

THE SUPPLY CHAIN RISKS OF GLOBAL SOURCING

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Summary

Global sourcing and supply has become a central part of many companies' operations strategies. It has proved essential to increasing gross and net margin. In the competitive environment characterised by over-capacity, corporate consolidation and depressed spending, global sourcing is a key ingredient for corporate survival – taking advantage of low cost labour, cheap international logistics and less regulated operating environments.

The dash to low cost sourcing and supply areas has displayed an exponential trend and is forecast to continue. But, the inherent supply chain risks embedded in the chase for margin are not well understood and have not been documented extensively. Global sourcing implies long distance supply chains with extended lead times that have major implications for security of supply and for demand responsiveness and freshness of the offer.

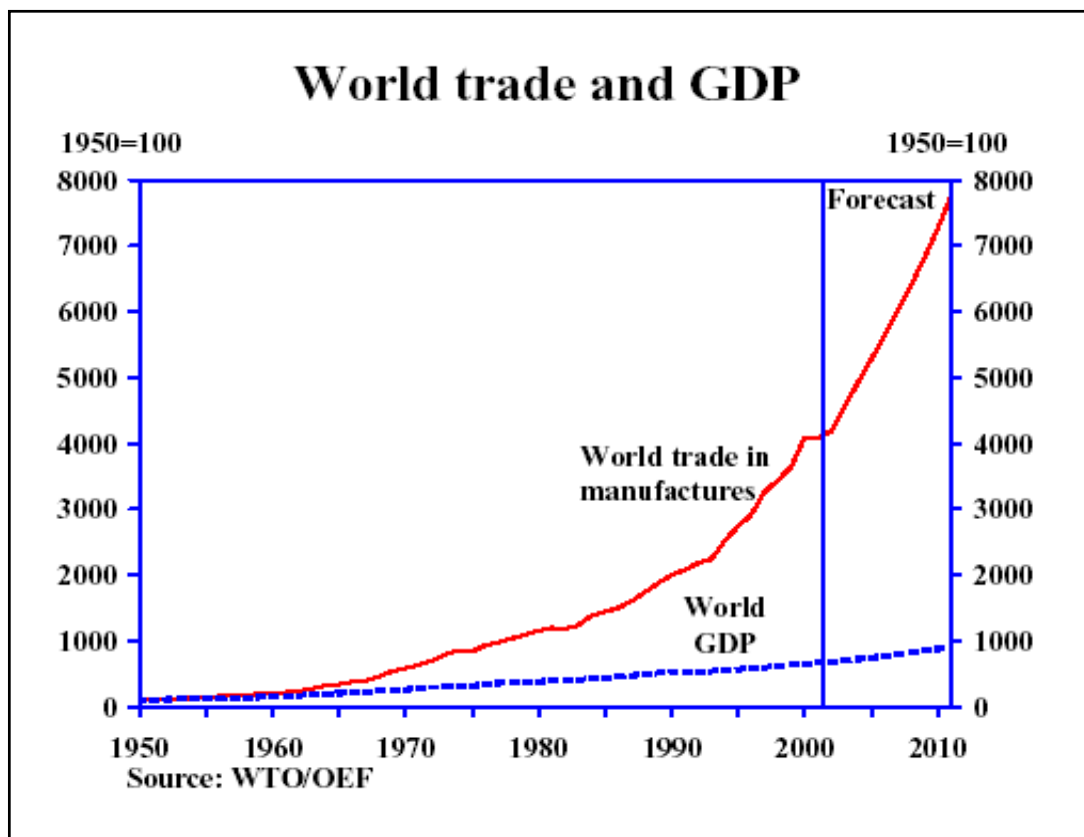
This paper describes the nature of the risks that are faced and how these will not fall equally across a corporation's portfolio of sources, products and customers. It identifies the strategic and operational capabilities that can be used to counter the risks. The conclusion is that mitigation of risks in the trend to global sourcing is entirely feasible and that companies should audit their sourcing strategies and associated operating methods to ensure that their drive to increase margin does not substantially increase risk 'at the margin'.

Global sourcing is an established geo-political and economic fact of life. It is now a market driven trend. But the challenge from such market driven trends are that they invariably reach beyond sustainability; we have seen this most recently with the Internet boom being overtaken by financial reality and pragmatism as the real value and risks were exposed. This paper does not argue against it, but rather that it has trading and supply chain implications that can contain risks, which should be managed.

Growth in Global Trade

The expansion of global trade in manufactured goods has been one of the most pronounced and remarkable economic trends of the last 40 years. It has both fuelled and enabled the growth in GDP of most developed countries: exporting jobs to countries with large and increasingly skilled low cost labour. The capacity of the labour pool in developed countries is being released to high value activities and the service sector. The scale of this shift has been truly seismic and is shown in the graph from the WTO(i.) – Figure 1.

FIGURE 1 – GROWTH IN GLOBAL TRADE IN MANUFACTURES



The implications for the growth of international logistics have been equally profound; the proportion of freight now moved by container dwarfs the general cargo category. At December 2001, the global capacity of container ships in service was 5.5 million TEU (twenty foot units) and there were a further 1.45 million TEU capacity (26%) on order. Maximum ship size has increased from less than 3,000 TEUs to 8,000 TEUs and there is industry talk of vessels of 12,000 TEUs coming into service in the next decade(ii). As a result of these investments in capacity and scale, the reduction in inflation-adjusted unit cost of a container movement has been around 70%(iii).

China has been racking up economic growth of 8% to 9% pa based on this trend and refers to itself with pride as the 'factory to the world'. As with the container business, the investment in capacity in the Chinese economy is sufficient for a further 25% growth.

Global sourcing is now a matter of Board Strategy and Policy for both Retailers and Manufacturers in the USA and Europe. Statements in relation to planned increases in this trend are a regular feature of annual reports and analyst briefings. Wal-Mart, the world's largest corporation, made the trend to direct international sourcing a key feature of its last annual report.

We also are making exciting strides in two other important areas: internal product development and global procurement. Last year we assumed responsibility of global procurement from a third party. This allowed us to better coordinate the entire global supply chain from product development to delivery. In addition, our global procurement program allows us to share our buying power and merchandise network with all our operations throughout the world.

Wal-Mart Annual Report 2002

Dyson closed its entire manufacturing in the UK and moved to Asia as a key element of its entry strategy for the US market. New origins for the garment trade are Turkey and Morocco where companies can still leverage low cost labour, but without full Far East sacrifices on lead-time and flexibility.

The WTO forecasts show that global supply is the future. Indeed, it is irreversible since old capacity is leaving the market because it cannot compete; investments in making many goods are now focused on developing areas. This global sourcing dimension of strategy is now a cornerstone of companies' plans to generate value for customers and shareholders alike; few can envisage a sustainable future without an increasing level of global supply.

There have been two enabling technologies for the story so far:

1. The growth and development of international freight and logistics to add capacity and reduce the real cost per unit moved by as much as 70% as described earlier
2. The introduction of global communications and their widespread adoption to accelerate commerce in developing economies. This revolution has moved through Phone, Telex, Fax, Mobile Phone, Internet, email, SMS and WANs.

The ability to link companies and operations round the world with near real time information exchange, combined with cost effective freight, is a reality. We believe that these capabilities have been central to sustaining the exponential trend of global supply and, with new applications, will be the cornerstones of risk mitigation in the future.

The Supply Chain Characteristics of Global Sourcing

There has been huge investment to secure low unit costs through the chain and serve the volume and economic growth. Governments of all countries have tried to encourage in-bound investment to secure employment through tax breaks and preferential treatments. The low wage areas of Asia have attracted high labour content work from garments to computers to consumer products to engineering.

Against this background of the drive for low cost, the first core characteristic of global sourcing is that it is not 'adjacent'. Global chains are extended in terms of the time that is locked up in the sequential processes of ordering, provisioning, manufacturing and shipping. This extended time is a precondition of the margin opportunities that can be extracted from global sourcing. It is therefore not value-adding but it is essential.

Work by the author for Maersk Logistics (iv) indicates that the global supply chain time content contributes in the range 30% to 50% of the total time in the chain, but 2% to 5% of the final cost of the article. Indicatively the gross margin gain is not less than 20% and is often much more.

The same work showed that there could be as many as 7 additional parties to executing the global sourcing transaction, including consolidation centres, shipping lines, customs and compliance authorities.

The second characteristic relates to the nature of capacity; it is generally incremental capacity with a lower breakeven point and will be 'sticky'. The investments in capacity to service global markets are clearly either replacing or supplementing existing capacity. Based on the WTO graph shown earlier of the growth in global trade in manufactured items, it is reasonable to assume that both conditions may prevail. Laying down additional capacity in developing countries creates socio-economic expectations of employment and prosperity. Aligned with the need to secure a return on the investment and the somewhat 'looser' interpretations of return on capital that are found in the East, the pressures to produce will be such that prices will be lowered until capacity is consumed.

We can therefore expect that availability of a seemingly limitless labour force that is increasingly well educated and a determination to make investments pay will create a platform for sustained deflationary pressures on prices and capacity that will 'stick around'. The behavioural impacts of producers and buyers both fighting to maximise margin at the expense of each other, will create a trading environment that is potential volatile, 'promiscuous' and unreliable in supply chain terms.

We can conclude that the policy of global sourcing is an imperative; it has raised the competitive 'bar' to the point where it has become a qualifier for survival rather than a competitive edge in its own right. But the combined characteristics of a changed supply~demand profile and extended timescales build in levels of risk that need to be understood and managed to ensure a net benefit from the long term trend to global supply.

The Risk Profile of Global Sourcing

Markides and Berg writing in the Harvard Business Review in 1988(v) identified the trends to manufacturing offshore and roundly criticised it as being both unnecessary and risky. They argued that existing manufacturing capacity could be made more competitive and that the hidden costs of obsolescence, inventory holding and demand unresponsiveness are risks that counter the headline benefits. Given the date of the paper and scale of the subsequent trend, their warnings have been ignored.

However the risks of global sourcing may yet be coming into focus as the 'first mover advantage' dissipates. If we set to one side their assertion that the trend to global supply is unnecessary and deal with the reality, their catalogue of the risks remains accurate today.

- 1 There are risks that the total acquisition cost may be greater than anticipated and erode the net benefits that the initial purchase cost imply; When all factors including transportation, handling, duty, obsolescence, inventory, lost sales and ‘market blocking’ are factored in, the total cost may not be as attractive as the headline advantage – labour costs are typically as little as 7% to 10% of the total product costs and even less on the selling price.
- 2 The extended chain cannot be as responsive to variations in demand as local sourcing – hence there may be opportunity costs of lost sales.
- 3 There may be risks with quality and execution due to the long distance relationships and the many hand-offs in the processes to move the product to its destination – inaccuracies cause service failure and hence cost.
- 4 Valuable know-how may be given away to vendors allowing others to enter markets and for product and engineering skills to be lost.
- 5 The long-term impact on supply and demand is less clear and may distort markets both in terms of the benefits gained and also for the risks of secure supply.

At the headline level, these factors are known and understood. How companies internalise them and mitigate their implications may be less consistent. The conclusion is global sourcing is not a consistent proxy for sustained higher profits. The volatilities of the business climate, consumer demand, competitive actions, fashion, quality of execution and market dynamics, inter alia, all combine to make the outcome less certain than deterministic planning models would have us believe. Boards will need to start to focus on the complete mix.

Research at Cranfield School of Management (vi) sponsored by the British Department of Transport into the origins of supply chain risk and vulnerability has identified the following dimensions of risk in the supply chain –divided into external and internal ‘drivers’. These are shown in Figure 2.

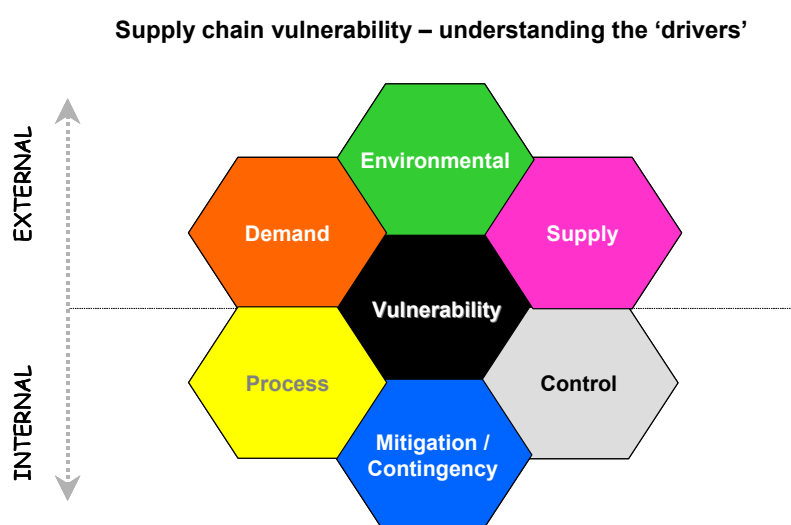


FIGURE 2 – THE DRIVERS OF SUPPLY CHAIN RISK

Risks external to the corporation can be summarised from this work as follows

- ◆ **Demand risk** relates to potential or actual disturbances to flow of product, information, and cash, emanating from within the network, between the focal firm and its market. In particular, it relates to the processes, controls, asset and infrastructure dependencies of the organisations downstream and adjacent to the focal firm.
- ◆ **Supply risk** is the upstream equivalent of demand risk; it relates to potential or actual disturbances to the flow of product or information emanating within the network, upstream of the focal firm.
- ◆ **Environmental risk** is the risk associated with external and, from the firm's perspective, uncontrollable events. The risks can impact the firm directly or through its suppliers and customers.

Risks internal to the corporation relate both to how the firm addresses the external risks and its competences to plan and execute its own business.

- ◆ **Processes** are the sequences of value-adding and managerial activities undertaken by the firm. The execution of these processes is likely to be immediately dependent on internally-owned or managed assets and on a functioning infrastructure. Process risk relates to disruptions to these processes.
- ◆ **Controls** are the assumptions, rules, systems and procedures that govern how an organisation exerts control over the processes. In terms of the supply chain they may be order quantities, batch sizes, safety stock policies etc. plus the policies and procedures that govern asset and transportation management. Control risk is therefore the risk arising from the application or misapplication of these rules.
- ◆ **Mitigation** is a hedge against risk built into the operations themselves and, therefore, the lack of mitigating tactics is a risk in itself. **Contingency** is the existence of a prepared plan and the identification of resources that can be mobilised in the event of a risk being identified.

In the model in Figure 2, Mitigation / Contingency is an internal driver that can be put in place to compensate for some aspects of Supply, Demand, Environmental, Process and Control risks. The absence of mitigation and contingency is therefore a risk in its own right.

It should be immediately clear that global sourcing and supply has the potential to increase all of these dimensions of risk and that they are thematically consistent with Markides and Berg's observations.

Measures to Mitigate Supply Chain Risk

An emerging role of supply chain management is to identify and 'manage to mitigate' structural risk within extended supply chains – both external and internal. It must shape and deliver sourcing, product design, channel management, logistic networks and customer service that creates a different kind of risk < > net margin profile.

This new profile will inform management's choices in relation to their market place and strategic development. This thinking will likely be at the heart of any firm developing a Balanced Scorecard but supply chain risk thinking introduces an entirely new risk agenda as a policy engine for the business.

Supply chain and logistics theory has relied in its development on the following classic risk mitigations. As we can see they may no longer be sufficient to deal with all conditions equally:

- Inventory – positioning of inventory in the chain to buffer against the uncertainties of demand, supply and operations. With the extended lead times associated with long distance chains, there will be more inventory in the chain. But, in the context of shortening market lifecycles this inventory may become more of a risk than a buffer. Provisioning the chain in anticipation of supply side unreliability can easily accentuate rather than mitigate risk.
- Capacity – the nature of the installed capacity and its ability to respond to actual demand. Flexible manufacturing strategies include short scheduling horizons and fixed cycle manufacturing programmes. But extended global chains are less able to benefit from such methods; plants must manage the conflicts of demands from various clients, and this means that extended schedules are the norm. In addition, declining returns from manufacturing operations due to global overcapacity will encourage over-committing capacity and schedule non-compliance.
- Dual sourcing – the balancing of procurement between two or more suppliers has been a conventional supply side strategy, but this has changed in recent years as vendors have operated more collaboratively and offered cost reductions for single sourcing. The risks inherent in global supply and the challenges in finding and establishing multiple vendors makes the dual sourcing approach even less likely, thus increasing long term dependency and hence risk.

There are variations on these themes that, when combined, can help to mitigate the risks that are no longer solved by these headline measures:

- ◆ Generic material inventory – the company commits to generic materials which it is confident can be converted into a number of products or disposed of at market price. This reduces the lead time to procure material and make the products - so increasing responsiveness
- ◆ Capacity booking with postponed ordering – the company commits to manufacturing capacity for a range of products to be made by the vendor. The actual commitment in terms of sku and quantity is made based on the latest forecast just before the run starts
- ◆ Postponement – the design and supply of manufactured parts that can be configured or localised in the destination markets. This enables generic parts to be directed to where the demand is and avoids product obsolescence. It also reduces inventory levels in the chain as a whole(vii).
- ◆ Consolidation / deconsolidation / speed management – logistics operations that can identify, combine and route products through the chain to increase the frequency of shipment and reduce unnecessary time through the chain. The net effect is to make the chain more responsive, increase availability and reduce inventory risk.

These risk mitigation techniques are at the heart of improved management of the global chain. Application of these techniques requires some key capabilities and pre-conditions.

Critical Success Factors

The measures to mitigate risk in global supply chains require 6 capabilities. It is these capabilities that are the critical success factors and enable the types of actions described earlier. The authors' work with Maersk Logistics identified and described five of these six 'backbone' capabilities (iv). The total acquisition cost management capability was outside the scope of that work.

1. **'Total Acquisition Cost Management'** – the ability to analyse and predict the total cost-to-serve from the source of supply to its final point of sale. The capability in this analysis is not to simply build up the logistics costs by differentiating the physical characteristics of the freight and the duty and customs regimes that are applicable. It is more important to analyse and build into the costing the inherent markdown and lost sales risk of the product by developing and applying a market \diamond risk \diamond cost risk profile. The inventory holding cost through the chain must also be factored in. Experience has shown that this analysis identifies products that should never be traded on a long lead-time, or that should be the subject of a postponement strategy. It is also likely to show that there are some products where actions to reduce lead-time and increase flexibility will justify a higher initial purchasing cost.
2. **'One touch information flow'** – to avoid double entry, duplication, mistakes and inconsistency as the same transaction moves through the many points of contact in the chain. Accuracy of information is a precondition of pro-active management and the ability to exercise risk mitigation measures. This capability is systems enabled; it is critical to have the widest view of the total chain on one information platform with the ability to recognise inconsistencies.
3. **'Total product identification and compliance'** – to ensure fast accurate product and handling unit identification that feeds the "one touch information" requirement without delay. The use of bar codes and RFID to the correct standards is the enabling technology; this needs to be quality assured and enforced on the ground across many sites with failures being fixed where they occur.
4. **'Real time routing through dynamic visibility'** – the capability to see through the chain, know what is coming, and test for events that have not happened as planned; to interpret the implications of failures in a pro-active way and make decisions to minimise their impact. This is the 'traffic control' of global supply chain management; it must be managed transparently and with the proactive co-operation of all the parties in the chain.
5. **'Vendor development - cycle time compression linked to real demand'** – the capability to understand and improve the long-term performance of vendors in terms of cycle times, timeliness, quality and accuracy is central to time compression and risk reduction. Based on historical performance of the end-to-end chain it is possible to identify improvements programmes to develop supplier reliability. The ultimate goal is to issue orders and schedules on shorter lead times, reflecting real demand or more accurate forecasts. Understanding the underlying performance of the vendor, and his category of products in the marketplace is the starting point for this; it is dependent on information across the chain.

6. **Information platform to provide consistent and timely information** – the capability to put in place, operate and maintain a full supply chain visibility solution. All of the above capabilities are anchored by the operational skill to secure and maintain the information backbone with the diverse data structures that are needed by each supply chain function.

All of these capabilities relate to management information and the skills to apply that information with greater precision; information on the extended chain in terms of accuracy and speed of availability is central to these capabilities.

Event management solutions are emerging to fill the need for an information backbone as a central enabler of risk management. Global consistency of information on “plan and status” across the extended chain is the platform for making more better decisions and executing them effectively.

Best Practice audit framework for Global Sourcing

Based on this analysis, the requirement, for every firm increasing its global activity levels, is to be able to assess, firstly, how the risks stack up in its case and, secondly, how well the company is organised to address. While a full description is beyond the scope of this paper, the following provides headlines to each dimension.

Figure 3 shows a global sourcing risk assessment ‘audit’ that can be conducted through a ten-stage process. The big ideas that are conveyed through this diagram are that the firm’s risk profile is capable of analysis and that the range / categories / supply markets in which a company operates can be segmented and managed used focused processes. The analysis in this diagram will point to sustainable sourcing strategies that will maximise net margin.

FIGURE 3 – AN AUDIT APPROACH

A 10 stage ‘audit’ approach to de-risking global supply chain management

Step 1 Demand risk assessment	Evaluate and characterise the demand risk profiles of the products in the range – expressed in terms of volatility, availability and markdowns
Step 2 Inventory performance	Evaluate the inventory performance through the chain and determine the performance in relation to demand volatility and lead time
Step 3 Current procurement ‘conditions’	Understand current procurement conditions and test how they relate to best practice – including lead times, capacity management, horizons and material supply
Step 4 Demand:inventory:‘conditions’ correlation	Correlate the demand, inventory and procurement analysis to show the statistical ‘pockets of risk’ by category
Step 5 End-to-end cost-to-serve analysis	Develop the end-to-end cost to serve to identify the areas of ‘no go’ and maximum potential leverage
Step 6 Apply 4 & 5 to generate risk return profile	Complete the segmentation analysis to set category and range procurement strategies against the risk return profiles
Step 7 Identify categories for major sourcing policy change	Map the proposed segmentation approach against the current sourcing profiles and identify areas for change
Step 8 Identify categories for changes to sourcing ‘conditions’	For the categories that will need sourcing condition changes – define the new conditions of supply
Step 9 Identify sources and routings for flow capability development	For the categories that will require new process and logistics –define the new requirements
Step 10 Redesign processes, information flows & organisation to align to 1-9	Based on 1 to 9 above, move to organisation and systems redesign

This audit will inevitably unpack into actions in four key areas:

- ◆ Infrastructure – putting in place the infrastructure that is needed to support only the viable flows
- ◆ Stewardship – setting up the organisation to span procurement, supply development, logistics, commercial and third party operators with a unified set of objectives and performance measures – both reflecting the needs of the designated flows and reviewing their applicability on a regular basis
- ◆ Processes – designing and implementing the planning and execution processes that will sustain the flow characteristics
- ◆ Information – specifying and implementing the information backbone that will bind the extended chain together, enabling the flows, stewardship and processes.

Global sourcing –sustaining of the trend

It is clear that ‘first movers’ to global sourcing have gained a competitive advantage. Often these were traders who had an intimate knowledge of a supply market in terms of the vendors and their capabilities as well as the logistics to get the product to the market. They committed to stock risk and knew where to dispose of product if the original channel did not work. For this they earned a respectable margin for the risks they took.

As we saw earlier from the Wal*Mart quote, the major buyers are moving to ‘disintermediate’ the traders. This is a term derived from the Internet boom when the Internet was forecast to cut out the middleman or make new virtual portals that could replace their expertise.

When the Internet boom crumbled, many commentators attributed this to a lack of viability of the concept. But Business Week (viii) recently featured an analysis showing that the volumes forecast for the Internet were being achieved; it is only the profitability that has proved a disappointment.

Global sourcing will be dependent on the Internet for the information backbone, so the parallels between the two developments are worth drawing. It appears that as the trend for global sourcing accelerates, the risk of companies making unwise and structurally unprofitable choices will increase. As with the Internet a road that is seemingly paved with gold could prove to be an investment mirage. The paradox is that like the Internet, global sourcing is here to stay.

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