



SUPPLY CHAIN RISK MANAGEMENT IN THE ASPECT OF GLOBALIZATION

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Abstract:

W artykule zdefiniowano pojęcia łańcucha dostaw i zarządzania łańcuchem dostaw. Wskazano czynniki wpływające na ewolucję zarządzania łańcuchami dostaw ze szczególnym uwzględnieniem czynnika ryzyka. Przybliżono najnowsze ujęcie zarządzania łańcuchem dostaw – SCRM (Supply Chain Risk Management) zarządzanie ryzykiem w łańcuchu dostaw. Wymieniono również czynniki powodujące wzrost wrażliwości współczesnych łańcuchów dostaw i szczegółowo omówiono jeden z nich – globalizację. Pojęcie globalizacji rozpatrzono w dwu aspektach – globalizacji łańcuchów dostaw i globalizacji ryzyk.

The APICS² dictionary defines the term *supply chain* as “*the processes from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies*” or as “*the functions inside and outside a company that enable the value chain to make products and provide services to the customer*”. [Reeds: 2]

Traditionally, firms view themselves as having customers and suppliers. A firm did not consider the potential for either its supplier or its customer come to be a partner. Beginning in the 1960s firms began to view themselves as closely linked functions whose joint purpose was to serve their customers. Firms integrated their purchasing, operations and distribution functions to improve customer services while lowering their operating costs. In the 1980s, as it became clear that leading companies in this integration were able to increase their profits, more firms began to adopt *supply chain management* practices.

The difficulty with terms: *supply chain* and *supply chain management* (SCM) is that there are a numerous definitions, most of them rather choose to focus on particular perspectives or attributes. Each of these perspectives is mutually compatible, providing different insights into the same set of issues, often suggesting differing solutions which in themselves may not necessarily be incompatible. [Brindley: 5] Presently, at least three perspectives on SCM focus exist:

- SCM as the management of the internal supply chain,
- SCM as supplier-focused and
- SCM as the management of a network of enterprises, which includes the customer as well as suppliers. This integrative view of SCM has its focus on the virtual and global nature of business relationships. The drivers of this perspective emphasize the

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horizontal integration of business processes and outsourcing of non-strategically critical functions and processes.

The APICS Education and Research Foundation (E&R) has sponsored recent conferences where both academicians and practitioners working together. They have offered more holistic views of SCM and they have summarized four SCM challenges not previously widely considered [Reeds: 4]:

- SCM requires a competitive infrastructure,
- the world-wide global logistics network must be leveraged,
- supply and demand must be synchronized and
- performance of all supply chain partners must be measured globally.

Supply chains are clearly changing but the question is: What are the drivers causing the changes? The most important are enumerating by Waters [Waters: 55-56]: recognition that logistics is an essential function that needs careful management; recognition that decisions about the supply chain have a strategic impact on the organization; realization that logistics is expansive and gives opportunities for substantial savings; emphasis on customer satisfaction and its dependence on logistics; new operations with different demands on the supply chain - such as virtual organizations, just-in-time, agility, mass customization, lean operations, time compression, etc; globalization and growing international trade, encouraged by free trade areas such as the European Union, the North American Free Trade Area and the Association of South East Asian Nations; improved communications, particularly through e-business; other technology, including vehicle telematics, intermodal systems, tracking systems, automated handling, etc; increasing competition, with distant suppliers competing directly with local ones; integration of activities in the supply chain, with the growth of a few dominant members; organizations focusing on core activities and outsourcing logistics to third parties; growing concern about environmental damage, and changing attitudes towards pollution, waste, traffic congestion, road building, etc; changing government policies on the ownership, regulation, use, responsibilities and cost of transport.

SCM is evolving quickly, with managers under continuing pressure to find better ways of organizing their logistics. These improvements are changing both the activities that are done in logistics and the way that they are done. Managers generally aim at lower costs (with leanness corresponding to a strategy of cost reduction) or better customer service (with agility corresponding to a strategy of product differentiation), but recent events have placed a spotlight on the uncertainty of global supply markets and the fragility of supply chains. There is a number of trends that tend to make supply chain more vulnerable, because of natural disasters (for example Hurricane Katrina on the Gulf Coast), terrorist attacks such as terrorist attacks in London, rapid consumer demand changes, shorter product lives and in many other aspects a more complex and vulnerable society than before. For example in 2000, Ford Motor Company had to recall over 13 million Firestone tires at a cost of \$3 billion after learning that design and quality glitches were putting certain tire models at risk of shedding their treads. Similarly, Coca Cola was forced to recall 15 million cans and bottles of its beverages in key European markets after several consumers became ill. The problem was traced to contaminated chemicals used at a specific Belgian bottling plant that failed to inspect or monitor the quality of the incoming chemicals used in its products. The incident cost Coca-Cola \$60 million in lost sales. [Aberdeen Group: 10] The Foot and Mouth Disease in the UK in 2001 impacted agricultural industry more than its last outbreak 25 years ago, because former local and regional supply chains had become international and that the industry was

much more consolidated. Also, many other industries were impacted: luxury car manufacturers e.g. Volvo and Jaguar had to stop deliveries due to lack of high quality leather. [Brindley: 17]³

This means that for both internal and external reasons supply chains and individual links in these chains tend to be more exposed to risks. A survey by the Aberdeen Group found that more than 80 per cent of companies had experienced supply disruption in the preceding two years and almost the same proportion expected risks to supplies to increase over the next three years. There are many reasons for this, but we cannot escape the underlying notion that current trends in logistics are inadvertently increasing levels of risk. [Waters: 55]

During last several years we had to deal with changes in business circumstances which significantly influenced also our approach to risk management. For many years being a matter of interest mainly for financial and insurance analysts, nowadays risk management becomes above all a domain of strategic management experts. Risk – taken not only as strategic issue, but also present in current operational decisions - in a specific way impacts on functioning of logistic structures of both – single enterprise and global supply chains as well. Fundamental contribution to this fact make also logistic practices from lean management (low cost countries sourcing, just-in-time, single-sourcing, outsourcing etc.). They bring not only evident process and cost profits, but also considerable increase in business threats. Waters defines *risk management* as “*the process for systematically identifying, analyzing and responding to risks throughout an organization*”. Nowadays, we could indicate some key developments which enhance the case for increased attention to management of risk in supply chain, one of them (above lean management) is increased exposure to global competitive pressures means that most business organizations are exposed to new and additional risks that may impact more rapidly and with more severe consequences than previously. This lead to appear a fairly new area *supply chain risk management* (SCRM) which can be defined as “*the management of external risks and supply chain risks through a coordinated approach among the supply chain members to reduce the supply chain vulnerability as a whole*”. The objectives of SCRM are [SCV Final Report: 38]: to maintain the supply and continuous availability of product; to decrease the supply chain’s ability to cope with disruptions in the supply of products if necessary; to avoid possible domino effects throughout the chain; to make the supply chain more resilient to disruptions.

Jüttner found that the factors likely to increase supply chain vulnerability are globalization (reported by 52 per cent of managers), reducing stock levels (51 per cent), smaller supply base (38 per cent) and outsourcing (30 per cent). [Jüttner: 122] One of these factors is considered below in more detail – the globalization.

Factors that encourage global operations include [Waters: 68]: *lower costs* – from moving operations to cheaper locations, such as manufacturing in China and call centers in India; *economies of scale* – the optimal size of manufacturing, say, is often larger than demand in single market; *risk reduction* – by moving to safer locations (i.e. those that are remote from identified risks); *availability of skills and knowledge* – that are scarce in one market but readily available in another; *closeness of raw materials* – with operations close to original suppliers; *removal of trade barriers* – particularly in free trade areas, such as the European Union, the North American Free Trade Area and the Association of South East Asian Nations; *growing demand in new markets* – particularly developing regions that are

³ More examples you can find in the book: Brindley, C., *Supply Chain Risk*, Ashgate 2004, p. 17.

becoming increasingly prosperous; *increasing knowledge of consumers* – that are familiar with products from outside their immediate region; *more demanding customers* – aware that local suppliers may not be able to meet their needs, and willing to look further afield for better sources; *convergence of market demands* – with different markets increasingly accepting the same products with minor differences; *improved communications* – linking business around the world as easily as those in the next town; *efficient logistics* – with tools such as containerization, satellite tracking and intermodal transport; *growth of support services* – that can be supplied by firms remote from the host country; *cross-border mergers and acquisitions* – with new operations spread over many countries.

Global operations bring obvious benefits, but there are also risks. Now, through off-shore sourcing, manufacturing and assembly, supply chains extend from one side of the globe to the other. For example, components may be sourced in Taiwan, sub-assembled in Singapore with final assembly in the USA for sale in world markets. Often the motivation for off-shore sourcing and manufacturing is cost. However, that definition of cost is typically limited to the cost of purchase or manufacture. Only rarely are total supply chain costs considered. The result of these cost-based decisions is often higher levels of risk as a result of extended lead-times, greater buffer stocks and potentially higher levels of obsolescence – particularly in short life-cycle markets. A further impetus to the globalization of supply chains has come from the greater increase in cross-border mergers and acquisitions that we have witnessed over the last decade or so. [SCV Final Report: 22] Lean supply chains reduce inventory costs but are susceptible to such shocks as natural disasters or global pandemics; technologies that enable sophisticated pricing improve supply chain efficiency but leave some customers crying foul; and outsourcing creates global winners and losers as shifting jobs leave some without work. [Johnson: 191]⁴ Increasingly global operations mean that a problem in one part of the world can seriously disrupt business in other areas. [Waters: 69]

Three obvious sources of risk with globalisation are [Waters: 70]:

1. Risks from working in a region that is less familiar and more distant from the organization's usual operations. These include reduced control over remote sites, cultural differences, variable levels of skills, language problems, legal systems, political instability, unstable economic conditions, changing costs, rapidly changing conditions different levels of commitment to quality, and so on.
2. Risks of moving materials through longer supply chains. These include the inherent risks of extended journeys, crossing international borders, meeting different cultures, extended lead times, more stock in transit, more handling, the need for bigger order quantities, greater chance of loss, obsolescence of products with shorter life cycles, and so on.
3. Unexpected barriers to trade, such as:
 - product design limiting demand, with different regions demanding different types of product, a product not lending itself to global operations, or customers simply not linking products;
 - practical difficulties making it impossible to meet demand – such as protectionist government policies, problems at national frontiers, inadequate infrastructure, missing technical skills, or other cultural and economic differences.

⁴ The risks of Prevailing Supply Chain Best Practices (low cost countries supply, outsourcing, lean and JIT, vendor managed inventories and integrated supply, supply base rationalization) are widely described in *The Supply Risk Management Benchmark Report*, Aberdeen Group, 2005, p. 4.

All companies and governments dependent on external suppliers are exposed to the risks of disruption in their supply chain. But the extent and complexity of current global supply chains mean that the problem of SCM is not limited to a single enterprise or industry, even a relatively small supply chain disruption caused by a global risk event may ultimately have consequences across the global economic system. [Global Risks 2008: 6] For example in September 1999, global semiconductor prices nearly doubled following an earthquake in Taiwan, China, a key centre for supply. Supply chains frequently appear to disperse risk between multiple parties, but they can also, as in this case, lead to an unrecognized aggregation of risk. [Global Risks 2008: 15-16]

Interdependency implies that we are all vulnerable to disruptions in the global flow of people, capital and technology. But there are at least two additional elements to the globalization of risk which may broaden our understanding of the mechanics of interconnectedness in the global risk environment.

The first is risk *squeezing* - the transfer of negative externalities of a production process, such as environmental and human costs, from one area to another. Supply chains have become more complex and the full exploitation of differences in comparative advantage has unlocked global economic growth. One result has been a delocalization of risk. Even as primary risks in production are reduced in one location, those risks may be *squeezed* to new centers of production where costs, standards and conditions are lower. Some of the effects of risk *squeezing* may remain in geographies of production, posing an ethical dilemma at the heart of globalization. But other effects of risk *squeezing* may have wider global consequences. The transfer of risk may, in any case, be an illusion if the negative externalities affect the global system as a whole, or if other costs may be re-imported in other forms. One clear example of this is in environmental matters. Improving environmental regulation may reduce environmental costs in the near term, but if regulation pushes production to a less-regulated geography which is less equipped to deal with its consequences, then the aggregate long-term impacts may be worse. While air and water quality have improved drastically in recent decades in developed countries, quality elsewhere has been declining – calling into question the long-term, risk-adjusted sustainability of economic growth. Moreover, some of these problems are easily exported. A toxic spill in a river from a factory in China could pollute agriculture through irrigation, enter into the production of goods for global export, and even threaten the water supply of a major Russian city. Environmental degradation may ultimately lead to political unrest, both locally and across borders. Second, as semi-finished or finished products are exported, the effects of risk squeezing may be felt in less obvious and less controllable ways, with major consequences in importing countries. In 2007, the discovery of toxic chemicals in children's toys, made in China for an American brand name, made consumers aware of health risks in imported products which they had previously not considered. The companies involved suffered both a reputational hit and major economic losses. Third, the perception of lack of transparency in production processes and supply chains may undermine popular support for globalization. The argument for consumer protection can lead to outright economic protectionism, going far beyond the genuine risks and beyond the original product or geographic source of risk. [Global Risks 2008: 15-16]

The second is risk *homogeneity*. One example of this is in health risks. Just as globalization has increased the commonality of habits and lifestyles, so has it raised the homogeneity of the risks associated with those lifestyles. Chronic diseases, such as heart disease, cancer and diabetes, traditionally considered to be problems of the developed world, are becoming common in developing countries. The negative habit is the increased use and

consumption of tobacco, alcohol and unhealthy foods. Companies confronted with taxes and regulations against these products in the developed world now target new consumers in the developing world. Finally, global travel patterns have made the risk of a pandemic homogenous across the world. One consequence of this growing risk homogeneity is that the case for common and coordinated global mitigation action has strengthened. [Global Risks 2008: 15-16]

Boyson states that we are currently moving into the third era of global supply chain transformation. The first era was the era of vertical integration, best exemplified by The Ford Motor Company, which was perhaps the first truly global industrial corporation. The second era has been the era of virtualization. For example Sun Microsystems never touches 90 per cent of the server computers it sells globally; rather outsourced Sun supplier base receives Sun customer order signals directly and ships orders to the global customer base via outsourced third-party logistics companies. Information technology and outsourcing have enabled the pooling of assets and capabilities into multi-enterprise virtual networks. The third era is the era of revitalized command. The emerging emphasis is on corporate risk management. Enterprises are re-calibrating their globalisation strategies and strengthening the core of their organizations as the risks of the over-extended and over-outsourced enterprise have come into sharper focus. Executives today are struggling to internalize the lessons of the present era, an era characterized by the disruptions of Y2K, 9/11, severe acute respiratory syndrome (SARS), the Asian tsunami, Hurricane Katrina and soaring gas prices. The multinational enterprise is becoming more risk-averse and less likely to over-extend itself through alliances, and is showing an emerging bias toward more direct absorption and control over assets in its network. [Boyson: 2]

Although managers are giving more attention to SCRM, we know that the implementation of risk management in supply chains is still in its “infancy”. [Christopher et al, 2002]

SCRM is at an early stage of development, and when managers try to improve operational efficiency they rarely consider all of the risks. Typically they focus on some of the more obvious risks, but they do not take a balanced view of them all. The risks associated with them cannot be eliminated. But they can be better understood and better managed. It is therefore reasonable to believe that in the future there will be an increasing interest in SCRM issues as a partial application and as a research area, especially in the aspect of globalization.

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