

Supply Chain Uncertainty: An insight for Australian CEO's and Managers.

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Abstract

Supply chain excellence has become a key driver of value and competitiveness across most industries. Achieving this excellence can be a challenge for Australian businesses, particularly with its geographical position, significant dependency of its manufacturing operations at overseas locations, and the recent man made and natural disasters that have had significant impacts on businesses overseas, all of which can raise uncertainties and hence justifying the need for higher visibility in its supply chains.

Literature review indicates that little research work has been carried out in Australia that highlights the need for strategies to enable organisations to minimise supply chain uncertainties since the recent world events such as the September 11 attacks and SARS (Severe Acute Respiratory Syndrome). Whilst these events had minimal impact on Australian businesses or supply chains, there is no guarantee that it will be immune from such risks external to the supply chain.

This paper presents the factors that impact on the supply chain of Australian businesses. Finally the paper proposes contingencies for Australian supply chains to minimize its uncertainties.

Factors that impact on the supply chains of Australian Organizations.

Literature review indicated, supply chain excellence in the Asia Pacific region is interdependent between the countries categorised as developed countries, developing countries and as emerging markets. The main factors that impact on Australian supply chains include: the dependency on China for its low cost manufacturing operations, lead times for Australian companies, and the potential supply chain risks.

Australia's outsourced manufacturing operations in China

The migration of manufacturing operations from Australia to China has grown exponentially in the last 10 years indicating a substantial dependency for imports and partially assembled products through the process of postponement. In evaluating its risks, Sun Microsystems pointed out, directly or indirectly, many companies rely on components from China, Katz [16].

“When Australian mums and dads buy their kids a Paddle Pop, which turns 50 this year, at the beach this summer, few will bother to read the fine print on the wrapper. If they do they will see, close to the seam, the words ‘Made in China’ printed”, McDonald [8]. In the past three years, all

icy poles sold under the Australian brand, Streets, have been made in a Shanghai factory and the multinational owner, Unilever, says no jobs were lost in the move and claims a staggering 40 per cent cost reduction was achieved, even allowing for refrigerated shipping to Australia, McDonald [8]. In addition to Streets, McDonald [8], the other popular Australian icons that have relocated their manufacturing facilities to China with job losses include: 50 from Rheem, 900 from Sunbeam, nearly 800 from Email factories, hundreds from Otis and Schindler, more than 400 from Clyde Engineering and Goninans, and 60 from Barbeques Galore.

Lead times for Australian companies

The standard lead times for Australian companies importing raw materials or purchasing FMCG goods can vary between 4 weeks to 12 weeks or more. A minimum of 8-week lead-time is needed for the import of FMCG light bulbs from manufacturing plants in Asia into Australia by sea, Samaranayake and Mahadevan [19], whilst consumer goods like cameras, surgical implants and healthcare products are air-freighted and can take up to 4 weeks to arrive at the customers' site.

Whilst bulk of the manufacturing operations of Australian organizations have moved offshore, the remaining organizations engaged in manufacturing are highly dependent for sub assemblies, parts and raw material and this places a high degree of uncertainty on the Australian supply chains making JIT (Just in time) planning difficult in these circumstances and whilst in the event of disaster overseas there is a very high possibility of a stock out situation. While it may not be economically viable for organizations to carry six months worth of stock, it may be necessary to have more than one source of supply.

Potential Risks within a Global Supply Chain

Risks and uncertainties in supply chains may be categorized into five sub-chains/networks: physical movements and flows, financial - flow of cash between organizations, informational - the processes and electronic systems, relational - appropriate linkage between a supplier and resource parties, Cavinato [20]. Brannen. et.al [21], supply chain problems accounted for 25 % of the loss of revenue in the US.

The relocation of manufacturing operations to overseas locations and long lead times experienced in Australian supply chains can have significant impact with the possibility of a "bullwhip effect" and can occur when the demand order variability in the supply chain are amplified as they moved up the supply chain and distorted information from one end of a supply chain to the other leading to tremendous inefficiencies, Lee.et.al [22].

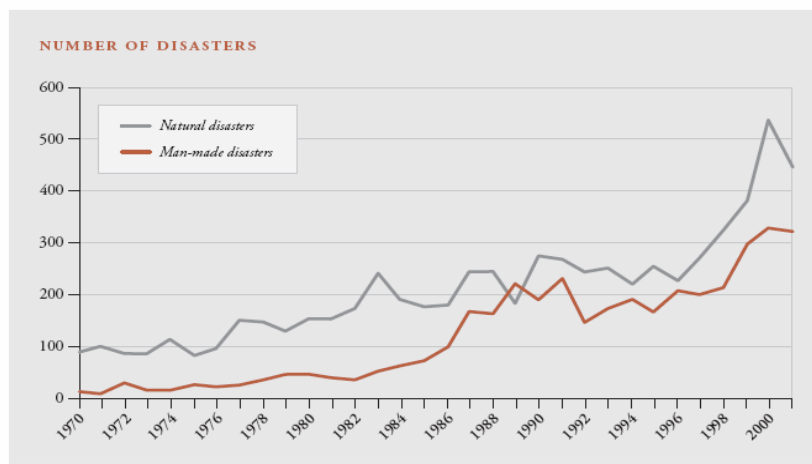
The bullwhip effect, Li.et.al [23], can be potential risk in supply chain management as it requires the players to hold excessively high inventory levels in order to meet boom and bust situations, and in addition the lack of synchronization between supply and demand increases not only the physical inventory but also the operating costs. Excess inventory hurts financial performance, Chopra and Sodhi [24], inventory risk itself hinges on the value of the product, its rate of obsolescence, and uncertainty of demand and supply.

The bullwhip effect may be treated as intrinsic risk contained within a supply chain that may be minimized and controlled whilst risks outside the chain as extrinsic include financial meltdowns, natural and man-made disasters, SARS, terrorism, and recently the "bird-flu" in Asia.

Risks external to the Supply Chain

Whilst the risks within a supply chain cannot be eliminated but may be minimized, businesses have little or no control over those risks external to the chain and this lack of control justifies the need for higher supply chain visibility. The tragic event of September 11, served as a wake up call to many companies that did not strategize about their exposure. Monahan et.al [25], Figure 2.0, provides a view of the number of man made and natural disasters since 1970 that have increased significantly. The effect on the supply chain as a result of natural disaster or a major accident, such as the outbreaks of Foot and Mouth Disease in Europe in 2001 and the earthquake in Taiwan in 1999 can be very similar to those of a large scale terrorist attack, Martha and Subbkrishna [26].

Terrorism and SARS have been the most significant recent events that have impacted businesses globally and should this trend continue, there would be a need for organizations to be prepared to manage the ongoing risks external to their supply chain. Terrorism accounted for 5 %, natural disasters 8 %, and fire and explosion 6 % for supply chain disruptions in the US, Brannen. et.al [21]



Source: Centre for Research on the Epidemiology of Disasters

Figure 2 Natural and Man made disasters

1. Terrorism

Terrorism is a man made disaster. Further to the September 11 attack, there is an ongoing concern of the likelihood of further attacks following the March 11 2004 train bombings in Madrid, and the two July 2005 bombings of London's transportation system, Sheffi and Rice [27].

Almost every supply chain was affected by the closure of US airspace, grounding of the planes, and by the closure of the borders that immediately followed due to the destruction of the Twin Towers, Sheffi. [28], and Toyota came within hours of halting production at its Sequoia SUV plant in Indiana, since a supplier operating on a JIT (Just-in-Time) basis was waiting for steering sensors shipped by air from Germany. Likewise the closure of the roads system forced Ford to shut down five of its U.S. plants partly because it could not get enough parts from suppliers in

Canada as trucks loaded with components were delayed at the Canadian and Mexican borders and the result was a 13 percent drop in production in that quarter Sheffi.et.al [29].

Whilst manufacturers and distributors in Australia had minimal impact as a result of the act of terrorism, in the long term, however organizations in the Asia Pacific region need to have a strategic vision to combat all possible scenarios as an incident of the similar magnitude of September 11 occurring in the region would have a significant impact on businesses. The car industry can possibly endure a shutdown and not meeting customer demands, healthcare or pharmaceutical industry on the other hand experiencing a similar situation will have disastrous effect on lives in general hence strengthening the case for higher supply chain visibility.

2. SARS (*Severe Acute Respiratory Syndrome*)

Almost every major manufacturer with a distribution outlet in Australia has a manufacturing base in China and the impact of SARS could have seriously impacted businesses and population through contamination, particularly in the food industry, however the impact was minimal.

The interdependency of global supply chains have been brought into sharp focus by the recent SARS outbreak and the reason for this is China, the worst affected country by far, Roberts [9]. The concern centers around the electronics industry, which depends on high volumes and low cost and the Asia Pacific region accounts for almost 40% of world semiconductor production worth over \$50bn in 2002 but the spread of SARS, which was first recorded in the southern Guangdong province, could conceivably threaten this industry.

McDonald [8] pointed out the sudden epidemic of the SARS respiratory virus has also reminded everyone of the risk involved, not just from disease and disaster, but political convulsion and according to Volume's Dean Montgomery, "it's been a wake-up call for industry and the big investment banks are advising their clients to have an alternative manufacturing base in case China gets a shut down". The executives of electronics companies in China that were severely impacted by SARS considered the transfer of production plants to the USA and Mexico, Hung and Ojo [30].

Proposed contingency plans for Australian supply chains

Literature review indicated that very little work has been done by Australian businesses to plan for possible events of the same magnitude. It is proposed that the following contingency plans are to be considered by Australian businesses:

Incorporate security into corporate strategy

Companies are starting to realize that the threat of terrorism is affecting their ability to operate and successfully carry on their business, Sheffi.[28]. Security should be incorporated into corporate strategy, Shrader and McConnell [31], protecting employees, business and the networks and the flows of goods and information, however, Sheffi and Rice [27], many companies leave risk management and business continuity to security professionals, business continuity planners or insurance professionals. Whilst the threat of terrorism and other risks, consequently, is not only affecting the physical supply chain, but also the organizational dimension of companies, to the point of affecting the whole corporate strategy, Martha and Subbakrishna [26].

Supply Chain Agility

Since September 11, many European and US companies are reconsidering the wisdom of using overseas suppliers and found that offshore suppliers may be less expensive, but require longer lead-time and may be more susceptible to disruptions in the transportation system, Martha and Subbakrishna [26]. Australian companies should have a network of back up suppliers, on the other hand local suppliers may be more expensive, but are closer and therefore able to respond faster. However an agile supply chain incorporating Australian businesses to its global partners can provide real time visibility and the ability to adapt and respond to all events, from terrorist threat to a sudden market opportunity. This can be further strengthened by the sharing of information and the tighter integration of supply chain players.

Flexibility in outsourcing manufacturing operations.

China is a well established and a successful outsourced manufacturing hub for most MNC, however it is proposed that Australia consider India as an alternative-manufacturing hub to minimize its uncertainties and supply chain risks. Literature review has indicated that India has the core competencies to be a successful manufacturing partner in Australia's supply chains. India's burgeoning economy, backed its English speaking tertiary educated young population, will not only increase trade between Australia and the subcontinent but also provide a gateway for companies down under to gain access into its technology and research centres to enhance quality.

Supply Chain visibility

Jorgensen [33], organisations must incorporate executive level visibility into supply chain exposure, sharing insights of suppliers, continuous monitoring of all suppliers, collect forward looking supplier information and develop an infrastructure empowered to act. Sheffi [28] warranted that shipment data visibility allows manufacturers to avoid plant shut down due to part shortages and allows retailers to avoid turning customers away due to unavailability of goods as the problems can be corrected early. Alternatively, a given level of service may require lower safety stocks because of good visibility and appropriate response. In addition the integration of organisations could increase the level of supply chain visibility, however it is an area where future research needs to be carried out.

Langley [3], through much investment and time, organizations are rapidly gaining visibility of inventory within their own enterprise. Although there is substantial amount of effort being put into collaboration by trading partners, visibility across the supply chain is occurring very slowly.

Conclusion and Further research

This paper has addressed the vulnerability and potential uncertainties faced by the Australian supply chain environment in the Asia Pacific region based on the recent events overseas, the dependency on China for its outsourced manufacturing operations, and the lack of visibility. Literature review has revealed very little work has been carried out by Australian companies to minimize uncertainties for its supply chain. The paper proposes that Australian business, in order to minimize risks, choose India as its alternative offshore manufacturing hub, incorporate security into its corporate strategy, establish back up local parts providers with the aim of minimizing supply chain risks, and increase the level of supply chain visibility. Whilst SCQM can provide the technical solutions to effectively manage visibility across the supply chain,

organizations must be willing to share information in order that uncertainties are minimized. Further research in the integration of organizations is required with a view to share sensitive data.

References

References are available on request