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Enhancing Supply Chain Ambidexterity by Adapting Resiliency

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Abstract This research investigates the influences of supply chain resilience strategies on supply chain ambidexterity as a dynamic capability. The ability to excel simultaneously on competitive capabilities of small medium enterprises (SME's) and in, turn on their business performance. Supply chain resililence is conceptualized as a simultaneous pursuit of both explorative and exploitative supply chain. Applied two main theoretical frames from the literature (dynamic capabilities and organizational ambidexterity) to SCM to examine mitigation strategies after SC disruption. "Ambidexterity as a dynamic capability" indicates that dynamic capability is fundamentally associated with a combination of exploitation and exploration. Found that a key element of achieving ambidexterity is the strategic integration and configuration ability to utilize existing competencies and develop new ones. Moreover, successful SC ambidexterity allows firms to have the resiliency to mitigate enterprise risks. Thus, this research seeks to investigate how firms' SC ambidexterity is developed through a dynamic capability-building process and how this, in turn, can mitigate the negative impact of SC disruptions and improve business performance, study offers a practical implementation of Supply chain ambidexterity framework in the supply management, increases focal points on improves the sustainability of operational performance of the Small Medium Enterprise's (Manufacturing sector) overall supply chain. Optimistically, in the end, this study seeks to enhance the operational sustainability in SMEs manufacturing sector.

Keywords Supply Chain Resilience, Supply Chain Ambidexterity

1. Introduction

Business environment has defined as a highly competitive and has become increasingly complex and dynamic recently. Competitors give more attention to rough each other up, blitz each other with new products introduction, undercut each other's prices, gang up on each other via alliances or merges and hammer away at each other's stock price. Ability to minimise the damage, recover fast from business uncertainties and quickly get back to business direction with new strategies, business models and products are widely acknowledged to build and maintain a competitive advantage (Elahi, 2013). As of late, a number of researchers have given more propriety on exploring the impact of Supply Chain Management (SCM) on firm sustainability (Paulraj, 2011; Reuter, Kai, Evi & Constantain, 2010). SCM is crucial for increasing organisations' effectiveness as well as for enhancing competitive edge, customer service and profitability. With supply chain crossing several countries and continents, transporting a multi-diversity of materials, from raw materials to final product, events that create interruption of material flow, even happen in remote place, can create large –scale disruptions. Due to a continually changing business landscape, firms need to continually develop and adapt to survive (Matthews, Tan, & Marzec, 2015). As such firms face risk of disturbance from the uncertainties along the supply chain. For example, Japanese earthquake in March, 2011, subsequently tsunami disaster caused significant losses of both people and property; the disaster also negatively affected global supply chain badly. Japanese companies, which account for the production of about 40 percent of the world's technology components, endured rolling blackouts to manage electric components supply. As results, many firms worldwide had to adjust to supply shortages from Japan (Reuters, 2011; Lee and Rha, 2014). This disaster forced the global manufacturer to delay the completion and launch of their products. "The ability of a system to return to its original state or move to a new, more desirable state after being disturbed" (Christopher and Peck, 2004), as known as state of "resilient" has emerged an essential topic within domain of SCM and Risk Management today. Innovativeness in management process as an imperative for minimizing risk related organisation growth has become focus on both management scholars and practitioners. By adapting innovativeness in management

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process, organisations can adapt to environment change and mitigate the negative impacts of threats and risks effectively (O'Reilly and Tushman, 2007; Teece, Pisano, & Shuen, 1997).

Innovation, organizational learning and performance improvement are the key theoretical perspective of ambidexterity has emerged in the field of SCM (Lee and Rha, 2016). Organizations and business units need to be ambidextrous (balance exploitation and exploration) to preserve short-term and long term efficiency and performance goal (Grant, 1996). To adapt ambidexterity over the long term, an organization should acquire dynamic capability (Janses, Tempelaar, Van Den Bosch, & Volberada, 2009; Kristal, Huang, & Roth, 2010; Kriz, Voola, & Yuksel, 2014; O'Reilly and Tushman, 2007). Resiliency perceived as a dynamic capability to achieve ambidexterity in an organization. Ambidexterity based on dynamic capability-building process improves competencies and helps firms address uncertain and unexpected environments. Thus, resiliency as a dynamic capability can make supply chain more ambidextrous for effectively dealing with the negative impact of supply chain disruption.

Pragmatically, the association between SC resiliency and SC ambidexterity as a dynamic capability, which reduce the negative impact in SC instability, has yet to be comprehensively explicated. Basically, the SC instability occurs at random (Dejonckheere, Disney, Lambrecht, & Towill, (2003), firms should enhance their resiliency and capabilities to quickly and effectively address SC-disruptive events (Christopher and Peck, 2004; Macdonald and Corsi, 2013; Pettit, Croxton, & Fiksel, 2013; Revilla and Saenz, 2014). Thus, building a resilience SC can play a critical role in SC risk management (Christoper, 2004; Christopher and Peck, 2004; Macdonald and Corsi, 2013; Sheffi, 2005a; Tang, 2006). The purpose of this study is to empirically investigate how SME's SC ambidexterity is developed through SC resilience as a dynamic capability-building processes and how this, in turn, can mitigate the negative impact of SC disruptions and improve business performance.

2. Literature

2.1. Dynamic Supply Chain Capability

Dynamic capabilities Theory (DCT) is an advancement of resource-based view (RBV) (Ponomarov and Holcomb, 2010) with a specific focus on value creation activities, as opposed to value appropriation/capture focus of current mainstream RBV. The RBV of the firm provides important insights for understanding how competitive advantage within firms is created and how such advantage is sustained over time. The RBV states that organisations obtain competitiveness advantages by accumulating internal resources and capabilities that are rare, valuable and difficult to imitate (Barney, 1991). Thus, one of the main objectives for firms applying a RBV is to identify their capabilities and develop them further (Day, 1994). Owing to their dynamics and complexity, however, capabilities are often difficult to identify. In addition, capabilities often span over several functional areas, which makes it even more challenging. While some capabilities can be identified using the standard functional approach, the most important capabilities often arise from integration of individual functional capability. Thus, integration and coordination of resources are they key characteristics of capability.

Teece et al., (1997), developed the RBV approach one step further by formulating the dynamic capabilities perspective. The term "dynamic" refers to the capacity to renew competences so as to achieve congruence with the changing environment. The capabilities reflect the major role of strategic management in adapting, integrating and reconfiguring resources, organisational skills and functional competencies to respond to the challenges of the external environment. Capabilities or distinctive competencies consist of those attributes, abilities, organizational processes, knowledge, and skills that allow a firm to achieve superior performance and sustained competitive advantage over competitors. Dynamic capabilities are defined as the firm's potential to systematically solve problem, formed by its propensity to sense opportunities and threats, to make timely and market-oriented decisions, and to change its resource base (Barreto, 2010).

Furthermore, resilience is proposed to be a multi-faceted dynamic capability (Eltantawy, 2016). In other words, resilience acts as the dynamic capability by which firms integrate, build and reconfigure internal and external competencies that can sustain firm performance. Scholars organize these capabilities hierarchically, first routine-based capabilities (e.g. production, processes, purchasing and marketing), which represent the foundation of a firm's activity and pave the way for deliberate learning inside firms (Becker, Lazaric, Nelson,& Winter, 2005). Second, first-order dynamic capabilities (e.g. R&D, reengineering and innovation processes), which provide knowledge to adapt and change routine-based capabilities as the changing environment necessitates (Zollo and Winter, 2002). Third, second or higher-order multifaceted dynamic capabilities, which govern the adaptation and changes of first-order dynamic capabilities in an organisation or organizational unit (Winter, 2003; Wang and Ahmed, 2007). These higher-order multifaceted dynamic capabilities address the resource allocation conflicts on the level of first-order dynamic capabilities. Interestingly, such conflicts typically arise because first-order dynamic capabilities involve change routines with intensity and direction of an antagonistic nature, as some of them pursue an exploration approach, while others follow exploitation logic (Wang and Ahmed, 2007). This notion of "addressing resource allocation conflicts" corresponds with this study's research questions and propels the theoretical conceptualization of resilience in this study as a higher-order dynamic capability that captures two contrasting aspects of stability; one that focuses on

efficiency and constancy (exploitation) and another that focuses on change and unpredictability (exploration).

2.2. Supply Chain Resilience

The concept of resilience extensively appears in engineering, ecological and organisational perspective (Cash et al., 2013; Gunderson and Holling, 2002; Martin and Peck, 2004). The term of resilience developed in the field of ecology (Holling, 1973), but has a wider influence and well established the mid of 1990s onwards, has been applied in multi-disciplinary contexts to study the integrations in socio-economic systems (Limnions, Mamouni, Mazzarol, Ghadouani, & Schilizzi, 2014). Meanwhile, early work in engineering on robustness, which translates into being able to return to a stable state after disruption (Pimm, 1984), influenced a great deal of work in conceptualizing resilience in supply chain and operations literature (Zsidisin and Wagner, 2010).

Academic and practitioner interest in resilience was largely driven by escalating business vulnerabilities; both external, as such legislative and environmental vulnerabilities and internal such as financial and internal business-process vulnerabilities (Mann, Kumar, Kumar, & Mann, 2010). Supply chain and operations management literature initially focused on key principles of resilience by identifying vulnerability characteristics and management responses (Martin and Peck, 2004; Sheffi, 2005). Nonetheless, the resilience term remains ambiguous and elusive in the supply chain and operations management literature (Wieland and Marcus, 2013).

There are two main observation emerge within the current conceptualizations of resilience in the literature. First, there is a lack of consensus on the nature of the dimensions that represent residence and on their respective relationship to resilience as a higher-order construct. For instance, some studies use robustness as a direct dimension of resilience (Wieland and Marcus, 2013), while others use it as an indirect determinant of resilience, i.e. using robustness as a dimension of flexibility, which in turn is a direct dimension of resilience (Zsidisin and Wagner, 2010). Others criticize the use of robustness altogether as a dimension of resilience because, although a robust process may be desirable, it does not itself equate to a resilient supply chain (Martin and Peck, 2004). This lack of concurrence on the conceptualization and dimensionality of resilience in supply chain and operations management literature suggests a need to delineating the construct in the context of supply chain phenomenon.

Second, the concept of resilience is conflated with its precursors. As such, some studies describe and operationalize resilience by the strategies (Wieland and Wallenburg, 2013), or the practices (Zsidisin and Wagner, 2010) used to achieve resilience. Despite the importance of exploring the means to achieving organizational resilience, the construct in itself needs to be clarified and explored distinctly from its precursors to allow verification of valid frameworks that accurately represent the resilience phenomenon.

2.3. Supply Chain Ambidexterity

The term “ambidexterity” to represent dual organisational systems for aligns of current certainties and the other for adaptation to new possibilities (Duncan, 1976). Ambidexterity in an organisations are able to exploit existing competences and explore new opportunities with equal dexterity (Lubatkin, Simsek, Ling, & Veiga, 2006). The ambidexterity is the ability involves simultaneously utilizing exploitation and exploration. Exploitation focuses on utilizing resources and current competitive advantage, while exploration is aimed at searching for new resources and expanding markets. Whereby exploitation includes refinement, choice, production, efficiency, selection implementation, and execution, whereas exploration usually includes search, variation, risk taking, experimentation, play, flexibility, discovery and innovation (March, 1991).

In recent studies ambidexterity acknowledged in supply chain and operations management literature (Eltantawy, 2016). There are three approaches in conceptualizing and defining ambidexterity (Simsek 2009). The first approach refers to structural ambidexterity, refers to firm’s design containing separate structural units for exploration and exploitation, for instance upstream units are responsible for exploitation (purchasing) and downstream responsible for exploitation (Marketing and Sales) (Benner and Tushman, 2003; Najafi, Sharifi, & Ismail, 2014). This suggests that cycling between periods of exploration and exploitation is more viable than simultaneously pursuing both (Duncan, 1976).

The second approach refers to contextual ambidexterity which suggests that the ambidexterity arises from features of unit or organizational context (Gibson and Birkinshaw, 2004). This approach promotes the understanding of the practices required to enable effective trade-off of an entire organisation rather than a separate units or functions responsible for new business development. According Eltantawy (2016), stated this approach may seem more applicable and sustainable compared to the structured or temporal separation models discussed above.

Third, views ambidexterity as a higher-order construct that manifests itself in the organisation’s or business unit’s exploitative and explorative attainments (March, 1991). This approach suggests that exploitative and explorative attainments comprise ambidexterity itself, as compared to structural and contextual ambidexterity, that merely refer to methods, practice and processes used to attain that ambidexterity (Eltantawy, 2016). Supply chain and operation management literature has recently espoused this approach (Narasimhan and Narayanan, 2013), suggesting that ambidexterity is determined by the organisation’s or business unit’s capacity to simultaneously demonstrate exploitation and exploration.

2.4. Hypotheses Development

Based on the approaches in conceptualizing and defining ambidexterity, based on the structural ambidexterity approach, contextual ambidexterity approach and higher-order approach the following hypothesises developed referring to the discussion in literature review based on the linkages between SC resilience and SC ambidexterity.

According to Hohenstein, Feisal, Hartmann, & Giunipero, (2015) were identified the key elements of Supply chain resilience as such Inventory management (Blackhurst, Dunn, & Craighead, 2011), Visibility (Christopher and Peck, 2004; Craighead, Blackhurst, Rungtusanatham, & Handfield, 2007; Blackhurst et al., 2011), Predefined decision plan (Knemeyer, Zinn, & Eroglu, 2009; Zsidisin and Wagner, 2010; Blackhurst et al., 2011) and Diversification (Christopher, 2004) which are received least attention by scholars.

Exchanging information along in supply chain, especial backward integration, by sharing information of supply, inventory level and purchasing schedules enables organisations to generate higher levels of supply intelligence and greater visibility of enhancing organizational performance. This dynamic capability –building process should be routine and embedded in the process of organisation to achieve and develop effective SC by exploitation (Benner and Tushman, 2003; Najafi et al., 2014). Thus, the following hypothesis is proposed:

***H_1.* Inventory management has significant positive influence on SC ambidexterity.**

As per stated by Lee and Rha (2016), visibility in SC will help to reduce complexity and uncertainty along SC. This will help and enhance to rapidly capture business opportunities, identify and react to risks and realign their resources and assets along the SC as part of SC exploitation and explorations. Sensing external and internal environment improves the organisations ability to evaluate and restructure business process effectively (Lacerda, Ensslin, & Dutra, 2014; Simatupang, Wright, & Sridharan, 2002). The following hypothesis is developed:

***H_2.* Visibility has significant positive influence on SC ambidexterity.**

Timely decision making part of SC agility (Lee and Rha, 2016), decision plans to deal with SC problems, for instance, delivery issues, customers dissatisfaction, lead time problem. Predefined decision plan allows to quickly dealing with conflicts in the strategic decision-making process and improves responsiveness of organisation toward market change. This will help to enhance high level of exploitation and exploration performance goal (Eltanway, 2016), Thus following hypothesis is proposed;

***H_3.* Predefined decision plan has significant positive influence on SC ambidexterity.**

Diversification in term of procurement strategies part of achieving SC resilience (Pereira, Christopher, & Da silva, 2014). The flexible procurement system (Multi sourcing) to respond to changes leads to high level of ambidexterity. This is because flexibility considers a key element for adaptation and its can play essential role sourcing and reducing resource delivery time with quality materials. Thus, the following hypothesis is suggested;

***H_4.* Diversification has significant positive influence on SC ambidexterity.**

3. Research Methodology

A survey instrument was developed to investigate the impact of SC ambidexterity on the SMEs in manufacturing sector. The questionnaire was pre-tested several times to ensure that the wording, format and sequencing of questions were appropriate. Data for this study were collected from a sample of 166 medium manufacturing SMEs operating in Malaysia. The actual estimation of samples is 200 from total establishment of 2,061. 2 questionnaires are rejected due to insufficient of information, double entry of information and in complete of answers. Only 164 questionnaires are analyzed. Confirmatory factor analysis (CFA) and structural equation modelling (SEM) were run on SPSS (version 21.0) and AMOS (version 22.0) to test the hypotheses developed to answer research questions.

For this research, the electronic questionnaire (Online questionnaire, send via e-mail to participants) considered as suitable method to collect the data. Basically the set of questionnaire send via e-mail to respondents, it was requested that the questionnaire be completed by a senior officer/ executive in charge of Supply Chain Management (SCM). This is mainly because they can use their own personal computers to respond the questions. This method considers fast reach all participants at a same time, inexpensive and the participants can response to questions at their own convenience (Sekaran, 2013). But the participants must computer literacy; it is believes that the respondents are mostly from top level executives and no doubt on their computer knowledge. Another problem highlighted by Sekaran (2013) in this method is the willingness of respondent to complete the survey.

Commonly, for this kind of method the responses are typically low and Sekaran (2013) stated 30% response considered acceptable. To avoid poor response, the set of questionnaire send to entire population in medium category of SMEs (total 2,061) and considered the first 200 (10%) respondents as samples. According to Sekaran (2013), "As a rule of thumb, sample sizes larger than 30 and less than 500 are appropriate for most research" (p.296). Concerning on this limitation, the sample size that considered for this research is 200 participants from total establishment SMEs (Medium) in manufacturing sector. This considers as 10 percentages of the establishment.

The details of participants gather from latest updated version of Malaysia SME Business directory. This directory provides all information pertaining with establishment of SMEs in Malaysia such as SMEs latest listing with name, address, contact details (e.g. Tel No, E-mail) and their

business nature. In the same time, provides the contact person details such as Owner of the company, Director of company and Managers. Basically the researcher uses this business directory to obtain the contact details and all this information are available in CD-ROM and provides full details or the business guide of Malaysian SMEs. The details of SMEs are well organized and easy to excess from this directory. There searchers considered send the questionnaire to respondents early as possible to provide around five (5) to six (6) weeks to response. Furthermore, second reminder sends to all respondents to invite them to participate in the survey. This helped to reduce the poor response and have achieved the desire sample requirement. The following Table 1 shows the constructs and items measures.

Table 1. Measurement items

Constructs and item measures
Inventory Management
INM1 :we can perceive demand shifts and can adjust stocks effectively
INM2 : we can reconfigure the inventory in time to address environmental change
INM3 : we can quickly increase and reduce inventory based on demand
INM4 : we can effectively manage materials cost and source of supply
INM5 :we can successfully build collaborative relationship with suppliers to manage inventory
Visibility
VIS1:we can perceive demand shifts and changes in customer preference before competitors do
VIS2 : We can fully understand the impact of internal and external environment
VIS3:We can feel the major potential opportunities and threats in our SC
VIS4: we have good observation and judgment ability in our SC
VIS5:We have perfect SC information management system
Predefined decision plan
PDP1: we can quickly deal with conflicts in the strategic decision-making process in our SC
PDP2:under any circumstance we can make timely decisions to deal with SC problems
PDP3: we can reconfigure resources in time to address environmental change
PDP4 : we can quickly adjust delivery capability and reliability
PDP5: we can quickly improve responsiveness to changing market needs
Diversification
DIV1: we can successfully realign or reinvent SC in response to market change
DIV2 :we can successfully reconfigure SC resources to come up with new productive assets
DIV3: we are able to engage in resource re-combinations to better match the product-market areas in this SC
DIV4: we can effectively integrate and combine existing resources into novel combinations SC
DIV5: we can rapidly send and receive products cost effectively as customers and sources of supply change
SC ambidexterity
SCA1: In order to stay competitive, our SC managers focus on reducing operational redundancies in our existing processes.
SCA2: In order to stay competitive, our supply chain managers focus on improving our existing technologies
SCA3:Leveraging our current SC technologies is important to our firm's strategy
SCA4 : Our managers focus on developing strong competencies in our existing SC processes
SCA5: we proactively pursue new supply chain solutions
SCA6:we continually experiment to find new solutions that will improve our SC
SCA7: To improve our SC, we continually explore new opportunities
SCA8 : we are constantly seeking novel approaches in order to solve SC problems

4. Results

4.1. Measurement Model

As per suggested by Andreson and Gerbing (1988), Confirmation Factor Analysis (CFA) was undertaken to examine the measurement model before structural model was analysed. The items that contributed to a standardized coefficient with values less than 0.50, and the overall fit statistics of measurement model acceptable fits.

The convergent validity was confirmed because all of the standardized estimated were significant at the 0.001 level and the *t*-value was greater than the threshold of 1.96 (Anderson and Gerbing, 1988) as shown in Table 2. The AMOS output provides the t-value as a critical ratio value that can be calculated by dividing the estimated covariance by its standard error. Furthermore, all values of AVE, the construct relative to the total amount of variance, were greater than the recommended value of 0.5. Discriminant validity can be assured by comparing AVE with the squared correlation between constructs. Thus, discriminant validity was established (refer to Table 4)

Table 2. Measurement model result

Constructs and item measures	Cronbach's α	Composite reliability	AVE	Mean	SD	Standardized factor loading	CR	*p* -value
Inventory management	0.823	0.804	0.512	4.73	0.78			
INM1				4.73	0.99	0.605	fixed	
INM2				4.79	0.91	0.651	11.383	<0.001
INM3				4.69	0.97	0.808	9.731	<0.001
INM4				4.73	0.98	0.774	9.653	<0.001
INM5				4.75	1.02	0.873	9.768	<0.001
Visibility	0.785	0.802	0.512	4.78	0.79			
VIS1				5.03	1.35	0.803	fixed	
VIS2				5.12	1.33	0.795	14.737	<0.001
VIS3				4.84	1.36	0.514	8.969	<0.001
VIS4				4.95	1.34	0.712	12.937	<0.001
VIS5				5.13	1.35	0.785	11.819	<0.001
Predefined decision plan	0.863	0.879	0.548	4.97	0.84			
PDP1				4.98	1.08	0.733	fixed	
PDP2				4.97	1.01	0.793	13.437	<0.001
PDP3				4.99	1.01	0.764	12.986	<0.001
PDP4				4.97	1.06	0.786	13.367	<0.001
PDP5				4.99	1.09	0.663	11.24	<0.001
Diversification	0.916	0.911	0.563	3.33	0.92	0.717	fixed	
DIV1				3.31	1.16	0.744	15.489	<0.001
DIV2				3.33	1.14	0.732	12.332	<0.001
DIV3				3.41	1.23	0.734	12.317	<0.001
DIV4				3.43	1.11	0.803	13.526	<0.001
DIV5				3.28	1.19	0.768	11.424	<0.001
SC ambidexterity	0.883	0.887	0.567	4.78	8.11	0.715	fixed	
SCA1				4.69	1.02	0.712	14.392	<0.001
SCA2				4.84	1.05	0.745	12.391	<0.001
SCA3				4.77	0.95	0.734	11.882	<0.001
SCA4				4.73	1.03	0.732	13.663	<0.001
SCA5				4.82	1.01	0.827	13.128	<0.001
SCA6				4.84	0.96	0.834	12.111	<0.001
SCA7				4.79	1.04	0.745	11.453	<0.001
SCA8				4.89	1.06	0.783	11.654	<0.001

Notes : AVE, Average variance extracted =$\sum$(factor loading^2) / ($\sum$ (factor loading^2) + $\sum$(error));
composite reliability = $\sum$ (factor loading)^2/($\sum$(factor lading)^2 + $\sum$ (error))

Table 3. Significant path coefficients in the model

Hypothesized path	Path coefficient	SE	p-value	Result
H1: Inventory Management - SC ambidexterity	0.458	0.075	0.000**	Supported
H2 : Visibility - SC ambidexterity	0.772	0.157	0.000**	Supported
H3 : Predefined decision plan - SC ambidexterity	0.611	0.564	0.000**	Supported
H4 : Diversification - SC ambidexterity	-0.364	0.055	0.000**	Supported
Notes : ***p <0.05; **p < 0.001***				

Table 4. AVE and correlation

Constructs	AVE	Inventory Management	Visibility	Predefined decision plan	Diversification	SC ambidexterity
Inventory management	0.51	1				
Visibility	0.51	0.395**	1			
Predefined decision plan	0.54	0.344**	0.652**	1		
Diversification	0.53	0.235**	0.362**	0.271**	1	
SC ambidexterity	0.61	0.267**	0.645**	0.623**	0.547**	1
Notes : ***n = 166. *p <0.05; **p < 0.01 (two-tailed)***						

Table 5. Curve estimation and construct

Construct	Linear Value (R)	R^2	Quadratic Value (R)	R^2
Inventory management	0.81	0.656	0.811	0.658
Visibility	0.795	0.633	0.797	0.634
Predefined decision plan	0.775	0.601	0.779	0.606
Diversification	0.784	0.615	0.784	0.615
comparing with SC ambidexterity			**0.793 (average value)**	

Cronbach's α was calculated to identify reliability score for each construct using equal factor weighting (refer to Table 2). The table clearly shows that all construct values more than 0.75 and its consistency is well assured. Furthermore, composite reliability as well was used to justify the degree to assure which scale indicators reflect and underlying factor. As per shown in Table 2 the composite reliability values were greater than the recommended value of 0.6, this as well assured the reliability of construct.

4.2. Structural Model

The structural model was used to analyze to test the research hypothesis after the justification of reliability and validity test. The results of structural model as shown in Table 3, according to the results, generally there are positive and significant path loadings liking elements of SC resilience to SC ambidexterity except Diversification. For instance, Inventory management to SC ambidexterity (β = 0.458, p < 0.001) (H_1), Visibility to SC ambidexterity (β=0.772, p <0.001) (H_2), Predefined decision plan to SC ambidexterity (β = 0.611, p < 0.001) (H_3) and Diversification to SC ambidexterity (β = -0.364, p < 0.001) (H_4).

Hypotheses H_1 *to* H_3 were posited to investigate the dynamic SC resilience capability-building process well established. The SEM showed a positive link between the first four elements of SC resilience towards SC ambidexterity. This clearly shows there is positive significant relationship between SC resilience and SC ambidexterity. Besides, Hypothesis H_4 suggested that the negative impact of Diversification would be negatively associated with SC ambidexterity. The results showed a negative link between the two construct.

4.3. Curve Estimation

The Quadratic method was performed on the SC resilience against SC ambidexterity in order to extract the dimensions underlying each construct. The main reason is to identify the value of R either correlated and the strength and direction of the linear relationship. The R tends to optimistically estimate how well the model fits the sample in this study. The following R value presents the linear relationship between SC resilience against SC ambidexterity. The average value of R (Quadratic value) construct is 0.79.

5. Conclusions

Inventory management allows SMEs to share information with supply partners and effectively manage and control, planning, scheduling, and delivery the inventories in turn improving their ability to react quickly to unexpected risks chances to strengthen capabilities .Consistent with this idea, the empirical results confirmed that Inventory management is positively associated with SC ambidexterity. Visibility in SC leads to greater flexibility in adapting dynamic situations as such good observation and judgment ability in SC to feel

the major potential opportunities and threats in SC. There was significant direct relationship between SC ambidexterity as well. Predefined decision or contingency plans as well as communication protocols to decrease response time and reduce mistakes during execution for instance, can quickly deal with conflicts in the strategic decision-making process in SC and quick improve responsiveness to changing market needs (Knemeyer et al., 2009; Zsidisin and Wagner, 2010; Blackhurst et al., 2011). Thus, predefined decision plan provide direct effects towards SC ambidexterity as per suggested by Gibson and Birkinshaw (2004) that ambidexterity arises from the unit or organisational context and process. The fact that Diversification was not significantly related to SC ambidexterity is contrary to the hypothesis. Even the diversification perceived as element of SC resilience by providing additional resources diffuse impacts of disaster and also improves preparedness and this consider part of approach of ambidexterity (Eltantawy, 2016).

Overall, the findings provide substantial empirical support for the idea that a dynamic SC resilience capability-building process in based on positive relationship with SC ambidexterity. Based on the organisational resiliency view, this research found that diversification is negatively related to the impact of SC ambidexterity. This implies that diversification not a really proper mitigation or recovery strategy to address SC ambidexterity.

6. Theoretical and Managerial Implications

This research makes two theoretical contributions to the SCM literature. First, this research applied the concept of resilience as dynamic capability to SCM. Dynamic capabilities are not congenital but can be developed through a well-reutilized organizational process for long-term performance improvement (Schreyogg and Kliesch-Eberl, 2007; Teece, 2007). Through a SCM literature review, this research suggested that in order to develop dynamic capabilities along SC, firms should enhance inventory management, visibility, predefined decision plan and diversification.

Second, the research results showed that a dynamic SC resilience capability-building process in an antecedent of SC of ambidexterity. The strategy literature classifies antecedents of ambidexterity into three levels; structural, contextual and strategic (Gibson and Birkinshaw, 2004; Simsek et al., 2009). In this research, dynamic SC resilience capability-building process comprising inventory management, visibility, predefined decision plan and diversification facilitates SC ambidexterity at the contextual level. The contextual behaviour is a capability to pursue alignment and adaptability simultaneously across a business unit (Gibson and Birkinshaw, 2004).

This research as well provides some managerial insights to SMEs. SMEs should continuously search for novel approaches to solving SC issues. Implementing exploitative strategies focussed on existing core competencies is easier than searching for new opportunities (Groysberg and Lee, 2009). SMEs that make an effort to search for new opportunities along the SC are more likely to be able to quickly handle difficult situations. Morever, exploration is a risk-taking strategy (Gibson and Birkinshaw, 2004; He and Wong, 2004). SMEs tend to focus on developing stronger competencies in existing SC processes and ignore the importance of actively seeking out new technologies for SC systems.

7. Limitation and Future Research

Even though the research was well and carefully planned and executed, there are several limitations are acknowledged in this study. The first limitation concern is the generalization of outcome of research. The study on SMEs (Medium manufacturing sectors) that might have specific characteristics those are not suitable for other SMEs. It is also possible those only focus on few manufacturing sectors rather than overall is a source of bias. Further research is recommended to apply the framework to further focus on more different sectors of SMEs as a means of strengthening and enriching the research findings.

The second limitation there is various antecedents of SC ambidexterity are excised. Therefore further research should investigate different antecedents of SC ambidexterity to enlarge and enrich knowledge gaining in SCM. Thirdly, the use of the methodology presented in this study is the ability to generate the necessary data from participants, but may be circumstances where some participants are reluctant to share their information accordingly. Further study should concern on the effective methodology to attract more participants. In the same time the data should be collected at different time period, which leads to causal inferences because it satisfies temporal precedence. Thus, for future research, data should be collected in a consecutive order.

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