Journal of Innovation, Management and Technology*, 2(3), 217-221.

Bowersox, D., Closs, D. J., & Stank, T. P. (1999). *21st century logistics: Making supply Chain integration a reality*. Oak Brook, IL: Council of

Logistics Management.
Cachon, G. P., & Terwiesch, C. (2004). *Matching supply with demand: An introduction to operations management*. New York: McGraw-Hill.
Chin, K-S., Rao Tumala, V. M., Leung, J. P. F., & Tang, X. (2004). A study on supply chain management: The Hong Kong manufacturing perspectives. *International Journal of Physical Distribution & Logistics Management*, 30(6), 505-524.
Chow, W. S., Madu, C. N., Kuei, C-H., Lu, M. H., Lin, C., & Tseng, H. (2008). Supply chain management in the US and Taiwan: An empirical study. *The International Journal of Management Science*, 36, 665-679.
Cook, L. S., Heiser, D. R., & Sengupta, K. (2011). The Moderating effect of supply chain role on the relationship between supply chain practices and performance: An empirical analysis. *International Journal of Physical Distribution & Logistics Management,* 41(2), 104-134.
Davis, T. (1993). Effective supply chain management. *Sloan Management Review*, 34(4), 35-46.
Duclos, L. K., Vokurka, R. J., and Lummus, R. R. (2003). A conceptual model of supply chain flexibility. *Industrial Management and Data Systems*, 103(6), 446-456.
Ellegaard, C. (2006). Small company purchasing: A research agenda. *Journal of Purchasing & Supply Management*, 12, 272-283.
Fawcett, S. E., & Magnan, G. M. (2002). The rhetoric and reality of supply chain integration. *International Journal of Physical Distribution & Logistics Management,* 32(5), 339-361.
Fawcett, S. E., Magnan, G. M., & Mccarter, M. W. (2008). Benefits, barriers, and bridges to effective supply chain management. *Supply Chain Management: An International Journal*, 13(1), 35-48.
Fisher, M., Hammond, J., Obermeyer, W., & Raman, A. (2009). Configuring a supply chain to reduce the cost of demand uncertainty. *Production and Operations Management*, 6(3), 211-225.
Frohlich, M. T., & Westbrook, R. (2001). Arc of integration: An international study of supply chain strategies. *Journal of Operations Management,* 19, 185-200.
Goffin, K., Szwejczewski, M., & New, C. (1997). Managing suppliers: When fewer can mean more. *International Journal of Physical Distribution & Logistics Management*, 27(7), 422-436.
Govindarajan, V. (1984). Appropriateness of accounting data in performance evaluation: An empirical examination of environmental uncertainty as an intervening variable. *Accounting, Organizations and Society*, 9(2), 125-135.
Goyal, M. (2005). *Managing operational flexibility under demand uncertainty*. Unpublished Dissertation, University of Pennsylvania.
Gunasekaran, A., Lai, K. H., & Cheng, E. T. C. (2008). Responsive supply chain: A competitive strategy in a networked economy. *The International Journal of Management Science,* 36(4), 549-564.
Hagedoorn, J. (1993). Understanding the rationale of strategic technology partnering: Inter organizational modes of cooperation and sectoral differences. *Strategic Management Journal*, 14, 371-385.
Halley, A., & Beaulieu, M. (2009). Mastery of operational competencies in the context of supply chain management. *Supply Chain Management: An International Journal*, 14(1), 49-63.
Hashim, M. K. (2007). *SMEs in Malaysia: A brief handbook*. Malaysia: August Publishing Sdn. Bhd.
Holweg, M., & Pil, F. K. (2001). Successful build to order strategies: Start with the customer. *MIT Sloan Management Review*, 74-83.
Hong, P., & Jeong, J. (2006). Supply chain management practices of SMEs: From a business growth perspective. *Journal of Enterprise Information Management*, 19(3), 292-302.
Hoque, Z. (2004). A contingency model of the association between strategy, environmental uncertainty and performance measurement: Impact on organizational performance. *International Business Review*, 13*(*4), 485-502.
Iyer, K. N. S., Germain, R., & Frankwick, G. L. (2004). Supply chain B2B e-commerce and time-based delivery performance. *International Journal of Physical Distribution & Logistics Management*, 34(7/8), 645-661.
Izquierdo, C. C., Cillan, J. G., & Gutierrez, S. S. M. (2005). The impact of customer relationship marketing on the firm performance: A Spanish case. *Journal of Services Marketing*, 19(4), 234-244.
John Morrissey, W., & Pittaway, L. (2006). Buyer-supplier relationships in small firms: The use of social factors to manage relationships. *International Small Business Journal*, 24(3), 272-298.
Jones, R. (1996). Small-firm success and supplier relations in the Australian boat-building industry: A contrast of two regions. *Journal of Small Business Management*, 34(2), 71-78.
Khalid, S. (2002). *Innovation through networks: Technology and cooperative relationships*. The 18th IMP-Conference, 5-7 September 2002, Dijon: France.
Koh, S. C. L., Demirbag, M., Bayraktar, E., Tatoglu, E., & Zaim, S. (2007). The impact of supply chain management practices on performance of SMEs. *Industrial Management & Data Systems,* 107(1), 103-124.
Kor, Y. Y., Mahoney, J. T., & Watson, S. (2008). The effects of demand, competitive, and technological uncertainty on board monitoring and institutional ownership of IPO firms. *Journal of Management and Governance*, 12(3), 239-259.
Kumar, A., Fantazy, K. A., & Kumar, U. (2006). Implementation and management framework for supply chain flexibility. *Journal of Enterprise Information,* 19(3), 303-319.
Lawrence, P. R., & Lorsch, J. (1967). *Organization and environment*. Boston, Ma: Harvard Business School Press.
Lee, H. (2000). Creating value chain through supply chain integration. *Supply Chain Management Review*, September/October: 30-37.
Lee, K. S., Lim, G. H., & Tan, S. J. (1999). Dealing with resource disadvantage: Generic strategies for SMEs. *Small Business Economics*, 12, 299-311.
Li, S., & Lin, B. (2006). Accessing information sharing and information quality in supply chain management. *Decision Support Systems*, 42, 1641-1656.
Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The impact of supply chain management practices on competitive advantage and organisational performance. *The International Journal of Management Science*, Omega 34, 107-124.
Li, S., Subba Rao, S., Ragu-Nathan, T. S., & Ragu-Nathan, B. (2005). Development and validation of a measurement instrument for studying supply chain management practices. *Journal of Operations Management*, 23, 618-641.
Lipparini, A., & Sobrero, M. (1994). The glue and the pieces: Entrepreneurship and innovation in small-firm networks. *Journal of Business Venturing*, 9(2), 125-140.
Lummus, R. R., Duclos, L. K., & Vokurka, R. J. (2003). Supply chain flexibility: Building a new model. *Global Journal of Flexible Systems*

Management, 4(4), 1-13.
Lumpkin, G. T., & Dess, G. G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing*, 16(5), 429-51.
Mccutcheon, D. M., Raturi, A. S., & Meredith, J. R. (1994). The customization-responsiveness squeeze. *Sloan Management Review*, 35(2), 89-99.
Meehan, J., & Muir, L. (2008). SCM in Merseyside SMEs: Benefits and barriers. *The TQM Journal,* 20(3), 223-232.
Mentzer, J. T. (2001). *Supply chain management*. United States of America: Sage Publications, Inc.
Mentzer, J. T., Min, S., & Zacharia, Z. G. (2000). The nature of interfirm partnering in supply chain management. *Journal of Retailing*, 76(4), 549-568.
Meyer, P. B. (2008). *New technologies and earnings variation within occupations since 1960*. Office of Productivity and Technology, U.S. Bureau of Labor Statistics.
Milliken, F. J. (1987). Three types of perceived uncertainty about the environment: State, effect, and response uncertainty. *Academy of Management Review*, 12(1), 133-143.
Min, S., & Mentzer, J. T. (2004). Developing and measuring supply chain concepts. *Journal of Business Logistics*, 25(1), 63-99.
Mohr, J., Sengupta, S., & Slater, S. (2010). *Marketing of high-technology products and innovations* (3rd ed.). Upper Saddle River, New Jersey: Pearson Education, Inc.
Mudambi, R., & Schrunder, C. P. (1996). Progress towards buyer-supplier partnerships: Evidence from small and medium-sized manufacturing firms. *European Journal of Purchasing & Supply Management*, 2(2/3), 119-127.
Mudambi, R., Schrunder, C. P., & Mongar, A. (2004). How co-operative is co-operative purchasing in smaller firms? Evidence from UK engineering SMEs. *Long Range Planning*, 37, 85-102.
Olhager, J. (2003). Strategic positioning of the order penetration point. *International Journal of Production Economics*, 85, 319-329.
Park, D., & Krishnan, H. A. (2001). Supplier selection practices among small firms in the United States: Testing three models. *Journal of Small Business Management*, 39(3), 259-271.
Parnell, J. A., & Lester, D. L. (2008). Competitive strategy and the Wal-Mart threat: Positioning for survival and success. *SAM Advanced Management Journal*, 73(2), 14-24.
Paulraj, A., & Chen, I. J. (2007). Environmental uncertainty and strategic supply management: A resource dependence perspective and performance implications. *Journal of Supply Chain Management*, 43(3), 29-42.
Peng, M. W. (2009). *Global business*. Canada: South-Western Cengage Learning.
Porter, M. E. (1980). *Competitive strategy: Techniques for analyzing industries and competitors*. New York: The Free Press.
Porter, M. E. (1990). The competitive advantage of nation. *Harvard Business Review,* 68(2), 73-93.
Prater, E., Biehl, M., & Smith, M. A. (2001). International supply chain agility: Tradeoffs between flexibility and uncertainty. *International Journal of Operations & Production Management*, 21(5/6), 823-839.
Pressey, A. D., Winklhofer, H. M., & Tzokas, N. X. (2009). Purchasing practice in small- to medium-sized enterprises: An examination of strategic purchasing adoption, supplier evaluation and supplier capabilities. *Journal of Purchasing & Supply Management*, 15, 214-226.
Qi, Y., Zhao, X., & Sheu, C. (2011). The impact of competitive strategy and supply chain strategy on business performance: The role of environmental uncertainty. *Decision Sciences*, 42, 371–389.
Quah, H. S. (2010). *Relationship of value chain flexibility and supply chain capability towards supply chain performance*. Unpublished PhD Dissertation, Universiti Utara Malaysia.
Ragatz, G. L., Handfield, R. B., & Peterson, K. J. (2002). Benefits associated with supplier integration into new product development under conditions of technology uncertainty. *Journal of Business Research*, 55, 389-400.
Ramdas, K. (2003). Managing product variety: An integrative review and research directions. *Production Operations Management*, 12, 79-101.
Reichhart, A., & Holweg, M. (2007). Creating the customer-responsive supply chain: A reconciliation of concepts. *International Journal of Operations & Production Management*. 27(11), 1144-1172.
Robb, D. J., Xie, B., & Arthanari, T. (2008). Supply chain and operations practice and performance in Chinese furniture manufacturing. *International Journal of Production Economics*, 112, 683-699.
Rosenberg, N. (1996). Uncertainty and technological change. In R. Landau, R. Taylor, & G. Wright (Eds.), *The mosaic of economic growth*. Stanford University Press, Stanford, CA.
Roussel, J., & Cohen, S. (2005). *Strategic supply chain management: The 5 disciplines for top performance*. United States of America: The McGraw-Hill Companies.
Sharma, S., Aragon-Correa, J. A., & Rueda-Manzanares, A. (2007). The contingent influence of organizational capabilities on proactive environmental strategy in the service sector: An analysis of North American and European ski resorts. *Canadian Journal of Administrative Sciences*, 24(4), 268-283.
Sheffi, Y. (1990). Third party logistics: Present and future prospects. *Journal of Business Logistics*, 11(2), 27-39.
Shenhar, A. J., & Dvir, D. (1996). Toward a typological theory of project management. *Research Policy*, 25, 607-632.
Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2004). *Managing the supply chain: The definitive guide for the business professional*. United States of America: McGraw-Hill.
Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2007). *Designing and managing the supply chain: Concepts, strategies and case studies* (3rd ed.). United States of America: McGraw-Hill.
SME Annual Report (2009/10). Transformation to the new economic model. *SME Corporation Malaysia*. Retrieved January 30, 2011, from http://www.smeinfo.com.my/index.php?option=com_content&view=article&id=1216&itemid=1181&lang=en
SME Annual Report (2011/12). Redefining the future. *SME Corporation Malaysia*. Retrieved February 1, 2013, from http://www.smecorp.gov.my/vn2/node/177
Southiseng, N., & Walsh, J. (2010). Competition and management issues of SME entrepreneurs in Laos: Evidence from empirical studies in Vientiane Municipality, Savannakhet and Luang Prabang. *Asian Journal of Business Management*, 2(3), 57-72.
Stank, T. P., Keller, S. B., & Closs, D. J. (2001). Performance benefits of supply chain logistical integration. *Transportation Journal*, 41(2/3), 32-46.

Steensma, H. K., & Corley, K. G. (2000). On the performance of technology-sourcing partnerships: The interaction between partner interdependence and technology attributes. *Academy of Management Journal*, 43(6), 1045-1057.

Stevens, G.S. (1989). Integrating the supply chain. *International Journal of Physical Distribution and Material Management*, 19(8), 3-8.

Sutcliffe, K. M., & Zaheer, A. (1998). Uncertainty in the transaction environment: An empirical test. *Strategic Management Journal*, 19, 1-23.

Tachizawa, E. M., & Thomsen, C. G. (2007). Drivers and sources of supply flexibility: An exploratory study. *International Journal of Operations & Production Management*, 27(10), 1115-1136.

Thakkar, J., Kanda, A., & Deshmukh, S. G. (2009). Supply chain management for SMEs: A research introduction. *Management Research News*, 32(10), 970-993.

Tracey, M., Fite, R. W., & Sutton, M. J. (2004). An explanatory model and measurement instrument: A guide to supply chain management research and applications. *American Journal of Business*, 19(2), 53-69.

Tracey, T., Lim, J-S., & Vonderembse, M. A. (2005). The impact of supply-chain management capabilities on business performance. *Supply Chain Management: An International Journal*, 10/3, 179-191.

Van Der Vorst, J., & Beulens, A. J. M. (2002). Indentifying sources of uncertainty to generate supply chain redesign strategies. *International Journal of Physical Distribution & Logistics Management*, 32(6), 409-430.

Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review*, 11, 801-814.

Ward, P. T., Duray, R., Leong, G. K., & Sum, C. (1995). Business Environment, Operation Strategy and Performance: An Empirical Study of Singapore Manufacturers. *Journal of Operations Management*, 13(2), 99-115.

Xu, D., Zhao, L., Li, G., & Sun, L. (2010). *The effect of environmental uncertainty on supply chain integration on Chinese manufacturing industry*, 7th International Conference on Service Systems and Service Management, 28-30 June 2010, Tokyo, Japan: 1-5.

Ying, L. (2006). *Supply chain flexibility: Antecedents, driving force impacts on performance*. Unpublished PhD Dissertation, University of Toledo.

Zailani, S., & Rajagopal, P. (2005). Supply chain integration and performance: US versus East Asian companies. Supply Chain Management: An International Journal, 10/5, 379-393.

Zhou, H., & Benton, Jr., W. C. (2007). Supply chain practices and information sharing. *Journal of Operations Management*, 25, 1348-1365.