Dynamic Capabilities and Innovation in Supply Chains

Maree Storer
University of Queensland
m.storer@business.uq.edu.au

Paul Hyland
Queensland University of Technology
paul.hyland@business.qut.edu.au

Abstract
Supply chain relationships between firms are increasingly important in terms of both competitiveness and developing dynamic capability to respond to rapid changes in the market. Innovation capacity both in firms and in supply chains is also integral to responding to dynamic markets and customer needs. This explorative research examines a sample of firms active in supply chain relationships in Australia, as a pilot study, to examine any linkages between firm dynamic capabilities and supply chains developing innovative capacity to meet competitive and market changes. Initial findings indicate that although firms focus on developing capabilities, particularly dynamic capabilities to innovate individually, these preliminary findings indicate little reliance on developing their supply chain innovation capacity. This study is the initial stage of more extensive research on this topic.

Key Words: Supply chain relationships; innovation; dynamic capabilities

INTRODUCTION
Recent management literature suggests that relying on just the individual or the single focal organisation for economic and industry competitiveness is unsustainable (Hamel, G. and Breen, B., 2007). Adopting a strategic approach to developing supply chain relationships (Miles, R. E. and Snow, C. C., 2007) are seen as critical to survival for many firms. Additionally, the literature indicates that varying types and natures of supply chain relationships, such as coordinating, cooperating, partnering and collaborating within supply chains (Lambert, D. M. and Knemeyer, A. M., 2006a, Lee, C. W. et al., 2007, Maloni, M. A. B., C., 2000, Parry, G. et al., 2006, Skjoett-Larsen, T., 1999), affects supply chain relationships. Particularly, the range of intra and inter-organisational competence (Blomqvist, K. and Levy, J., 2006), and dynamic capabilities (Eisenhardt, K. M. and Martin, J. A., 2000, Petroni, A., 1998, Rothaermel, F. T. and Deeds, D. L., 2006, Savory, C., 2006, Teece, D. J. et al., 1997, Zott, C., 2003) available from its participants. These capabilities are most relevant in terms of the supply chain developing an innovation capacity, which is often the catalyst to realign to meet the needs of new or emerging conditions in the market, and develop new market trajectories (Storer, M. et al., 2007). The aim of this research is to explore further supply chain relationships and how dynamic capabilities influence developing innovation capacity through the supply chain.

This research examines dynamic capabilities in the context of a supply chain, which includes the firm. Whilst acknowledging the supply chain as a whole does not enact all
its capabilities, this study argues that the application of dynamic capabilities requires both the abandoning of old configurations and the development of new configurations to maximise its innovation capabilities (Stevenson, M. and Spring, M., 2007). This study explores the ability of the supply chain to use and re-configure its intra and inter-organisational competence according to changes in the supply chain’s environment and strategic direction. An existing framework, combining work based on modelling the degree of change (Iacobucci, D., 2008), and ‘best value’ supply chain management (Ketchen, D. J. and Hult, G. T. M., 2007), supports the exploration of a series of supply chain dynamic capabilities, and analysis of the changes experienced by a supply chain firms across a continuum. This degree of change ranges from a low to medium to high degree of change, by addressing two main questions:

Q1 How does the nature and type and relationships between firms in the supply chain influence the intra and inter-organisational competence to develop dynamic capabilities of a supply chain?

Q2 What dynamic capabilities do firms develop to create innovation capacity within a supply chain?

MANAGING RELATIONSHIPS AND INNOVATION CAPACITY IN THE SUPPLY CHAIN

Recent organisational literature has bridged supply chain management and strategic management literature to argue competition no longer revolves around individual organisations; the supply chain is increasingly becoming the focus of competition in the market (Crook, T. R. and Combs, J. G., 2007, Holcomb, T. R. and Hitt, M. A., 2007). As globalisation drives rapid change in all aspects of market and company operations, strategic supply chain relationships are seen as critical to high performance and developing innovation capacity to meet both supply and demand (Soosay, C. A. et al., 2008, Wang, W. Y. C. et al., 2007a, b, Wang, X. J. and Peng, J. S., 2008). Historically, supply chain management thinking has been informed by knowledge from narrow functional areas, yet continues to be largely eclectic, with little consensus on its conceptualization and research methodological bases (Burgess, K. et al., 2006). Few if any studies address the issue, of the supply chain as the competitive force, from the perspective of the supply chain as the source of innovation capacity, or as the unit of analysis, with the bulk of research to date focussed on the individual firm. There also appears to be few if any studies that explore the core proposition at the heart of this research- that supply chain relationships are strategically assembled by firms to acquire resultant competences and capabilities, particularly dynamic capabilities that ensure competitive advantage through the innovation capacity of the supply chain. This proposition is the subject of this exploratory study and articulated in Figure 1.
The Nature and Type of Supply Chain Relationships
Supply chain relationships are groups of organisations entering into business relationships in order to secure supply and demand as part of a market dynamic (Lambert, D. M. and Knemeyer, A. M., 2006b).

Competitive supply chain relationships, for example, describe those rivalries between supply organisations and units, within the same supply chain, for resources and capabilities (Barney, J., 1991a), in order to supply to an end user client. It also describes organisations competing indirectly, with those who substitute and develop product substitutes that may not be similar to one another on a superficial basis, but are similar in terms of their use (Peteraf, M., A. and Bergen, M., E., 2003). Alternatively, cooperative relationships are the opposite to competition as relational states, and describe different levels of interdependence amongst supply chain firms, such as formal and informal states of coordination, partnerships, collaboration, and coopetition within a supply chain, as they converge interests and strive to derive mutual benefits (Contractor, F. J. and Lorange, P., 1988).

Coordinated supply chain relationships are the simplest form of cooperation between supply chain partners, often represented as a transactional, arms-length relationship, typically contractual and formal by nature, and exemplified in 3rd party and 4th party logistics relationships (Gattorna, J. et al., 2003, Skjoett-Larsen, T., 2000). Suppliers contract to outsource all or part of a supply chain activity, such as logistics to a coordinating supplier, which might include individual transport and warehousing needs or involve a totally integrated service from production to delivery of an end use product or service.

Other cooperative relationships described in the literature are partnerships, which for the purposes of this research, describe more formal and integrated relational states. Partnerships are the easiest method of finding varying levels of alignment and integration within supply chain relationships, due to the limited number of participants in the relationship. Supply chain partnerships are those that share formal, specific, strategic, and/or operational objectives within the chain. Partnerships can occur between either competitive or non-competitive relationships, at either the vertical or the horizontal levels within the chain. Partnerships are those supply chain relationships that are specific to either dyadic, two-way formal supply chain relationships (Gulati, R., 1995, Gulati, R., 1998, Gulati, R., Nohria, N., Zaheer, A., 2000) or triadic, three way formal relationships (Madhavan, R. et al., 2004), and share a high degree of integration through mutual and specific agreements.
Collaborations on the other hand, for the purposes of this research, refer only to demand, supply or combinations of those types of supply chain relationships that are greater than the sum of dyadic or triadic partnerships. Although it is acknowledged that in the literature, predominantly partnerships and collaborations are used in the same context and more often than not used interchangeably (Holweg, M. et al., 2005, Maloni, M. J. and Benton, W. C., 1997). Collaborative relationships also involve high levels of integration and cooperation, through aligned and formalised intra and inter-dependent relational states within each supply chain unit (Noordewier, T. G. et al., 1990), but are greater in number than those found in a dyadic or triadic partnership. Through all levels of formal cooperation in supply chain relationships, this process can involve sharing research and development activities, strategic management initiatives, personnel, innovation activities, supply chain functions, processes, and systems, in order to affect supply and demand requirements from the market. Although competitive supply chain relationships are more likely to occur predominantly across the horizontal axis of the supply chain, with cooperating relationships occur more readily within the vertical axis, this is not always the case, as competitors within a supply chain can cooperate - a relationship described as coopetition (Brandenburger, A. M. and Nalebuff, B. J., 1996). Bridging competition with cooperation in supply chain relationships, has seen the development of the term coopetition (Brandes, O. et al., 2007), and represents a good example of formalised cooperation in the form of either a partnership or a collaboration of broader proportions, but specifically between competitors operating in the same supply chain. Originally based on games theory (Brandenburger, A. M. and Nalebuff, B. J., 1996), it describes competitor relationships that align and share resources through formal agreements framing the relationships between competing firm on how cooperation and collaboration will take place. These activities are identified and formalised in order that the individual competitive advantage of each partner or collaborator is not diminished, and to ensure the relationship delivers enhanced performance and profitability to each competitor (Dagnino, G. B. and Padula, G., 2002).

Additionally, the literature notes that competitors in a supply chain remain fierce in relation to the end customers, yet information trades openly in other areas that drive down total costs through activities such as, working together in early stage innovation processes, developing economies of cost and scale, or influencing government policy. Co-operating organisations within a supply chain can develop interdependences over either short, medium, and longer terms, and agree to share capabilities, resources, and information through contractual or non-contractual means, or a mixture of both. While misaligned supply chain relationships often cause operating income to drop over time, return on sales to fall and return on assets to decrease (Wadhwa, S. et al., 2008), producing a slowing in overall sales growth, higher total landed costs and increasing inventories (Blanchard, D., 2007). Figure 2 outlines the interplay between relationship factors of the supply chain, such as the nature and types of relationships, their longevity within a supply chain, and the types of business exchanges expected (developed through an adaptation of work by Wagner and Boutellier, 2002). It depicts short-term, arms length and purely transactional supply chain relationships (Barney, J., 1991a, b) can be influenced by various levels of and strategic management through intent (Hamel, G. and Prahalad, C. K., 1989) and integration (Spekman, R. E. et al., 1998). This often leads to more formalised medium to long-term partnerships and collaborations (Lambert, D. M. et al., 1996), between both competitors and non-competitors.
Supply Chain Innovation Capacity - Dynamic Capabilities

Supply chain innovation capacity describes the intra and inter-organisational competence within a supply chain to cooperate, to identify, develop, and implement original, solution-oriented actions that address new or previously unsolved problems (Storer, M. et al., 2007). Employing a supply chain’s innovation capacity indicates the willingness of groups of actors within the supply chain to take steps, or perform activities that ultimately produce output that improves or changes current activities to meet a market need or new trajectory. This research proposes the supply chain, like the firm, uses innovation to provide unique value adding solutions for the supply chain that provides a market competitive advantage. The innovation capacity of the supply chain is driven by the choices made through intra and inter-organisational cooperation in respect of an innovation episode (Clark, P. et al., 1992) and its deployment.

The ability to acquire and utilise knowledge effectively is critical for a supply chain’s innovation activities and performance (Cohen, W. and Levinthal, D., 1990). The way knowledge processes are managed within and between businesses has emerged as a major theme in recent research (Jantunen, A., 2005). Firms are increasingly dependent on their customers, suppliers and even competitors as initiators of product and process improvement and sources of new ideas (Von Hippel, E., 1988). In order to utilise externally generated knowledge businesses have to internalise it and then combine the information and new insights with the existing knowledge base. The dynamic capability view of a supply chain conceives the business as a knowledge processing and utilising entity (Teece, D. J. et al., 1997). The dynamic capabilities approach explains “how combinations of competences and resources can be developed, deployed and protected” (Teece, D. J. et al., 1997) to create firm-specific capabilities that can provide a competitive advantage. Actors in supply chains need to be able to recognise changes in the environment and utilise opportunities that evolve to meet changing market demands. According to (Savory, C., 2006) supply chains do not only need to reconfigure existing capabilities and resources to meet strategic and environmental changes, they must relinquish old configurations in developing the newly reconfigure capabilities.

Figure 2: Degrees of exchange between supply chain relationships adapted from Wagner & Boutellier (2002).
The growing intensity of competition has forced many supply chains to focus on their resources and capabilities to survive and excel in dynamic markets. This research refers to resources as those tangible and intangible assets in the organisation or the participating firm of the supply chain (Maijoor and Van Witteloostuijn, 1996); whereas capabilities refer to the firm’s ability to exploit, combine and reconfigure those resources. Dynamic capabilities occur when assets, abilities and competencies are used to create strategies and activities that address specific markets and customers needs in distinctive ways (Eisenhardt and Martin, 2000). These capabilities are the driving force for innovation in some supply chains, because they can generate, evolve and recombine resources into new sources of competitive advantage (Teece et al., 1997). To understand the relationships between dynamic capabilities and innovation, it is important to recognise what Prieto and Easterby-Smith (2006) see as the link between knowledge and dynamic capabilities. They maintain that the dynamic capabilities that enable and underpin long-term ongoing renewal require both exploitation of pre-existing knowledge and exploration of “new knowledge-based competences” (Prieto, I. and Easterby-Smith, M. P. V., 2006). New knowledge and technologies, as well as existing knowledge and technologies, over time translate into meaningful operational process, practices and systems.

**METHODOLOGY**

The study reported in this article is an exploratory pilot study across a small sample of Australian companies, developed from data collected through a self-administered questionnaire sent by email to a purposive sample of 200 organizations. These companies were limited to those actively involved across the broad spectrum of supply chain activities and relationships, and following receipt of the questionnaire and after telephone follow-up, 32 respondents returned completed questionnaires. Respondents represent the core areas of supply chain activities (production, processing and manufacturing, logistics, wholesaling, retailing and services) and come from senior levels within the organizations engaged. As the study sample size is small and descriptive statistics utilized, the results only provide basic indications of how some firms relate to their supply chain in terms of dynamic capabilities and innovation capacity, and will form part of a much larger study. Therefore, non-parametric tests that are more suitable to larger sample sizes are not used. Descriptive ranges utilized in this study relate to the levels of importance the firms attach to the relevant topics, from no importance to moderate importance to high importance, or not applicable at all.

**DISCUSSION OF RESULTS**

Generally, although this is a small study, many of the respondent firms were developing or attempting to develop strategic supply chain relationships over the longer term, particularly through supply chain partnerships as opposed to larger scale collaborations. Over 50% of firms indicated they were always seeking to form long-term two or three-way contractual partnerships, with only 30 % were involved in short term contracts. However, even less (< 17%) were involved on a regular basis in cooperative arrangements with competitors (coopetition). In terms of actual capabilities identified in the literature as important to firms establishing supply chain relationships, only 49% of respondents maintained it was important to develop joint strategic routines. In terms of
developing supply chain innovation capacity, shared learning was important, as is developing joint R&D and innovation capability (Table 4). None the less more than 52% of firms maintained it was very important or critically important to remain at arm’s length from partners in operational routines, which appears contradictory to overall intent to develop supply chain capability. Exploring firm attitude to supply chain cooperation, Table 1 shows the level of importance respondent firms place on alignment and integration activities identified in the dynamic capabilities literature as integral to partnering or collaborating for competitive advantage. Interestingly, more than 53% of firms maintain that developing joint capabilities to respond to market changes is of high importance. However, contradicting this are the low numbers of firms identifying the need to align other strategic and innovative activities with supply chain partners of high importance.

Table 1: Supply chain maintenance activities

<table>
<thead>
<tr>
<th>Activities that are important in maintaining supply chains</th>
<th>Low importance</th>
<th>Moderate importance</th>
<th>High importance</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligning functions across supply chain organisations</td>
<td>16.13%</td>
<td>25.8%</td>
<td>53.3%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Aligning complementary organisational capabilities</td>
<td>19.35%</td>
<td>29.0%</td>
<td>46.6%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Integrating and aligning communication and information systems</td>
<td>16.13%</td>
<td>32.3%</td>
<td>49.9%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Integrating logistics across supply chain organisations</td>
<td>9.68%</td>
<td>32.3%</td>
<td>53.3%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Integrating governance and quality systems</td>
<td>16.13%</td>
<td>29.0%</td>
<td>49.9%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Aligning management strategies</td>
<td>22.58%</td>
<td>29.0%</td>
<td>40.0%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Aligning financial capability</td>
<td>32.26%</td>
<td>32.3%</td>
<td>26.6%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Integrating and aligning research, development and innovation capability</td>
<td>25.81%</td>
<td>45.2%</td>
<td>23.3%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Developing collective market strategies</td>
<td>22.58%</td>
<td>48.4%</td>
<td>20.0%</td>
<td>9.7%</td>
</tr>
<tr>
<td>Developing joint capability to respond to changing market conditions</td>
<td>0.00%</td>
<td>38.7%</td>
<td>53.3%</td>
<td>9.7%</td>
</tr>
</tbody>
</table>

In terms of dynamic capabilities required to develop supply chain innovation capacity, the literature identified that supply chain actors need to be able to react to change and realign their capabilities to address changes in the market. Table 2 provides an indication of the respondents’ attitudes toward adapting, reconfiguring and coordinating capabilities to meet supply chain market needs. Although more than 60% of firms in this study see these areas as highly important, few saw coupling and decoupling supply chain relationships to acquire a different mix of resources and capabilities (<25%) in the same light. Aligning functions to meet supply chain demands (56% of respondents) is also very important, although this is not aligned with ensuring the ability to acquire/shed resources and capabilities on demand (31%).

Table 2: Supply chain dynamic capabilities to meet changing markets and customer requirements

<table>
<thead>
<tr>
<th>Supply chain dynamic capabilities to meet changing markets and customer requirements</th>
<th>Low Importance</th>
<th>Moderate importance</th>
<th>High importance</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to align functions with supply chain demands</td>
<td>6.25%</td>
<td>28.13%</td>
<td>56.25%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to align infrastructure requirements with supply chain demands</td>
<td>9.38%</td>
<td>28.13%</td>
<td>53.13%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to align human resources and capabilities with supply chain demands</td>
<td>9.38%</td>
<td>28.13%</td>
<td>53.13%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to adapt processes, products and systems to market and customer needs</td>
<td>3.13%</td>
<td>18.75%</td>
<td>65.63%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to reconfigure/recombine resources and capabilities on demand</td>
<td>3.13%</td>
<td>21.88%</td>
<td>62.50%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to coordinate and integrate resources and capabilities on demand</td>
<td>3.13%</td>
<td>21.88%</td>
<td>62.50%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to develop individual and group barriers to market imitation</td>
<td>25.00%</td>
<td>21.88%</td>
<td>40.63%</td>
<td>12.50%</td>
</tr>
</tbody>
</table>
Supply chain dynamic capabilities to meet changing markets and customer requirements

<table>
<thead>
<tr>
<th></th>
<th>Low Importance</th>
<th>Moderate importance</th>
<th>High importance</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to identify and react to market dynamics</td>
<td>3.13%</td>
<td>37.50%</td>
<td>46.88%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to acquire/shed resources and capabilities</td>
<td>15.63%</td>
<td>43.75%</td>
<td>31.25%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to couple and decouple supply chain</td>
<td>15.63%</td>
<td>46.88%</td>
<td>25.00%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to attract new combinations of resources</td>
<td>12.50%</td>
<td>21.88%</td>
<td>53.13%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to revamp existing operational capabilities</td>
<td>12.50%</td>
<td>18.75%</td>
<td>59.38%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to revamp existing strategic directions</td>
<td>9.38%</td>
<td>25.00%</td>
<td>56.25%</td>
<td>9.38%</td>
</tr>
</tbody>
</table>

Table 2: Market change capabilities

In terms of ensuring a supply chain competitive advantage through innovation capacity within the supply chain, various dynamic capabilities are more important than others are, in the minds of these respondents. Table 3 shows that maintaining a competitive advantage through supply chain activities is overwhelming through the development of a continuous improvement capability (>87%) and having the ability to develop and manage new technologies (>81%). Interestingly, taking into consideration the importance of climate change and the proposed carbon trading emissions scheme at this time, respondents did not see the ability to adapt and align to climate change and other environmental challenges as highly important (>46%).

<table>
<thead>
<tr>
<th>Supply Chain Innovation Capacity to ensure competitive advantage of supply chain</th>
<th>Low Importance</th>
<th>Moderate importance</th>
<th>High importance</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to realign supply chain relationships to create new capability and</td>
<td>15.63%</td>
<td>31.25%</td>
<td>40.63%</td>
<td>12.50%</td>
</tr>
<tr>
<td>resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to create a new vision and strategic direction and manage for change</td>
<td>9.38%</td>
<td>15.63%</td>
<td>62.50%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to successfully create implement and transfer new ideas across supply</td>
<td>6.25%</td>
<td>25.00%</td>
<td>56.25%</td>
<td>12.50%</td>
</tr>
<tr>
<td>chain relationships</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to harness internal and external organizational intelligence to create</td>
<td>0.00%</td>
<td>34.38%</td>
<td>50.00%</td>
<td>15.63%</td>
</tr>
<tr>
<td>new markets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to develop organisational structures and systems for changing demand</td>
<td>12.50%</td>
<td>25.00%</td>
<td>50.00%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to adapt to cultural shifts in line with new product, process or system</td>
<td>12.50%</td>
<td>18.75%</td>
<td>53.13%</td>
<td>15.63%</td>
</tr>
<tr>
<td>developments</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to develop and manage new technologies</td>
<td>0.00%</td>
<td>9.38%</td>
<td>81.25%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to continuously develop and manage incremental improvements and changes</td>
<td>0.00%</td>
<td>3.13%</td>
<td>87.50%</td>
<td>9.38%</td>
</tr>
<tr>
<td>to products processes and systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to adapt and align to climate change and other environmental challenges</td>
<td>15.63%</td>
<td>31.25%</td>
<td>40.63%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Ability to adapt and align to political and regulatory change and challenges</td>
<td>9.38%</td>
<td>25.00%</td>
<td>56.25%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to develop and implement financial and cost-benefit solutions for</td>
<td>3.13%</td>
<td>28.13%</td>
<td>59.38%</td>
<td>9.38%</td>
</tr>
<tr>
<td>changing market conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to develop and implement integrated logistics solutions for changing</td>
<td>12.50%</td>
<td>25.00%</td>
<td>46.88%</td>
<td>15.63%</td>
</tr>
<tr>
<td>market conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to develop and implement quality and monitoring systems</td>
<td>9.38%</td>
<td>9.38%</td>
<td>71.88%</td>
<td>9.38%</td>
</tr>
<tr>
<td>Ability to develop and implement full tracking and trace-back systems for product</td>
<td>15.63%</td>
<td>21.88%</td>
<td>46.88%</td>
<td>15.63%</td>
</tr>
</tbody>
</table>

Table 3: Supply chain competitive advantage activities

Finally, in terms of dynamic capabilities and creating a competitive advantage, while incremental innovation was critically important for competitive advantage at a firm level, this appears unsupported at the inter-group level of the supply chain, with only 39% of respondents raising this as highly important. An again also supported in this table was the fact that only 42% of respondents saw the ability for organisations within a supply chain to reconfigure and recreate resources and capabilities on demand as
highly important. Although over 64% of respondents do acknowledge the role that the ability of organisations within a supply chain to innovate internal resources and capabilities plays. Another important aspect, as related earlier, is the ability for individuals and groups within a supply chain to create new learning from each other (>57%). Similarly only 50% of firms felt it was highly important to align and integrate resources and capabilities as required on demand to meet the nature of business exchange and create new product, process and systems in the supply chain. It is apparent that these respondent firms in Australian supply chains focus more on innovation and improvement at the firm level than in utilising their relationships with their supply chain partners.

<table>
<thead>
<tr>
<th>Important capabilities to create a competitive advantage</th>
<th>No importance</th>
<th>Moderate importance</th>
<th>High importance</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ability for individuals and groups within supply chains to create new learning from each other</td>
<td>7.1%</td>
<td>32.1%</td>
<td>57.1%</td>
<td>3.6%</td>
</tr>
<tr>
<td>The ability for organisations within a supply chain to reconfigure and recreate resources and capabilities on demand</td>
<td>7.1%</td>
<td>46.4%</td>
<td>42.9%</td>
<td>3.6%</td>
</tr>
<tr>
<td>The ability of organisations within a supply chain to innovate by integrating resources and capabilities as required and on demand</td>
<td>7.1%</td>
<td>39.3%</td>
<td>50.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>The ability of individual organisations to innovate internal resources and capabilities for the competitive advantage of the supply chain</td>
<td>0.0%</td>
<td>32.1%</td>
<td>64.3%</td>
<td>3.6%</td>
</tr>
<tr>
<td>The ability of a supply chain to align and realign organisational resources and capabilities to meet the nature of the business exchange</td>
<td>17.9%</td>
<td>28.6%</td>
<td>50.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Develop intergroup relationships that create new product, process and systems development across the supply chain</td>
<td>21.4%</td>
<td>25.0%</td>
<td>50.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Develop intergroup relationships that develop continuous product, process and systems improvements across the supply chain</td>
<td>10.7%</td>
<td>46.4%</td>
<td>39.3%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Develop strategic practices that ensure new and continuous improvement in management and operational practices across the supply chain</td>
<td>10.7%</td>
<td>35.7%</td>
<td>50.0%</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

Table 4: Competitive advantage capabilities

CONCLUSION

This is an exploratory pilot study of Australian firms and their attitude toward developing dynamic capabilities and innovation capacity within the supply chain, with initial findings indicating that firms still firmly focus on their own individual innovation capacity. There is some recognition of the potential of aligning and developing supply chain innovation capacity through supply chain relationships, but the respondents in this study still appear conflicted in how that might happen. At the same time, the literature advocates that supply chains that have engaged effective organisational relationships, in the form of partnerships or collaborations, can and do create innovation capacity, by sharing competencies, capabilities and resources. This process often occurs in a dynamic and innovative manner in response to changes in the business environment or in response to customer demand. This study confirms that this is recognised, yet respondents did not rate it as highly important overall, particularly when compared to developing internal organisational capabilities and resources to innovate for a competitive advantage.

In the literature, loosely aligned supply chains are less likely to engage in strategic partnerships or large-scale collaborative relationships to innovate for a competitive advantage (Cox, A. et al., 2001, Fearne, A. A. H., D, 1999, Hyland, P., W., et al., 2003, Soosay, C. A. et al., 2008). While Coordinating, cooperating, partnering and
collaborating within supply chains, and adopting a strategic approach to developing supply chain relationships (Miles, R. E. and Snow, C. C., 2007) are seen as critical to survival in the literature and by some firms, the firms in this study have only recognised the benefits of long term partnerships. So it is not surprising that few firms have been able to bridge competition with cooperation in supply chain relationships, and engage in coopetition (Brandes, O. et al., 2007). It appears the respondents can see that strong relationships in the supply chain engender forms of formal cooperation and provide some impetus to improve competitive advantage for those involved, especially through continuous improvement and innovation practices. However, equally so, recognising weakly aligned supply chains fails, if sharing resources and transferring capabilities and competencies, particularly dynamic capabilities, are not highly important to developing a supply chain’s capacity to innovate in response to rapid changes in the market.

These initial findings form part of a broader study to inform and extend the existing theoretical models of Wagner & Boutellier (2002) and Ketchen et al., (2007), and understand whether firms can strategically develop intra and inter-organisational relationships within a supply chain to improve innovation capacity and competitive advantage. Particularly of interest is the ability of the supply chain actors to adapt, integrate and align new skills, resources and functional competences to match the requirements of a changing environment (Teece, D. J. et al., 1997) in a dynamic manner. These findings although not generalisable and limited through the small sample and scale of the study still provide good information for further research to determine if the findings apply to other supply chains both in Australia and internationally.

References


