



# Strategic Supply Chain Management

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/ **Msc. SCM**

/ [www.temagroningen.nl](http://www.temagroningen.nl)

/ [board@temagroningen.nl](mailto:board@temagroningen.nl)

/ [www.temagroningen.nl](http://www.temagroningen.nl) / [board@temagroningen.nl](mailto:board@temagroningen.nl)

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## Lecture 1: Strategic SCM

### **Ketchen & Hult (2007)**

Traditionally, supply chain management has been viewed predominantly as a process for moving materials and goods. In this view, supply chain management is seen as a support function that helps organizations implement their strategies.

- / **Best value supply chains** have their focus on strategic supply chain management – the use of a supply chain not merely as a means to get products to where they need to be, but also as a means to enhance key outcomes that drives a firm's performance.

In best value supply chain management, the emphasis is on matching the chain's approach to each problem to the nature of the problem that needs to be solved. Best value supply chains distinguish themselves by how they approach issues of agility, adaptability, and alignment and by their ability to pursue multiple priorities, the effectiveness of strategic supply chain management is closely tied to three attributes: agility, adaptability, and alignment.

- / **Agility** is the ability of a supply chain to react quickly to unexpected or rapid shifts in supply chain and demand. One way to achieve agility is to develop cultural competitiveness, this is the degree to which supply chains are predisposed to detect and fill gaps between what the customer desires and what currently is offered.
- / **Adaptability** is the willingness to reshape supply chains when necessary, without ties to legacy issues or the way the chain has been operated previously. Adaptable supply chains rely on information systems to identify shifts in the market, and then take appropriate actions such as moving facilities, changing suppliers and outsourcing.
- / **Alignment** refers to ensuring that the interests of all participants in a supply chain are consistent. When a chain participants are faced with

taking an action that benefits their firm versus one that benefits the chain, most often they will choose benefiting their firm.

Best value supply chains strive to excel along multiple priorities, often labeled as competitive priorities, these are mentioned below:

1. **Speed** (often 'cycle time') – reflects the time it takes from initiation to completion of a supply chain process. Focus to deliver on time.
2. **Quality** – continually focus on improving their supply chain processes to increase product reliability and customer satisfaction.
3. **Cost** – cost-driven supply chains strive to create customer value by either reducing costs or increasing benefits in the supply chain equation.
4. **Flexibility** – a supply chains responsiveness to the consistent and changing needs of its users. Both supply chain processes and product flexibility.

**Transaction cost economics (TCE)** centers on the 'make or buy' decision, whether a firm should make a product within the confines of its organizational boundaries or purchase it from an outside provider. The overarching goal is to maximize performance by minimizing transaction costs within and between organizations. Transaction costs are the expenses generated by identifying fair market prices, negotiating, and carrying out economic exchange.

→ In traditional supply chains, short-term transaction costs are the overriding concern. This might result in suppliers reducing the quality of its products in order to increase own margins. So, in this context trust between supply chain members is often difficult to establish and maintain. Members of best value supply chains focus on total costs, not just short-term transaction costs, as the basis of make or buy decisions. So, short-term costs are relegated to a secondary role, and members devote their efforts to building long term, trusting relationships that benefit all participants.

**Agency theory** centers on occasions wherein one entity (principal) delegates authority to a second (agent) to act on its behalf. Problems arise in these relationships because agents often behave in ways that benefit them, not principals.

→ In traditional supply chains conflicts of interest may arise because one firm is delegating authority to another. Best value supply chains recognize and account for this tension. Best value supply chains leverage tools such as reward structures and cultural competitiveness to ensure alignment among participants' interests. This removes the temptation to take advantage of other supply chain members.

**Resource dependence theory (RDT)** centers on how some firms become reliant on others for needed inputs such as goods and materials, and how firms can management such relationships.

→ Within traditional supply chains, each member tries to avoid becoming overly dependent on others for fear of being exploited. Best value supply chains recognize that taking advantage of resource dependencies can have unintended and grave consequences. Thus, in best value supply chains, dependencies should be used to create mutual forbearance and trust, not to drive aggressive exploitation of one chain member by another.

**Institutional theory** emphasizes the role of environmental pressures, many of them subtle and evolving, on firm activities.

→ Traditional supply chains tend to rely heavily on industry recipes and best practices to guide supply chain management activities, copying what works for supply chain icons. Best practice use industry recipes and best practices to inform, but not dictate, supply chain management activities.

**Game theory** uses mathematics and hypothetical scenarios to draw conclusions about the likelihood of decisions and actions. Trying to predict others' actions is a key element of game theory.

→ In traditional supply chains members have reason to be suspicious of each other's motives. This might include protective behavior and suboptimal chain performance along key issues such as speed, quality, cost, and flexibility. Within best value supply chains, mutual dependence and trust overcome members' temptation to pursue self-serving behavior.

**Network theory** describes, explains, and predicts relations among linked entities. Strong ties involve firms that are tightly coupled and loose ties involve firms with more tenuous links. Strong ties provide greater reliability for example, and loose ties enhance flexibility.

→ In traditional supply chains, strong and weak ties are formed on a case-by-case basis without much concern for the overall network configuration. Best value supply chains create a blend of strong and weak ties that matches supply chain needs, in order to maximize supply chain performance.

**Social capital theory** recognizes that firms composing supply chains are themselves composed of people, and that the interpersonal skills and relationships among these people shape supply chain activities and outcomes.

→ Within a traditional supply chain, each person has conflicted loyalties between the firm and chain. The resultant mix of shared and firm-level goals, values, and experiences circumscribes shared sensemaking and limits performance. Best value supply chains creates a context wherein shared goals, values, and experiences create shared sensemaking and improved performance.

**Strategic choice theory** contends (stelt) that managers' decisions play a tremendous role in organizational success or failure.

→ Within traditional supply chains, strategic decisions are made with concern for the firm as the primary driver. Within best value supply chains, strategic decisions are made with concern for the chain as the primary driver. Resulting in blended

strategies that transcend the firm and provide the chain with increased agility and adaptability.

**Resource-based view** examines how certain assets and capabilities lay a foundation for competitive advantage and superior performance. Viewing the firm as a bundle of resources.

→ In traditional supply chains unique resources reside within firms. Supply chain management is thus a tool to complement these resources. Best value supply chains reflect the assumption that unique resources exist at the supply chain level, and that supply chains can be inimitable competitive weapons.



### **Mena et al. (2013)**

The trends toward outsourcing and global sourcing have created more complex and fragmented **multi-tier supply chains (MSC)**. The length and complexity of supply chains can have an impact on economic indicators of performance, such as costs, quality, responsiveness and resilience. However, many of the key constructs used to describe and analyze supply chains tend to be grounded on dyadic logic. Critics of the dyadic approach to researching supply chains have argued that focusing on dyads does not capture the complexities of networks.

#### Complexity of Multi-Tier Supply Chain Research

- / Much research into MSCs has relied upon modeling and simulation approaches → example of this is the Beer Game (Sterman)
- / Alternative to modeling and simulation has been the use of organizational, economic and sociological theories
  - o **Transaction Cost Economics** – Focus on selecting the governance structures that minimize transaction costs for a specific firm, but it does not help to explain the dynamics among multiple firms
  - o **Resource Based View** – Is taking predominantly a dyadic perspective. Explain participation in a network so as to extend and complement a firm's internal resources
  - o **Complex Adaptive Systems** – Helps to understand the behaviour of multi party relationships in the supply network context.

#### Structural Arrangements:

- / **Buyer-Supplier-Supplier Relationships** – involves the relationships between a buyer and two suppliers, and between the suppliers.
  - o Parallel sourcing to overcome supply risk
  - o Focal buyer needs to sustain the positive aspects of these relationships through sourcing strategies and proactive management tactics

- / **Supplier-Buyer-Customer Relationships** – Buyer coordinates multiple tiers, common in service outsourcing. A buyer sells the customer a service that is provided by its supplier.
  - o Buyer is the bridge between supplier and customer
  - o Buyer should be aware not to lose all information and control benefits
  - o Buyer should be aware of possible opportunistic behaviour of the seller

### **Case Study Results:**

1. Depending on their position in the supply chain (buyer, supplier, supplier's supplier), the members of the MSC appear to draw power from multiple sources. Buyers can act as bridges between the MSC and the marketplace, suppliers act as a bridge across the MSC and supplier's suppliers have access to resources such as raw materials and expertise.
2. How to manage the sustainability in extended MSCs is becoming an increasingly important topic. The raw materials had a strong impact on sustainability because it is at this stage that the majority of natural resources tend to be consumed. Pagell et al. (2010) pointed out how buyers engaged in sustainable sourcing were looking for closer collaboration with suppliers and suppliers' suppliers.
3. In the conducted case study, it appeared that as the members of the MSC became aware of the interdependent relationships they had with other members of the MSC, and as the triad moved into a closed structure, they relied more on trust and cooperation than on power to achieve their objectives. Commitment and trust are central to the development of supply chain relationships, and a high level of trust will lead to a higher perceived cooperative performance.
4. Fully closed MSCs are more stable, but they require additional management resources and skills. When a network is closed, each

member is in a better position to triangulate the information it receives from its partners and thus is less exposed to opportunism and adversarial behavior. Open MSCs demand fewer management resources, but are less stable. This is because they are more exposed to unilateral actions by any member of the MSC, which could have unexpected consequences on behavior and outcomes.

## Lecture 2: Power and Trust

### Pulles et al (2014)

For firms it is extremely difficult to attain competitive advantage when competitors acquire better resources from a shared supply chain. For example, in the automotive industry high-level knowledge is diffused to competitors through shared suppliers, resulting in losing competitive edge.

- / **Social Exchange Theory (SET)** is driven by the central concept that behavior of a company and resource exchanges in relational exchanges can be explained by relational mechanisms. A social exchange refers to a situation in which the actions of one individual provide the rewards or punishments for the actions of another individual in repeated interactions.

Resources are the *tangible* and *intangible* entities available to the organization that enable it to produce efficiently and/or effectively a market offering that has value for some market segment. Competition is derived from superior resources, so resources can be seen as the axes of competition.

Successful relationships with suppliers can create benefits that extend beyond the actual product and service exchange, and a key determinant of a successful relationship with a supplier is the relationship itself. SET can here be used to explain the behavior of a supplying firm contingent on the relational mechanisms applied by the buying firm.

Power and trust are seen as the two main strategies used by buying firms to influence suppliers:

- / **Power** within a buyer-supplier relationship can be defined as the ability of the buying firm to influence or control the decisions and behavior of the supplying firm.
- / **Trust** exists when a firm has confidence in a partner's reliability and integrity. Trust between firms creates an atmosphere where partners

willingly exceed the minimal requirements of an exchange relationship, based on the belief that the partner will take actions that will result in positive outcomes for the firm.

**Power (more effective when large):**

- / Nonmediated sources of power are not specifically exercised to influence the partner. A firm may not even be aware that these non mediated sources of power exist.
- / Mediated sources of power are used by a firm to control the reinforcements guiding the partner's response.
  - o **Coercive power** stems from a firm's ability to punish the partner if this partner fails to conform to the firm's influence attempt.
  - o **Reward power** depends on the firm's ability to administer positive valances if the partner conforms to the firm's influence attempt.

Successful application of buyer power results in the intended changes in the behavior of the supplier. Consequently, failed attempts may not result in any changes in the supplier's behavior or even in undesirable behaviour.

**Trust (more effective when small):**

- / **Goodwill trust** refers to the degree to which a partner trusts the other to be willing to act in ways that exceed the stipulated contractual agreements without explicitly asking for such help
- / **Competence trust** refers to a firm's expectation of a partner's technical competence or expertise.

Trust is considered to be a crucial element for firms to enter in a relationship and to develop this relationship.

**Results**

- / Coercive power does not significantly affect supplier resource allocation. However, coercive power did have a significant effect on physical resources for buyers accounting for a large share in the supplier's turnover.

- / Reward power was found positively related to supplier allocation of physical and innovation resources.
- / Goodwill trust was found to have no significant effect on supplier resource allocation in the full sample. But in the multigroup analysis it showed a significant relation.
- / Competence trust was found to positively relate to supplier allocation of physical and innovation resources.
- / So both power and trust can be seen as antecedents of firm behavior.
- / Coercive tactics can be effective practices when firms aim for better physical supplier resources and account for a large share in the supplier's turnover.
- / Dependence of a supplier on the buying firm in terms of share in turnover does not affect the effect of the power dimensions as much as it affects the trust dimensions.
- / A high reliance on the buyer's turnover increases the relational risk for suppliers; the need for suppliers to rely on goodwill trust becomes critical then.
- / Buying firms with a relatively small share in turnover would benefit more from building competence trust and buying firms with a relatively large share in turnover would benefit more from building goodwill trust.
- / Coercive tactics could deteriorate the goodwill trust, and reward power could stimulate goodwill trust.

#### **Cox et al (2001)**

A **supply chain** is an extended network of dyadic exchange relationships that must exist for the creation of any product or service that is supplied to a final customer. At each stage in the supply chain, some form of transformational, or intermediation, must occur that adds value to the product or service as perceived by the buyer at that stage and ultimately by the final customer. There are two types of supply chains: manufacturing based and service based.

- / **Manufacturing supply chains** involve the effective linkage of three flows: material, information and money.
- / **Pure service supply chains** generally do not encompass material flow, they only involve the effective linkage of information and money flows. So, the most significant stage in the service supply chain is human competence.
  - o Competence can be used *tacit*, so intuitively held in the head of the individual and uncodified
  - o Or competences can be used *codified*, so written down and capable of being passed on to other through training.

However, it is rare for supply chains to be categorized into simple manufacturing or pure service types. Organizations offer mostly their customers a hybrid of products and services. Fisher has attempted to differentiate between supply chains on the basis of the life cycle of the product.

PRODUCT TYPES	TYPE OF DEMAND	SUPPLY CHAIN STRATEGY	
EXISTING CORPORATE PRODUCTS AND SERVICES	<b>FUNCTIONAL PRODUCTS</b> Regular stable demand, with low profit margins	<b>SUPPLY CHAIN STRUCTURE</b> Functional products Predictable demand Market size known Price sensitivity high	<b>OPERATIONAL FOCUS</b> Efficiency through a focus on minimizing physical costs Competition on price is key
	<b>INNOVATIVE PRODUCTS</b> Unstable and short-life demand, with relatively high profit margins	<b>SUPPLY CHAIN STRUCTURE</b> Innovative products Unpredictable demand Market size not known Price sensitivity less high	<b>OPERATIONAL FOCUS</b> Focus on linking supply chain demand with product availability rather than cost Flexible response to uncertain demand is key

So, according to Fisher there are supply chains that provide *standard products and services*. In these supply chains long-term, lean, and efficient integrated supply chain relationship management approaches are required. On the other

hand, there are supply chains in which the product life cycle changes *rapidly*. Here the key to success is innovation, based on agile and flexible supply relationship management.

Supply chains are complex networks, therefore it is necessary to move from a description of the physical properties of products and services in these chains to a more analytical understanding of the relationship between physical properties and the flow of value that occurs in the chain. **Value** is used in three broad ways:

- / Value used to refer to the utility that the customer derives from the product or service acquired (**value proposition**);
- / Value used to refer to the transformation process that takes place within organizations as they take less valuable supply inputs and turn them into more valuable supply outputs (**value adding process**);
- / Value used in relation to the amount of money that is retained by any organization from participating at a particular stage in the supply chain (**value appropriation**).

Value propositions enables organization to think about the wants and needs of customers. The value adding process helps an organization to make distinct and unique products and services. The value appropriation allows the organizations to think about whether what it does provides it with an acceptable return on its capital employed. To be properly analytical, supply chain thinking must encompass not only the description of what is done to add value to supply inputs, in order to meet customer value propositions, it must also understand and explain how value is appropriated, and by whom.

Only by understanding the properties of power in extended dyadic exchange scenarios a properly analytical and prescriptive approach to supplier and supply management can be achieved.

- / In certain power regimes, the buyer and/or supplier is in a position to block the passing of value from upstream to downstream end of the chain. Here,



it is unlikely that proactive attempts to develop suppliers and pass value to end customers will be successful.

- / Integrated supply chain management may only be possible in circumstances in which either buyers and suppliers are interdependent, or because a buyer is the focal organization in the chain and it can impose buyer dominance throughout the chain.
- / Often the requisite level of coordination cannot be achieved because supply chains are characterized by power regimes that are hostile to an uninterrupted flow of value from raw material providers to end customers.
- / If power regimes have complex properties then one approach to relationship management is unlikely to be appropriate for managing effectively within that power regime as a whole.

#### **Krause et al. (2007)**

There is growing recognition of the importance of *inter-organizational relationships* as a source of competitive advantage and value creation. When organizations invest in relation-specific assets, engage in knowledge exchange, and combine resources through governance mechanisms, a supernormal profit can be derived on the part of both exchange parties.

→ *This study is based on the social capital theory*

**Supplier development** is any activity initiated by a buying organization to improve the performance of its suppliers. Supplier development is an important strategy for examination because it encapsulates two of the most evident features of social capital: shared knowledge and shared asset investments.

According to the **relational view**, investments are made by buyers in the development of suppliers in order to accrue intangible benefits such as reduced cost, greater quality and flexibility, and more reliable delivery. In return, the supplier firm may be expected to share information, dedicate human resources to the improvement effort, and invest in specific equipment.

Buying firms in manufacturing industries have four primary competitive priorities in their end-markets: cost, quality, delivery time + reliability, and flexibility. Manufacturing industries rely heavily on component suppliers, so the performance outcomes of buyers are largely dependent on the performance outcomes of their suppliers.

- / *Cost and total cost* – improvements in the cost of products for buying firms are dependent partially on improvements by their subcomponent supplier. As suppliers reduce their costs, the benefits should be at least partially transferred to their industrial customers in the form of lower prices.
- / *Quality* – quality inputs from some suppliers are still problematic, and the quality of component parts affects customers' perceptions of quality in the final product. Design-for-manufacturing and Six Sigma are commonly used methods for improving quality.
- / *Delivery* – delivery performance consist of two components, first the reliability of delivery, which is the ability to deliver when promised. Second is the delivery speed, which is typically though of in terms of short delivery times.
- / *Manufacturing flexibility* – flexibility is required to respond to unpredictable environments. Buying firms want to be more flexible in responding to variations in end customer demand. So, suppliers must be able to meet changes in quantity requirements, provide timely delivery of products on short notice, and produce smaller productions runs at more frequent intervals.

Performance improvements sought by buying firms are often only possible when they commit to long-term relationships with key suppliers. When buying firms signal a commitment to a long-term relationship and indicate a willingness to make investments in key suppliers to help them improve performance, buyer performance would also be expected to improve.

There are three dimensions of social capital:

- / **Structural** – related to social capital resulting from the structural configuration, diversity, centrality and boundary spanning roles of network participants. Structural capital investments and accumulations can be expected to improve buyer performance. More personal forms of communication that entail the transfer of tacit knowledge will be more positively related to buyer improvements in quality, delivery and flexibility than simple information sharing or supplier evaluation. However, basic information sharing is more positively related to improvements in buyer costs.
- / **Cognitive** – refers to the resources that provide parties with shared representations, interpretations, and systems of meaning. Goals are shared when members of a network share a common understanding and approach to achievement of network tasks and outcomes. If goals are shared, buyers and suppliers can be expected to have a shared understanding of what constitutes improvement and how to accomplish it, leading to greater improvement in cost, quality, delivery and flexibility.
  - o If goals and values are incongruent, interactions between the two parties can be expected to lead to misinterpretation of events and conflict. Here, both parties can become dissatisfied, limiting information sharing, resulting in negative effects on productivity and performance.
- / **Relational** – refers to personal relationships that develop through a history of interactions. Researchers have argued that trust tends to increase with the length of the relationship between buyers and suppliers. Furthermore, a prior history of cooperation between firms has been found to reduce their expectations of opportunism and decrease their perceptions of exchange hazards. So, the longer the length of buying firm's' relationships with key suppliers, the larger the buyers' performance improvements. And the more

dependent on the relationship of buyer and supplier, the better buyers' performance improvements.

### Lecture 3: Supply Chain Risk

#### Lee (2004): Triple A

Top performing supply chains possess three very different qualities:

1. **Agility** – react speedily to sudden changes in demand or supply
2. They **adapt** over time as market structures and strategies evolve
3. They **align** the interests of all the firms in the supply chain network so that companies optimize the chain's performance when they maximize their interests

All these three factors should be in place to be successful, missing one of the three factors can result in failure. However, high speed, low-cost supply chains are unable to respond to unexpected changes in demand or supply. Many companies have centralized manufacturing and distribution facilities to generate scale economies, and they deliver only container loads of products to customers to minimize transportation time, freight costs and the number of deliveries.

Companies' obsession with speed and costs also causes supply chains to break down during the launch of new products. E.g. vendors being so busy ramping production up and down that they hadn't found time to fix bugs in both the components' manufacturing and the product's assembly processes. So if the company had given suppliers a steady, higher than needed manufacturing schedule until both the line and demand had stabilized, it would have initially had higher inventory costs, but then the product would still be around.

Efficient supply chains often become uncompetitive because they don't adapt to changes in the structures of markets. Supply chain efficiency is necessary, but it isn't enough to ensure that firms will do better than their rivals. Only those

companies that build agile, adaptable, and aligned supply chains get ahead of the competition.

### **Agility**

Agility is critical because in most industries, both demand and supply fluctuate more rapidly and widely than they used to. Therefore, being agile is important. Methods to do so are: promote flow of information with suppliers and customers, develop collaborative relationships with suppliers, design for postponement, build inventory buffers of inexpensive but key components, have a dependable logistics systems and develop crisis management teams.

- lack of an agile supply chain can result in losing market share (products staying too long in the pipeline, not being able to be an early adopter, higher WIP)
- Zara is a very agile company
- Agility has become more critical the past few years due to globalization, more vulnerable for sudden shocks to supply chains
- Fire in Philips facility, Nokia was agile, Ericsson was not and lost market share

### **Adaptability**

Adaptability is to adjust supply chain's design to meet structural shifts in markets; modify supply network to strategies, products, and technologies. Methods to do so are: monitor economies all over the world to spot new supply bases and markets, use intermediaries to develop fresh suppliers and logistics infrastructure, evaluate needs of ultimate consumers (not just immediate customers, create flexible product designs, and determine where companies' products stand in terms of technology cycles and product life cycles.

- ✓ Most companies don't realize that in addition to unexpected changes in supply and demand, supply chains also face near-permanent changes in markets. Unless companies adapt their supply chains, they won't stay competitive for very long.

- / The best supply chains identify structural shifts, sometimes before they occur, by capturing the latest data, filtering out noise, and tracking key patterns.
- / Smart companies tailor supply chains to the nature of markets for products. They usually end up with more than one supply chain, which can be expensive, but they also get the best manufacturing and distribution capabilities for each offering.

### **Alignment**

Alignment is creating incentives for better performance. Methods to do so are: exchange information and knowledge freely with vendors and customers, lay down roles, tasks, and responsibilities clearly for suppliers and customers, and equitably share risks, costs, and gains of improvement initiatives.

- / If any company's interests differ from those of the other organizations in the supply chain, its actions will not maximize the chain's performance.
- / A method to improve alignment in the supply chain is vendor-managed inventory, it enables to track the consumption of components and reduce transportation costs

→ In 2001 Cisco failed to align with its contract manufacturers resulting in writing off 2,25 billion dollars of inventory.

### **Christopher & Lee (2004)**

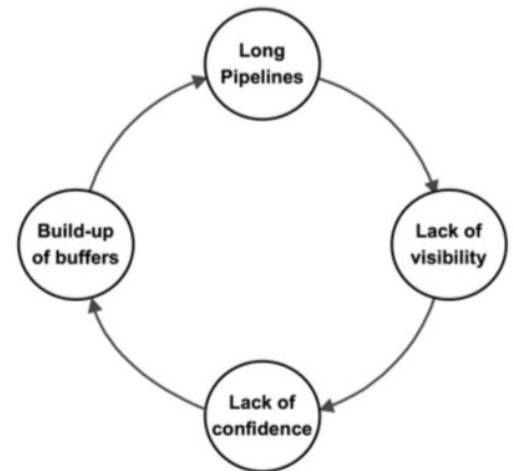
There are certain forms of **risks** within the supply chain:

- / **Financial risk** – inventory costs due to obsolescence, markdowns and stock-outs can be significant. Furthermore, risk of reworking stock and penalties for non-delivery of goods.
- / **Complexity and uncertainty of supply chains** – can result in chaos effects such as over-reactions, unnecessary interventions, second guessing, mistrust, and distorted information through a supply chain. Makes it hard to make optimal decisions at each stage in the supply chain. E.g. bullwhip effect.
- / **Unexpected and unpredictable disruptions** – e.g. terrorism, strikes etc.

✓ **Market risks** – missing market opportunities that may exist.

A supply chain with high risk exposure cannot be efficient. A manager running a supply chain with these risks lacks confidence in the supply chain.

**The risk spiral** – e.g. if a sales team believes that order cycle and order fulfilment times are not reliable, they will devise their own means of addressing this. They may order stock so as to have supplies to support their key customers and put in phantom orders to secure supply, all causing inefficiencies.



→ Without supply chain confidence, entities within the supply chain are liable to chaos and decision risks and the acceleration and expansion of the risk spiral. Visibility and control can reduce the lack of confidence.

Long pipelines weakens the confidence in a supply chain. The increased globalisation of supply chains and the prevalent use of sub-contract manufacturing and offshore sourcing can contribute to the length of time it takes to complete all the needed steps in the process. Another disturbing factor is visibility within the pipeline. Shared information among supply chain members can improve the visibility.

Furthermore, supply chain confidence requires the ability to take control of supply chain operations. Even if a supply chain manager has visibility of some part of the pipeline, he/she often could not make changes in a short time.

Without *visibility and control*, it is common that the supply chain is plagued with buffer inventories. Buffering is often used to hedge against uncertainties and

risks in the supply chain, leading to high costs. Another way that is often used is investing in excessive capacity.

*Lack of confidence* makes it difficult to be responsive to customers, to react to changes in market conditions, and to be competitive in providing customer service. Lead times quoted to customers tend to be longer, since added protection is needed when the sales representative does not have confidence in the supply chain. Special request may be turned down and flexibility may be limited to protect, but this is not a competitive method.

- / Another concern is the risk of a sudden downturn in demand while inventory levels are high through excessive buffering → Cisco example (write off 2 billion)

With excessive buffer inventories and capacity throughout a supply chain, as well as long pipelines from end to end, the information pertaining to the status and problems within the supply chain is also less available meaning that prompt actions to respond to irregularities or unexpected events are less feasible. Thus, lack of supply chain confidence creates excessive supply chain risks.

**Supply chain confidence** reflects the perception of performance reliability at each step in the chain. E.g. the higher the confidence, the greater will be the willingness to reduce safety stock. To restore supply chain confidence we must address the two basic elements: visibility and control.

- / **Information accuracy, visibility and accessibility** – all essential information should be accurate and timely, and accessible by key members of the supply chain. Accuracy of data should be a source of confidence to the parties using the data.
- / **Alerts for out of control conditions** – when deviations from the plan occur, the appropriate parties in the supply chain have to be alerted.



- / **Responsive corrective actions** - provide members of the supply chain with contingency plans and the tools to make corrective actions when out of control conditions have been detected.

Once information can flow across the supply chain, then we are only a short step away from a dramatic reduction in total system inventory while simultaneously improving responsiveness to demand. The ability to match supply more closely with demand we call agility and the key to agility is speed. It implies synchronisation from one end of the pipeline to the other, so all players in the supply chain are marching in step, at the same drum beat.

- Synchronous supply requires transparency of demand and pipeline inventory in as close to real time as possible.
- Zara is a good example, through transparency of information they can maintain a high degree of agility and confidence.

## Lecture 4: Sustainability

### **Lee (2010): Don't tweak your supply chain**

Firms often take a piecemeal approach to sustainability. They demand that suppliers replace materials with greener ones, and they tweak their own operations with recycling, energy-efficient equipment, and the like. Although these changes often seem worthwhile individually, they may in the grand scheme generate unintended consequences, such as higher financial, social, or environmental costs. Companies should pursue broader structural change instead. This means identifying opportunities that span the supply chain, reinventing manufacturing processes, and even linking up with competitors to tackle challenges of scale. The result can be a greener supply chain that requires less capital, has much lower operating costs, and provides a competitive advantage.

- / Esqual for example changed its supplier-customer relationships with independent farmers in China to be more like partnerships.

The only way companies can recognize and navigate trade-offs or conflicts in their supply chain is to treat sustainability as integral to operations.

- / Example: when working with suppliers to improve their operational performance, Nike also trains them to boost their environmental and social performance.

To do this at your company, start by mapping internal supply chain operations. Identify where environmental and social-responsibility problems or opportunities lie. Evaluate alternative ways to make improvements that may require trade-offs between the two types of performance.

Often, an internal operation can achieve only limited sustainability improvements on its own. Its adoption of a new material, component, or technology may require changes in adjacent units. Start coordinating efforts by identifying all the overlapping activities. Then, working with other parties, explore improvements

you could make together that would transcend what any of you could achieve on your own.

- / After you've sought opportunities with adjacent internal operations and direct customers and suppliers, don't stop. Turn your attention to your suppliers' suppliers and your customers' customers, the extended supply chain. Once you have identified the vulnerabilities in your extended supply chain, you can collaborate with members to make improvements.

To make major structural changes, parties must *align their incentives*. This may involve altering payment schemes or using other types of incentives so that all partners believe they will benefit from the collaboration. Such alignment is the key to the sustainability of the sustainability initiatives.

- / With a training program for suppliers, Starbucks created incentives that have helped the company lock in high-quality suppliers that are environmentally and socially responsible. With less supplier churn, it has managed to lower its long term procurement costs and reduce its supply chain risk.

Sometimes sustainability challenges are too great for the supply chain of any one enterprise to tackle on its own. Take recycling. A single company may not have the scale to support efficient collection and processing. If that is the case, the best solution is to work with other supply chains, even those of competitors.

Thus, *sustainability has become a competitive concern* and should be handled accordingly. The core managers overseeing the supply chain must own and tackle it as aggressively as they do cost, quality, speed and dependability. They must engage the entire supply chain as they seek breakthroughs and try to minimize risks. Companies that take such a holistic approach will steal a march on reactive competitors.

### **Matthews et al. (2016)**

The introduction of the triple bottom line into SCM marked a paradigm shift within the field and facilitated the organization of **sustainable SCM (SSCM)** into a meaningful research program. A dominant assumption within SSCM literature appears to be that economic, environmental, and social sustainability can be achieved simultaneously. However, on the other hand it has long been recognized within the economics literature that sustainability will require painful trade-offs, and trade-offs are emerging as a theme within the management literature on sustainability.

The authors developed an alternative framework for mapping sustainable paradigms, consisting of two dimensions:

1. **Sustainability Dimension:** There is consensus that we have exceeded the ecological capacity of our planet and are faced with tremendous social challenges as a result, there is considerably less agreement about how these problems should be addressed. Here sustainability is defined as the ability to maintain at least a non declining stock of capital for future generations. Weak sustainability assumes that growth in manufactured capital is allowed if its value is greater than the value of any natural capital consumed in the process (most theorists will reject this view). Strong sustainability views natural capital and manufactured capital as complements, meaning that beyond a certain scale of economic activity, it is unsustainable to destroy natural capital to create manufactured capital.
2. **Change Dimension:** This concerns the relationship between structure and action that is central to the process of change. Determines the possibilities for change. Humanist (agency) theories tend to emphasize the ontological priority of action over structures and believe that agents have a high degree of autonomy. Structuralist theories either tend to believe that agents have little autonomy or give little weight to the question of agency.

The combination of the two dimensions yields four sustainability paradigms. A paradigm defines what problems are legitimate for a community of researchers and theorists.

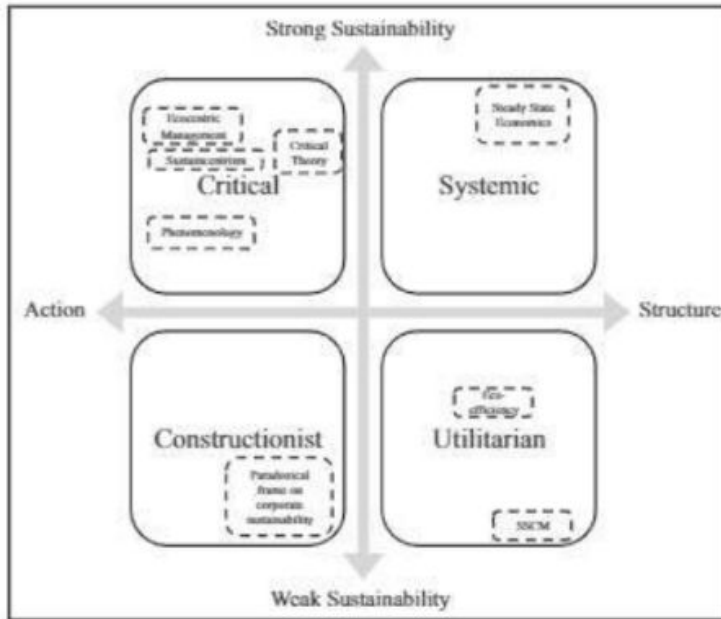
**Utilitarian Paradigm** (*weak sustainability + structure*): a typical problem within the paradigm is how to decouple manufactured and natural capital through radical increases in resource productivity. For this perspective the most serious problem with SSCM is that it is not currently able to show how SCM is able to deliver reductions in environmental impact.

**Systemic Paradigm** (*strong sustainability + structure*): theories in this paradigm view the unsustainable society as being inherently unstable. A typical problem for this paradigm is to determine the optimum scale of economic activity in terms of energy and material throughput. The inability of SSCM theory to capture the relationship between SCM and the protection of natural capital is more serious than from the utilitarian perspective.

**Constructionist Paradigm** (*weak sustainability + agency*): concerned with how supply chain stakeholders make sense of sustainability. A typical problem here might be how practitioners working toward sustainability will need to cope with multiple and conflicting goals, internal conflicts, and the cognitive and emotional distress this may cause. However, the picture of sustainability produced by SSCM to date from this perspective seems insufficiently rich. Little is known about what affected stakeholders actually think, how they react, and what they feel.

**Critical Paradigm** (*strong sustainability + agency*): theory in this paradigm is highly normative and is trying to get ahead of practice. Focus on many of the same structural contradictions as those theorists working in the *systemic paradigm*, but are more concerned with how consciousness shapes, and is shaped by, those contradictions.

### The Four Paradigms of Sustainability



## Lecture 5: Competitive Dynamics

### Capron & Chatain (2008)

Although competition in factor markets or political markets is a central consideration in a firm's strategy, the idea of exerting power in a resource environment and attacking rivals' resources has not been fully articulated in the existing literature. Resource Based View scholars have made great advances in understanding how a firm can build a resource position through the development of its own resources, but they have paid relatively little attention to the firm's relationships with its external resource environment and its actions on competitors' resources.

- / **Competitive advantage** derives from firm-specific resources that are *scarce and superior* in use, relative to others.

Reducing the quantity of available competing resources directly impairs the competitor's production capacity compared to the demand of their services. Decreasing the effectiveness of competitors' resources can also hurt their production capacity. Actions that increase rivals' resource costs or impair the effectiveness of their resources reduce the quantity they can profitably produce.

Resources are said to confer an enduring competitive advantage on a firm to the extent that they are valuable, rare, and hard to imitate or substitute.

- / A focal firm can take actions to upgrade its own stock of resources in order to maximize the value offered by its own resources (**Resource-Oriented**).
- / A focal firm can also take actions in its resource environment to degrade the resource position of its rivals in order to widen the gap between the value offered by its own resources and the value offered by its rivals' resources (**Competitors' Resource-Oriented**).

A focal firm can take two kinds of actions to exert control over its competitors' resources:

1. *Reduce the quantity* of resources available to its competitors so that they can no longer serve the same level of demand because of output restriction.
2. *Impair the effectiveness* of its rivals' resources so that they can no longer serve demand with the same level of effectiveness (ability to create value).

A focal firm can intervene in two types of resource environments to attack its rivals' resources:

1. **Factor markets** – are markets where resources that firms need to compete in their product markets are exchanged.
2. **Political markets** – arena in which demanders of policies interact with providers of policies to shape policies that favor the demanders' interests.

→ Political strategy is defined as those activities taken by organizations to acquire, develop and use

power to obtain an advantage in a situation of conflict. Regulations play a very important role in the

process of defining, trading, and allocating resources among firms, thereby influencing the quantity

and effectiveness of resources that competitors can use.

**Target competitors resource position:** scarcity rents are the operating profits earned by a firm controlling superior effective resources that are in short supply compared to demand, thereby constraining the output of the firm, and employee poaching has a direct negative effect on the target rivals' stock of resources.

→ Example of signing up movie stars to prevent other studios from being able to benefit from their talents, customers are willing to pay less for movies without stars.

Intervening political markets – focal firm can decrease the quantity of resources available to its competitors e.g. taxicab medallions, licenses or airport slots. Focal firm can engage in lobbying activities to make its rivals' resources less acceptable



to its clients, customers, shareholders etc., thereby making those depreciated resources more costly to use e.g. tougher standards for landfills for the waste disposal industry

**Increase focal firm's resource position:** Increase the quantity of available resources to the focal firm. In some cases the focal firm prefers to hoard the newly controlled resources and, eventually, in some extreme cases, to destroy them.

- / **Residual demand** represents the part of the total demand that is not served by competitors. In the absence of collusion among competitors, the positive operating profits are scarcity rents that are the result of the combination of the focal firm's low marginal costs, the fixed supply of productive resources, and high residual demand.

**Factor Market Competition:**

- / A focal firm has more opportunities to shape its environment and therefore to intervene in factor markets when the environment is in formation or is undergoing some **discontinuity**. Discontinuities in the environment often give firms opportunities to take actions against their rivals' resources.
- / Traditional analysis in IO considers that competitors are more likely to collude in industries that include a **small number of firms**. The fewer the competitors, the more knowledgeable the focal firm is about the nature of the competitors' resources, their sourcing patterns, and the mechanisms by which their resources can be influenced. The lower the number of competitors, the greater the likelihood that the focal firm will intervene in factor markets in a cost-effective manner. The more firms there are in an industry, the weaker the interdependence among these firms. The increase in residual demand, due to one firm's difficulties, would be split among more competitors. Small number of competitors results in more chance of deploying actions against their competitors' resources.

- / When the resource environment is characterized by the existence of resources with **well-defined property rights**, firms are more likely to deploy actions against their competitors' resources in factor markets. Property-based resources include long-term contracts that monopolize scarce resources, exclusive rights to a valuable technology, and licenses.
  - / When competing firms experience **differential gains** from controlling resources in factor markets, the firm that expects higher gains is more likely to deploy actions against its competitors' resources in factor markets. Differential gains or losses happen when firms have asymmetric expectations about the value of rivals' resources to be controlled. Thus, the firm that benefits most from attacking competitors' resources is more likely to take preemptive or competitive actions in factor markets.
  - / When competing firms experience **differential losses** from *not* controlling resources in factor markets, the firm that expects higher losses is more likely to deploy actions against its competitors' resources in factor markets.
  - / When competing firms have differential capabilities in **scanning their resource environment**, the firm with superior scanning capabilities is more likely to deploy actions against its competitors' resources in factor markets. Firms with a strong ability to scan their external environment are more able to monitor external knowledge, and are therefore more inclined to intervene in factor markets to control threatening resources.
  - / When competing firms have different performance cultures, the firm that has the most **competitor-oriented culture** is more likely to deploy actions against its competitors' resources in factor markets. Competitor-oriented firms are more likely to devote substantial resources to collecting competitor-oriented information and evaluating their performance in market share – rather than absolute profitability – than self-oriented firms.
- **Winner's curse** is a situation where the winning bidder overestimates the value of the resource it has acquired by failing to recognize that its information about the value of the resource may be biased.

### **Political Market Competition:**

- / When the resource environment is in a stage of institutional formation or undergoing some institutional **discontinuity**, firms are more likely to deploy actions against their competitors' resources in political markets. It is harder to influence the political process in a more mature and structured resource environment where norms are established and interests of competitors are entrenched.
- / When the resource environment is characterized by a **small number of politically active** competitors, firms are more likely to deploy actions against their competitors' resources in political markets. In a context of high level of competition, political interventions are less attractive because they are more likely to result in a lack of concrete change in policy.
- / When the resource environment is characterized by a **weak political influence** of consumer groups, firms are more likely to deploy actions against their competitors' resources in political markets for those actions that are detrimental (beneficial) to consumer groups. For those actions that hurt competitors but serve consumers' interests, a focal firm is more likely to deploy actions against its competitors' resources when the targeted consumer group exerts a strong political influence.
- / When competing firms experience **differential gains** from influencing regulation of resources in political markets, the firm that expects *higher* gains is more likely to deploy actions against its competitors' resources in political markets. E.g. a firm that innovates new technologies for reducing pollution should lobby its government to toughen environmental regulations, which will put competitors with less advanced "green technologies" at a resource disadvantage.
- / When competing firms experience **differential losses** from *not* controlling resources through political markets, the firm that expects higher losses is more likely to deploy actions against its competitors' resources in political markets.

- / When the focal firm's competitors widely use similar types of resources that are **different** from those used by the focal firm, the focal firm is more likely to deploy actions against its competitors' resources in political markets. E.g. a green energy firm lobbying for more stringent safety standards in nuclear power generation will affect all firms using this technology.
- / When competing firms have different political connections, the firm that enjoys **superior political connections** is more likely to deploy actions against its competitors' resources in political markets. We expect firms having strong political connections to be more likely to intervene in political markets to shape policy pertaining to their resource environment in their favor. If the management team of a firm has more links with policy makers than its competitors, it should be able to carry a political strategy at a lower cost.
- / When competing firms have different resource endowments, the firm that enjoys **superior resource endowments** is more likely to deploy actions against its competitors' resources in political markets. Governments are more likely to accommodate firms that are more likely to accommodate firms that are technological leaders.

### **Sustainability of Scarcity Rents**

- / The greater the **competitive impact** of the focal firm's actions on its competitors' resources, the *less sustainable* the focal firm's scarcity rents. Thus, a focal firm taking actions that have a high competitive impact on its rivals will elicit numerous and rapid responses because competitors are more likely to become aware and willing to respond to an action that has great competitive impact on their business.
- / The **easier the imitation** of the focal firm's actions on its competitors' resources, the *less sustainable* the focal firm's scarcity rents. When an action is easy to imitate competitors will respond quickly. If the response

requires substantial resource commitment and major organizational restructuring, rivals will be less likely to respond or will respond more slowly.

- / The greater the **resource similarity** of competitors being attacked with that of the focal firm, the less sustainable the focal firm's scarcity rents.
- / The greater the ability of the competitors being attacked to switch to **substitute resources**, the *less sustainable* the focal firm's scarcity rents.

In conclusion, a focal firm can enhance its resource position relative to that of its competitors' by acting on its competitors' resources. Factor markets and political markets represent competitive arenas where a focal firm can deploy a variety of strategies to reduce the quantity or effectiveness of its competitors' resources, thereby increasing its own scarcity rents. Market and firm characteristics that facilitate the deployment of competitors' resource-oriented strategies are:

#### **Market:**

##### **Firm:**

- / Formation or discontinuity
- / Small number of competitors
- / Existence of property rights
- / Influence of different interest groups
- / Resource heterogeneity
- / Scanning capability
- / Competitor-oriented culture
- / Lobbying capability

Sustainability of the scarcity rents of the focal firm is a function of the competitive impact of the focal firm's actions, the difficulty of imitating those actions, and the capability of the competitors being attacked to retaliate or switch to substitute resources.

### **Ellram et al. (2013)**

In general, firms tend to closely monitor activities and markets for 'valuable, rare, inimitable and nonsubstitutable' (**VRIN**) inputs directly contributing to the firm's' unique advantage, but they do not regularly track markets for non-VRIN inputs.

- / **Factor-market rivalry (FMR)** is defined as: "rivalry over resource position that can flare up at any level or link within a firm's value chain" and focuses on non strategic resources. FMR indicates that unrelated industries compete for the same versatile, mobile non strategic resources.

As the continued growth in outsourcing, offshoring, and global sourcing places increasing demands on the logistics function, economical and reliable supply chain and logistics capabilities emerge as an essential part of a VRIN bundle.

- / Successful strategy implementation is not dependent only on VRIN resources, but also on complementary resources. These complementary, non-VRIN resources are part of a strategic bundle that allows the value of the VRIN resource(s) to be realized and take on a new importance when they are scarce. Scarcity will drive up prices for any factor.
- / Resource dependency theory warns that as a company becomes more dependent on a greater number of organizations that are not visible to them, the potential for problems increases.

Firms should not focus only on rivals in product markets but also on *rivals in supply markets*. Indirect competitors who are participants in the same input markets could develop into direct competitors. If firms lack awareness of other competitive actors in different product markets, this potential threat will remain undetected until it materializes.

The factor-market rivalry (FMR) theory identifies three general rivalry scenarios and how they are related:

- / Occurs where firms use the *same* types of resources to compete in the *same product-markets*. Most firms are aware of competitors who are rivals in product and input markets.
- / Occurs where two firms may buy *similar inputs* and be in *similar industries*, but they are noncompetitive because product-markets do not significantly overlap. Competition may arise as one firm expands and changes its offerings based on perceived opportunities.
- / Evolves in situations where firms use *similar resources* but do *not* compete in *similar markets* nor create similar products. This factor-market only rivalry is very difficult to anticipate and can be very detrimental. E.g. Walmart hiring Amazon's key logistics personnel.

In increasingly global factor-markets competition can come from numerous, unanticipated sources. Defining factor-market competitors and the potential uses for their inputs too narrowly can bring risks and render companies obsolete. This because a company may be surprised and thus unprepared for input factor price increases and scarcity caused by demand from unanticipated resource competition.

Most successful companies monitor their competitors in product-markets and are aware of these competitors' actions. However, nonproduct market competitors' actions in factor-markets are often overlooked, particularly when members of the firm do not recognize that non-VRIN inputs can be part of the bundle of resources that provide essential support to the firm's competitive advantage.

There is a growing recognition of the critical contribution that SCM and purchasing can make to a firm's competitive advantage. When a firm moves its production to a low-cost labor region, it frequently trades lower prices for a longer, less visible and more transport intensive supply chain to the end customer. Within logistics, transportation is an example of a non-VRIN resource

that is often bundled with the more strategic VRIN resources. Without reliable, predictably priced transportation availability, a firm cannot make its products available to its end customers.

In situations where the supply chain capability is viewed as a source of competitive advantage it is bundled with the application technology, not because of assets or capacity alone. This organizational routine or resource orchestration may create sustained performance differences and even competitive advantage among firms.

Economic globalization is largely influenced by a desire to reduce production and material costs as well as compete with lower-cost foreign competitors. An organization's ability to coordinate its worldwide supply chain determines its success in these globalized markets.

- / In a global environment, multiple production and distribution tiers create increasingly higher levels of uncertainty. Thus, effective supply chain and logistics coordination remains critical to manage and balance supply and demand.
- / Because logistics services may not be strategically emphasized in global supply chain planning, rivalry for these types of resources is rarely considered.

However, competition for scarce logistics services can arise from many industries and induce factor-market rivalry (FMR), increasing the value of these services. So, the theory of FMR provides a broad framework that suggests organizations to be wary of FMR for inputs from adjacent and unrelated industries.

Examples of offshoring in Vietnam and China provide evidence of the following propositions:

- / Moving a significant quantity of offshore production to a new geographic area will create FMR for **capacity of supply chain services**.



- / Firms that anticipate and plan for impending FMR for supply chain services from product and non product-market rivals will experience better **on time** performance of goods produced in that region than those that only focus on the behavior of product market competitors.
- / Firms that anticipate and plan for impending FMR for supply chain services from product and non product-market rivals will experience better **cost** performance on goods produced in that region than those that only focus on the behavior of product-market competitors.

Rivalry and its negative impact are commonplace in global markets, but the rivalry for supply chain services often seems to be *unanticipated*, creating disruptive effects. Propositions 2 and 3 suggest that although shortages of resources may be inevitable, the ability to effectively cope with them by managing supply chain assets more effectively than others creates an opportunity to increase competitiveness.

So in conclusion, ignoring the impact of unanticipated competition on logistics and other flexible, non-VRIN inputs when shifting volume geographically, or during economic changes or other disruptions, can create serious consequences. When a firm does not adequately consider and plan for regional supply chain capabilities, such costs can surge. The company can struggle with higher prices, less than optimal alternatives, increased supply chain inventory, reduced supply chain speed, decreased responsiveness and service levels and generally declining market attractiveness.

- / **Proposition 4:** Selective scanning of market conditions and capabilities for supply chain and logistical services in key areas where an organization manufactures, buys or sells its products can be a source of competitive advantage.

Better scanning of market issues can allow firms to plan alternative logistical solutions or perhaps grow in different markets, where they are not experiencing

constraints. Scanning can involve creation of an early-warning system for use both prior to entering a new factor-market, and for monitoring conditions in dynamic markets.

- Logistics or other non-VRIN resource capacity may currently be sufficient, organizations should be aware of growing demand and competition in geographical operating regions. Any such system should be designed to detect crises early, while there is time to respond.

**Potential Indicators of Impending Factor-Market Rivalry**

<b>General Warning Signs</b>	<b>Warning Signs Related to Supply Chain and Logistics Capacity</b>
Government statistics support double digit export growth in that region	Significant manufacturing capacity is being added in the area
Prices are increasing in the region	Roads are being built
Wages are increasing in the region	Logistics resources that your organization is using have no excess capacity
Business flights are being added in the region	Industries that are entering the area will likely use similar transportation modes
Your suppliers mention new customers in other industries	Capacity in the potential problem area is fixed over a certain time period
Excess capacity of productive resources is limited	
Government is offering tax benefits	
Inexpensive land is readily available	