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Outlook on the Logistics & Supply Chain Industry

Global Agenda on Logistics & Supply Chains

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The World Economic Forum's Global Agenda Councils (GACs) are unique multistakeholder groups that convene leading thought leaders from academia, government, business and other fields to capture the best knowledge on key issues and integrate them into global collaboration and decision-making processes. The GACs also serve an advisory role to the World Economic Forum, providing guidance, insight and potential solutions to the most important issues on the global agenda.

The Forum's Logistics & Supply Chain GAC (hereafter referred to as "the Council") has completed a successful second, one-year term. The Council has focused on a wide range of issues and risks facing the broad logistics and supply chain industry, including trade facilitation, supply chain risk, transport infrastructure, supply chain talent and sustainability.

Over the last two years, the Council has delivered significant impact through:

- Engaging actively and providing intellectual leadership in several Forum projects on supply chain risk, trade facilitation and supply chain sustainability
- Contributing to the dialogue on important supply chain issues at Forum events like the Annual Meeting in Davos-Klosters, Switzerland and other Forum Regional Summits
- Providing insight to the Forum's Supply Chain & Transport Industry Partners with the Council Chair Prof Alan McKinnon presenting the Council's key insights and recommendations to the chief executives (Governors) of the Forum's Supply Chain & Transport Industry programme at Davos
- Publishing articles in several trade journals and the Forum blog.

The Council convenes annually at the Forum's Summit on the Global Agenda in the United Arab Emirates in November, at which they also have the opportunity to engage with several other GACs from the wider GAC network, on issues of mutual interest. Through the rest of the year, the Council convenes on monthly teleconferences.

This publication endeavours to capture some of the rich dialogue and insight that the Council has generated over the past year, with a summary of its key insights and recommendations, as well as a series of articles by Council members on some of the key issues, risks and opportunities facing the industry: piracy and skills shortages, a volatile container shipping industry, the opportunities afforded by logistics clusters, and the expansion of the Panama Canal. At the Summit on the Global Agenda in 2011, the GACs were exhorted to brainstorm and develop new models for approaching complex global challenges. Through its interaction with the Global Trade Systems GAC, the Council has proposed a new model of trade cooperation that focuses on a bundle of supply chain issues rather than just tariffs, so that the business relevance of trade agreements could be increased. This is described in the article by Bernard Hoekman, Director, International Trade Department, World Bank, Washington DC.

On behalf of the World Economic Forum, we wish to thank the Council Members for their contributions and we look forward to another productive year. We would especially like to thank the Council Chair, Alan McKinnon, Professor and Head of Logistics, Kühne Logistics University, Germany, for his stewardship of the Council over 2010-2012 and for editing this publication.

Introduction

Welcome to the second report of the Logistics & Supply Chain Global Agenda Council (hereafter “the Council”). It comprises a series of papers written by eleven members of the Council on issues of importance to the logistics industry. Some of the issues identified by the Council in its first year (2010-2011) have been examined in more detail in the second, while several others have emerged. New members have joined the Council in 2011, bringing in fresh expertise and broadening its geographical horizons. This is reflected in the varied content of this report.

The overriding theme of the report is the role of logistics in the facilitation of international trade. In the introductory paper, Bernard Hoekman explains how the traditional system of trade negotiation is ill-suited to a global economy criss-crossed by complex supply chains in which value is added incrementally in numerous locations. As supply chains become more transport-intensive, they become more dependent on the quality and efficiency of infrastructure, logistics services and customs-clearance procedures. This is not sufficiently recognized in regional trade negotiations. To demonstrate to trade negotiators the potential for improved logistics to facilitate trade, the Council is working jointly with the GAC on the Global Trade System, the World Bank and Bain & Company to examine the impact of various logistics-related barriers. The results of this study should be available in early 2013.

One major physical constriction on the flow of trade in the Americas is the capacity of the Panama Canal. In his paper, Rodolfo Sabonge describes how the current expansion of the canal will allow it to handle vessels roughly three times larger than today and accommodate much larger trade flows. He then considers the wider implications for the configuration of global supply chains and port development along the Eastern seaboard of the United States, in the Gulf of Mexico and within Panama itself.

As a “premier trans-shipment hub”, Panama is an example of what Yossi Sheffi, in his paper, terms “logistics clusters”, via which a range of logistics services congregate at strategic locations, exploiting economies of scope, scale and density and becoming nuclei for regional economic development. Sheffi makes a persuasive case for concentrating logistics capacity in these clusters which are increasingly becoming major nodes in the international supply chains of companies.

Rob Kusiciel and Don Ratliff focus their attention on the key link in many of these supply chains: the trans-continental

movement of freight by deep-sea container. They are very critical, from academic and business perspectives, of the deep-sea container system, arguing that the “spot market mentality” and widening boom-bust cycles are posing a major threat to the long-term growth of international trade. Kusiciel advocates a “paradigm shift” to container shipping services that are more contract-based, customer-focused and consistent. Ratliff questions the wisdom of shipping lines investing in a new generation of even bigger vessels and argues that it reveals a “disconnect between the container shipping industry and its customers”.

A restructuring of the deep-sea shipping market, along the lines proposed by Kusiciel and Ratliff, would yield environmental as well as economic benefits. The environmental, or more specifically carbon, impact of supply chains is the main focus of my own paper. It casts doubt on the feasibility and desirability of measuring the supply chain emissions of individual consumer products to permit their carbon labelling. It notes that much of the early enthusiasm for carbon labelling has waned, as major corporations such as Tesco and Wal-Mart have discovered just how complex, costly and time-consuming it is to carbon footprint at a product level.

The papers by Mohammed Sharaf and John Manners-Bell address two other critical aspects of supply chain management: information and communication technology (ICT) and skills. The paper by Sharaf illustrates how various forms of ICT have helped the port operator, DP World, to facilitate the movement of trade through its terminals and to increase labour productivity. He shows how even basic equipment, such as mobile phones, can be used to create new forms of “virtual supply chain” which are likely to be “transformational”. It can, for example, enhance manpower planning, cutting the time required for a port operation by up to 30%. Raising the productivity of the existing logistics workforce is not the only human resources’ issue facing the sector. As Manners-Bell points out, logistics managers around the world are experiencing difficulty in recruiting new staff with the requisite skills. He reports the results of a global survey of 300 logistics executives, roughly two thirds of which claimed that they had a problem filling posts. They attributed this mainly to an inadequate supply of good candidates, low-average wages and the industry’s relatively poor profile as an employer.

India is currently suffering a shortage of logistics skills. This is partly due to the rapid growth in demand for logistics services discussed in the paper by Vineet Agarwal. The combined effects of economic and

population growth is fuelling a 15-20% annual growth of the Indian logistics industry, which, among other effects, is placing a strain on the country’s road and rail infrastructure. Agarwal argues that the country needs a National Logistics policy to support “focused investment in logistics infrastructure”, greater coordination between transport modes and a concerted effort to develop people skills in supply chain functions.

The two concluding papers provide differing viewpoints on a topic which has generated a great deal of interest in recent years within our Council, across the World Economic Forum and in business and government circles worldwide: global supply chain risk. Jonathan Wright summarizes the main findings of the joint World Economic Forum/Accenture study on this subject. Published in January 2012, it was based on “a multi-pronged initiative of surveys and executive interviews across industries and regions”. Wright’s paper highlights the need for better risk metrics, improved scenario planning, a greater willingness to collaborate and the simplification and internationalization of “risk legislation”. Businesses and governments are exhorted to adopt a new approach to supply chain risk that he calls “dynamic operations”.

A generic approach such as this needs to be accompanied by more specific sets of measures targeted on particular supply chain threats. In her paper, Elizabeth Greig examines the scale of the threat posed by Somali pirates who, since 2008, have been violently attacking hundreds of merchant ships and have held over 3,500 seafarers captive. She proposes that the numerous agencies dealing with this problem adopt a more “comprehensive approach”, including stronger naval intervention, better regulation of the maritime security industry and joint efforts to find “alternative livelihoods for would-be pirates”.

Members of the Council have identified what they regard as some of the major challenges confronting the logistics industry and suggested ways of dealing with them. Although the report is problem-focused, the Council does not wish to present the industry in a negative light. On the contrary, the logistics industry is one of the main growth sectors in the global economy and is absolutely critical to the improvement of living standards around the world.

Alan McKinnon

Professor and Head of Logistics in the Kühne Logistics University, Hamburg; Chair of the Logistics & Supply Chain Global Agenda Council, World Economic Forum

Key Council Insights and Recommendations

The Council has distilled a series of key insights and recommendations for the chief executives (Governors) of the Forum's Supply Chain & Transport Industry programme, as well as for a wider audience of industry executives and policy-makers.

Logistics and Trade Facilitation

Despite efforts over the past year to revive the Doha round of trade negotiations, there appears to be little prospect of them succeeding; hence the Council's main focus in terms of trade facilitation to switch from the global to the regional level.

There is growing acceptance that the traditional form of negotiation, which was preoccupied with trade barriers and tariffs, is outdated in a world criss-crossed by complex supply chains in which value is added incrementally, in numerous locations. Research has shown that deficiencies in the physical movement of goods are a greater deterrent to trade growth than institutional trade barriers. Often these logistical constraints are not confined to the borders, but extend across the internal infrastructure and freight market. The importance of these constraints is not sufficiently recognized by trade negotiators. Partly, this is because they lack an understanding of modern supply chain practices, but also because do not adequately consult the businesses affected. Discussions with the Global Trade Systems council confirmed this general "diagnosis" of the problem and outlined a possible way forward.

Recommendations

To highlight the critical role of logistics in trade facilitation, the Council recommended that the Forum launch an initiative with the following objectives:

- Assess what has been done and is being pursued at the regional trade negotiation level, from the perspective of international supply chains
- Analyse several specific supply chains with a view to identifying comprehensively all of the major policies and regulatory requirements that impact on the supply chain; and to quantify the effect of these various factors on the final cost of the products concerned

- On the basis of this information, to extrapolate an estimate of the impact of prevailing policies that affect the efficiency of supply chains on economic welfare (real incomes) for a country or region
- "Unpack" the sources of these potential supply chain costs into different components, to separate out policy drivers from other factors (e.g. infrastructure weaknesses), with a view to identifying low-hanging fruit so that targeted institutional action can be recommended to harvest it
- Propose a set of principles, approaches and performance targets that could be embedded in trade agreements and to identify key gaps in the coverage of what is currently on the table in the World Trade Organization (WTO) or regional trade negotiating context, (certain areas of regulation and government policies have a significant impact on the functioning of international supply chains and could be the subject of specific, binding commitments by governments)

The above recommendations were presented and fully endorsed by the Governors of the Forum's Logistics & Transport Industry. They also supported the creation of the Forum's Enabling Trade – Valuing Growth Opportunities initiative, which endeavours to introduce a supply chain approach to trade negotiations and cooperation by identifying and quantifying the impact of regulation and policies on the functioning of international supply chains.

Supply Chain Risk and Resilience

Supply chain complexity and "interconnectedness" is increasing rapidly at a time when the risk of disruption caused by extremes – such as geophysical disasters, terrorism and strikes – is mounting. In addition to the standard list of "mega-threats", the Council drew attention to others which could have a major impact in the next few years. Potential risks include:

- Piracy: if this continues unchecked, it may precipitate industrial action by maritime trade unions
- Bankruptcy of one or more major carriers: although the freight market would adjust, the removal of significant amounts of maritime or air freight capacity at short notice could dislocate time-sensitive global supply chains
- Cyber attack: paralysing cloud computing networks on which logistics systems are becoming increasingly dependent. More needs to be done to "stress-test" supply chains against potential risks and to take "near misses" into account. Analysis of near misses in the aviation sector has greatly enhanced air safety.

Recommendations

1. Continue to support the wider Supply Chain and Transport Risk initiative, which was created after Davos 2011, based on the Council's proposal. Specifically, the Council will continue to build "risk response" networks of organizations exposed to supply chain risks.
2. Give greater priority to developments likely to pose a greater supply chain risk in the short- to medium-term, such as piracy.
3. Through liaison with the Catastrophic Risk and Disaster Management Councils, apply the latest thinking on risk management and disaster recovery to logistical systems.

Supply Chain Decarbonization

The Council noted that over the past year, several major logistics-related developments have occurred under this heading. In the maritime sector, significant progress had been made in establishing energy efficiency standards for new vessels. The use of market-based instruments to promote carbon-efficiency was discussed actively.

In effect, the European Union set a target of reducing CO₂ emissions from transport by 60% by 2050, with “zero-emission city logistics” by 2020. The World Economic Forum has taken the lead in trying to get a group of international organizations to harmonize the measurement and reporting of greenhouse gas (GHG) emissions from freight transport. In their individual capacity, Council members are contributing to these initiatives.

Together with the Climate Change council, the Council is exploring the opportunity to present logistics as a sector in which industry-led initiatives are achieving significant reductions in carbon intensity. To date, the Climate Change council has been preoccupied with macro-level, top-down approaches to cutting GHG emissions. It is now interested in developing industry case studies to show how “bottom-up” efforts by individual companies and trade associations can yield significant carbon savings, independently of new global agreements on climate change.

Recommendations

1. Continue to support the Forum’s work on supply chain decarbonization, consignment-level carbon measurement and the harmonization of carbon measurement and reporting standards and procedures.
2. Jointly with the Climate Change council, prepare a document outlining the efforts of the logistics sector to improve the measurement of its GHG emissions and decarbonize its activities.

Supply Chain Skills Gap

Logistics companies and trade associations around the world are reporting problems in obtaining enough qualified staff. Over the past year, studies done in India, Korea, China and the United Kingdom have confirmed that there is a skill shortage in logistics.

Indeed, as stated by Rüdiger Grube, Chairman and Chief Executive Officer, Deutsche Bahn, Germany: “The demographic changes that we see occurring in many of the regions where we operate – shrinking populations, an aging workforce, and diversifying demographics – compound the challenges we face and intensify the war for talent.”

To shed new light on the problem a Council member, John Manners-Bell, Editor and Chief Executive Officer, Transport Intelligence, United Kingdom, conducted an international survey of logistics executives. Results revealed that two thirds of the respondents had trouble finding enough qualified staff. Many respondents complained about the low profile given to logistics in schools and colleges.

There are nevertheless initiatives in some countries to improve the image of logistics for potential recruits and to improve skills at all levels in the employment hierarchy. As a result, the Council will continue playing a role in raising awareness about this matter among public policy-makers and in cross-fertilizing good practice in the development of logistics skills.

Recommendations

1. Publicize the results of the international executive survey through the World Economic Forum, to raise awareness about this issue
2. Liaise with key players in logistics training bodies and professional institutes around the world to determine what is being done to address the skills shortage
3. Prepare a report outlining the efforts that are being made in different countries to improve the attractiveness of careers in logistics and to raise related skill levels

Global Supply Chains, Logistics Services and International Cooperation

International supply chains are an ever more prominent feature of global commerce. The production of manufactured goods is organized increasingly through global value or supply chains, with goods being processed (value being added) in multiple countries that are part of the chain. Plants in each country specialize in specific processing activities that make up a final product. Economists call the process “vertical specialization”. One implication is that more than half of world trade today comprises intermediate inputs. For the world as a whole, the import content of exports has been estimated to be about 30% (Daudin, Riffart and Schweisguth, 2011).

The “geographic fragmentation of production” has been a major driver of the growth in global trade volumes in recent decades and has been supported by a process of steady liberalization of trade (reductions in tariffs; removal of quantitative import restrictions; and multiple exchange rate regimes). The rise of international supply chains implies that governments today have less of an incentive to impose trade barriers than in the past.

High tariffs are a tax on “downstream” processing parts of the chain, so importing countries have an incentive to keep tariffs low. Firms that process the inputs also have an interest in the governments of the countries producing components to keep trade costs low – including through low or zero tariffs. This benefits the exporting countries that are further down the chain, as well as those that produce the inputs through higher overall exports (sales of the final product). Gawande, Hoekman and Cui (2011) show that the intensity of vertical specialization helps explain the limited recourse to protection in the period following the 2008 financial crisis and global recession.

Many governments around the world are concerned with identifying and implementing policies that will assist national firms to become part of global supply chains and to “move up the chain” – contributing a greater share of the total value of a final product. Many policies are relevant in this connection, ranging from education and skills development to tax and regulatory regimes. A key factor for the ability of a country to participate in supply chains is the efficiency of its local trade facilitation and logistics services. Every extra day it takes to get a consignment to its destination in Africa is equivalent to a 1.5% additional tax (Freund and Rocha, 2011). Even if tariffs on export markets are zero, if firms in a country confront high cost and inefficient logistics, they will not be able to compete with firms benefiting from an efficient logistics environment.

For some years now, the World Bank has compiled a logistics performance index (LPI) for about 150 countries. The LPI captures different dimensions of the determinants of the supply chain performance of countries and illustrates how customs-clearance procedures and the quality of trade-related infrastructure affect the operations of logistics services providers. It also shows the importance of the quality of transport services and related intermediation, e.g. timeliness of delivery and the ability to track and trace consignments.¹ The LPI report illustrates that government policies have an important impact on logistics performance. Countries that have been pursuing measures to improve border management and to facilitate trade have seen their LPI scores improve significantly over time.

It is increasingly understood by policy-makers that policies affecting the operation of different parts of the global supply chain for a product are often more constraining than traditional trade policies, such as tariffs. Modern supply chain practices require that logistics constraints be addressed in a comprehensive manner, from point of production to point of final consumption or sale. The extent to which policies – or the lack thereof – give rise to supply chain inefficiencies is often not well understood or even taken into consideration by policy-makers, in both the domestic and international context.

¹ The most recent edition of the LPI was released in May 2012. See World Bank (2012). The LPI is based on 6,000 country assessments by some 1,000 international freight forwarders.

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At the national or local level, many of the policies that may raise costs or reduce the ability of firms to improve the efficiency of supply chains are regulatory in nature, e.g. transportation- and distribution-related standards and policies, such as maximum truck size, axle loads, size of retail outlets, zoning restrictions for wholesale and retail operations. There may be limitations on investment in certain types of activities. Entry into a market or the supply of certain services may be impeded as the result of exclusivity or preferential treatment for state-owned or -supported enterprises. The functioning of some parts of a supply chain may be impeded as a result of the exercise of market power by a dominant supplier or entity controlling access to a gateway, facilities or networks. In short, a variety of factors may raise the cost of operating a supply chain.

Insufficient recognition is given to the importance of identifying the policies that affect the operation of supply chains as a whole and assessing to what extent policies (or the lack thereof) are the source of supply chain chokepoints. Matters are complicated by the fact that such policies are not limited to those of the national (and local) government. The policies of other countries can also significantly effect supply chain efficiency and may impose costs on firms that are so high that they suppress business activity.

Foreign governments may apply a variety of restrictive policies. Such restrictions range from escalating tariffs – making it more profitable to import raw materials as opposed to processed products from locations where such processing is conducted more efficiently – to redundant testing and inspection at borders. There are also cross-border restrictions on trucking companies picking up loads on the return trip. Other obstacles include: bilateral treaties that distort competition by guaranteeing a share of the market to a less competitive local industry through freight sharing agreements; sabotage restrictions (banning foreign firms from shipping consignments within a country); business visa restrictions; non-recognition of professional accreditations; and security requirements.

A key problem is that “bad” policies artificially “break” the supply chain by introducing discontinuity and reducing reliability. Such policies include those that are enforced at the border (such as customs, health and security), as well as those affecting service delivery. They fragment and lower the quality of service by imposing barriers to entry, specific freight regulations, national monopolies (e.g. postal service) and a lack of competition in the provision of key infrastructure services, like port operations.

Logistics, as such, is not a focus of negotiations or cooperation between governments. Instead, historically its focus has been on reducing barriers to trade for specific products and sectors – tariffs, subsidies and different types of nontariff barriers – as well on agreeing to rules with respect to the procedures to be followed by governments in clearing goods through customs. While these are all important areas of policy that give rise to trade costs for businesses, the lack of a “whole of the supply chain focus” in trade negotiations and trade agreements means that key factors affecting supply chain efficiency are not addressed. The benefits of what has been agreed to business are thus reduced.

For example, if tariffs and other policies restricting trade are removed, yet entry into the domestic distribution or transport services sector is constrained, the costs of establishing or expanding a supply chain may remain too high to attract additional investment. An approach centring on all of the policies that have a major impact on the efficiency of supply chains offers an opportunity to significantly enhance the commercial relevance of trade agreements.

Such an approach has been advocated by the integrators. In the WTO context, a proposal has been made by business to focus on logistics – bringing together a variety of service sectors and sub-sectors that are relevant from a logistics perspective (cargo handling, storage, warehousing, agency services, related ancillary services, as well as all freight services: air, road, rail, maritime and express/courier).

Negotiating commitments on these various services (treated as a “bundle”) together with parallel negotiations on trade facilitation – such as customs clearance procedures and transit regimes – and on existing disciplines for product standards and technical regulations, offer the prospect of improving global supply chains.

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To date, however, the WTO has not been pursuing negotiations on logistic services and related government policies that affect the operation of supply chains. More progress in this direction has been made in recent regional negotiations such as the Trans-Pacific Partnership talks. There, business was arguing for a focus on the elimination of barriers to trade and redundant regulation; efforts to enhance cross-border physical connectivity; and to improve communication on and coordination of regulatory practices that impact on trade.

A major element of the proposed approach in the TPP is consultation and collaboration – regular communication among officials, regulators and industry representatives, with a view to identifying issues and potential solutions and monitoring progress in reducing needless policy-created supply chain costs. Cooperation needs to centre on: attaining specific performance targets (e.g. time-to-release commitments and a common list of data elements for consignments); agreeing on regulatory principles; establishing consultation processes that allow industry to identify specific chokepoints and mechanisms to address these chokepoints in a timely and collaborative manner.

These new approaches towards international cooperation to reduce the costs of trade and the efficiency of supply chains are very desirable and could be pursued at both the regional and multilateral (WTO) levels. As a precondition, industry needs to engage more with governments to identify the set of policy areas that matter most and to engage in the process of monitoring implementation. Ultimately, any supply chain will have common features and unique characteristics. Analysts of trade agreements often stress that these, by nature, are “incomplete contracts”, i.e. that it is impossible to specify all the elements that can affect an issue. It is critical therefore to agree to not only pursue a comprehensive approach spanning the major policy areas that affect the supply chains and related performance indicators, such as targets for average clearance times. It is also necessary to establish mechanisms for close and regular interaction between governments and those major business stakeholders that operate or depend on supply chains, so as to identify and assess chokepoints as they arise. One must also consider, in a cooperative manner, how to

deal with excess costs associated with the differences in regulatory regimes.

An important question is whether such approaches are best pursued at the global level or within smaller groups of countries. Bottlenecks may be very specific to supply chains – for example, automotive chains are very different from those of textiles – and the political economy forces that drive policies are likely to differ with the level of logistics performance and the trade potential implied in the short- to medium-term. Thus, a differentiated approach is required.

While international cooperation to improve the operation of supply chains matters, there is much that national governments can and should do to improve the logistics environment in their countries. The very large differences in logistics performance that are documented by the LPI are mostly a reflection of domestic factors that can be addressed by each country individually. As discussed further in World Bank (2012), the progress that has been made by a country such as Morocco in facilitating trade and improving logistics illustrates that the payoffs, in terms of attracting supply chain-dependent manufacturing investment, can be substantial.

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- Bernard Hoekman**
Director, International Trade Department,
World Bank, Washington DC

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The Panama Canal Expansion and its Impact on Global Trade

Five years ago, after detailed and lengthy study and consultation, the Panama Canal Authority (ACP) started physical construction on its expansion project, a development that will change the landscape of the country and the way that goods move around the world. The expansion is a US\$ 5.25 billion undertaking that includes the construction of a third lane of traffic, in parallel to the two existing ones. When opened, it will double the capacity of the Canal.

Once the new lane is operational, the ACP will be able to handle vessels of 160 feet in beam, 1,200 feet length overall (LOA) and 50 feet deep, with a deadweight tonnage of up to 170,000. Soon, containerships deployed through the waterway will be able to carry three times more than those that transit at present. Capacity will increase from 4,400 twenty-foot equivalent unit (TEU) to 13,200 TEU. Dry bulkers and tankers will be able to carry twice the tonnage allowed in the Panamax-size vessels currently trading within the Canal routes. All in all, this development will provide economies of scale and cost reductions along the supply chain – especially for shipping lines and shippers – as well as growth opportunities for ports and areas that are the origins and destinations of cargo.

For the shipping lines, the expansion will result in operational efficiencies, improved vessel utilization and fuel efficiency as the use of larger and probably newer ships is likely to reduce the fuel cost and CO2 emissions associated with each voyage. The expansion will allow shipping lines to maximize the efficiency of their fleet, improving their competitiveness and bottom line.

Over 14,000 vessels loaded with more than 200 million long tons of cargo transit the Panama Canal each year. Nearly 40% of the cargo moves in the trade lane that joins north-east Asia to the ports in the East and Gulf coasts of the United States. The expansion will bring growth opportunities to those ports along these coasts that are equipped to handle larger ships, where there are rail and road connections to ship cargo inland and distribution centres for the storage of merchandise. More jobs related to supply chain activities are likely to be created in the states where these ports are located. The value of the land may also rise as the need for distribution centres increases.

Most ports in north-east Asia can handle the largest container vessels and are already doing so. However, ports on the East and Gulf coasts of the United States present a different picture.

Norfolk, Virginia, with its numerous, 50 ft. draft distribution centres in the area and rail connectivity up to Chicago through Norfolk Southern, is ready to handle the largest ships. Up north, the Port of Baltimore is investing US\$ 120 million in deepening its berth. It will be ready for the new, larger vessels this summer.

The Port Authority of New York & New Jersey is deepening its draft from 45 to 50 ft. By the end of 2012, all New Jersey container terminals will have 50 ft. draft, and by 2014, the deepening process at all terminals will be complete. Post Panamax vessels already call at NY/NJ. Bigger ships, however, can only call at Global Terminal, as the others are restricted by the height of the Bayonne Bridge. The Port Authority has a one billion dollar-project to raise the roadbed of the bridge by 2016.

By 2014, the Port of Miami will be ready with a 50 ft. draft, a tunnel to expedite the shipment of goods to the South Florida region, and adequate rail connections through the Florida East Coast Railway that links with the US freight network via CSX and Norfolk Southern at Jacksonville.

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Ports like Savannah and Charleston are also advancing projects to deepen their drafts. Savannah recently received the approval of the Corps of Engineers to deepen its draft to 47 ft. Charleston already handles Post Panamax vessels deployed through the Suez route and is in the process of obtaining the Corps' approval to deepen to 50 ft. In the Gulf region, the growth prospects for the Port of Houston are promising. The port has a 45 ft. draft, huge distribution centres and a population of six million expected to double by 2035. To summarize, several US ports are looking forward to capitalizing on the Canal expansion.

In addition to significantly improving the existing and beneficial trade routes, the Panama Canal expansion will open new trade routes and foster exports.

The ACP foresees the deployment of specialized Liquefied Natural Gas (LNG) vessels that cannot transit through the Canal today as they are too big to fit the existing locks. The waterway will become a new competitor for LNG cargo moving from Peru to Europe and for shipments travelling from Trinidad and Tobago, in the Caribbean, to Chile. There is also a potential trade in LNG, emerging from the expanding US shale gas industry, destined for Asia. The ACP is closely monitoring these developments and actively studying and planning to meet the requirements of this specialized trade.

The expanded Canal will allow the transportation of grain in 100,000 deadweight tonnage vessels. Approximately 40 million metric tons of grain, particularly soybeans, corn and sorghum, are transported annually by barge across the Mississippi to ports on the Gulf Coast. From there, they are transported in dry bulk vessels to Asian markets, via the Panama Canal. The savings from using a larger vessel could amount to six dollars per ton. There is also a potential for soybean shipments originating in the north-east of Brazil with destination Asia.

Colombian exports of coal and iron ore could also be shipped through the expanded Canal in Capesize vessels of 175,000 deadweight tonnage. It is expected that in the next ten years, coal exports from Colombia will increase by more than 200 million tons. There is also a potential trade in iron ore shipments originating from Venezuela and Northern Brazil; however,

these would likely be shipped in Panamax-size vessels, due to draft limitations in ports of origin.

One of the greatest impacts on Panama will be the expansion of its ports system. Its volumes are expected to increase from 6.5 million TEU in 2011 to over 12 million in 2020. Around 85% of the containers currently handled are trans-shipped to Latin American and Caribbean markets. In the future, Post Panamax vessels are likely to be deployed on the long hauls from Asia to Panama. Feeder vessel networks will then distribute the cargo over shorter distances from Panamanian ports to the rest of the Americas.

Today, Panama is the premier trans-shipment hub for the Latin America and Caribbean region. The country's efficient transportation platform complements the Canal transit service and allows the movement of cargo by water, rail, road and air. A cluster of transportation and logistics-related activities facilitate transactions. These activities include a free zone, logistics parks and solid banking and insurance sectors.

According to the International Monetary Fund, growth prospects for the region will be around 4% in the coming years. Bolstered by the recent US-Panama Free Trade Agreement, this will strengthen the country's position and consolidate Panama as the Gateway to the Americas.

Rodolfo Sabonge
Vice-President, Market Research & Analysis,
Panama Canal Authority, USA

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Several US ports are looking forward to capitalizing on the Canal expansion.

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Logistics Clusters: A Growth Engine

Governments around the world are investing significant resources in developing logistics clusters: agglomerations of logistics service providers and business logistics functions of shippers.² Such clusters are supported by significant infrastructure investments in ports, airports and intermodal yards, as well as water, rail and highway connections. In many cases, the investments are made, in part, by real estate developers. Such developments are prevalent in the developing world as well as in Europe and North America.

Logistics Clusters around the World

Leading logistics clusters include: Singapore, with its leading ports and airport; the Netherlands, in particular the corridor from Rotterdam to Brabant, Breda and Fresh Park Venlo on the German border; and the Los Angeles basin, including the Los Angeles/Long Beach Ports, Los Angeles International Airport and the surrounding logistics infrastructure from south-east Los Angeles to Orange County and John Wayne Airport and from Anaheim and the Inland Empire, including Riverside, Ontario (with its airport) and San Bernardino. Other leading logistics clusters include south-west Tennessee (anchored in Memphis); north-east Illinois (anchored in the Chicago area); Dubai; São Paulo; Aragon in Spain; and dozens of locations in China.

The terms used to describe such agglomeration of logistics activities vary. They are called “logistics parks” in the United States and China; “transport centres” in Denmark; “logistics platforms” in Spain; “freight villages” in Germany (Güterverkehrszentren); “distriparks” in India; and “logistics centres” elsewhere. For example, the term “aerotropolis” refers to an economic region comprising aviation-intensive businesses clustered around a major airport.

Aerotropolis regions can be found in many places, including: Memphis Airport; Schiphol, Amsterdam; Hong Kong International Airport; Frankfurt am Main Airport; Shanghai Pudong Airport; Incheon International, Seoul; Jaipur Airport in India; Indianapolis International Airport; and Louisville Airport, Kentucky.

² Shippers include beneficial freight owners, such as manufacturers, retailers and distributors.

Logistics Cluster Growth

Many authors have enumerated the advantages of industrial clustering and their research focuses primarily on high-technology clusters, such as Silicon Valley or “Bio-Cambridge”, in Massachusetts. The advantages of industrial clusters include: trust and tacit knowledge transfer among cluster denizens; explicit business collaboration; joint lobbying for government resources for the cluster; moving suppliers, including educational and research institutions, into the cluster; the availability of labour and expertise; and resources for new company formation.

Logistics cluster, exhibit further advantages rooted in the economics of transportation, including:

- Economies of scope – the presence of many shippers provides opportunities for balanced movements in and out of the cluster, avoiding equipment idle time and empty repositioning moves
- Economies of scale – more logistics activities in the cluster create higher freight volumes, allowing carriers to use larger conveyances and enjoy higher utilization, leading to lower costs
- Economies of density – as the number of companies in the cluster grows, pickup and delivery operations are more efficient
- Better service – as the freight volume grows, the frequency of transportation services in and out of a logistics cluster increases
- Price stability – often referred to as “liquidity”, this is the result of many shippers in the same geography and served by many transportation carriers minimizing situations of short-term mismatch between demand and the availability of equipment

All these circumstances create a positive feedback loop: the more companies join the logistics cluster, the lower the transportation costs and the better the service. This attracts more companies to the cluster, further reducing costs and improving the transportation services.

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Jobs

Regional governments pursue logistics clusters, because they lead to economic growth and jobs. Knowledge-based clusters pursued by governments around the world tend to favour highly educated employees. For instance, information technology clusters favour those with college and post-graduate education in computer science while offering comparatively meagre opportunities for unskilled labour.

In contrast, logistics clusters offer a broad spectrum of employment opportunities: blue collar, white-collar and no-collar jobs. Moreover, these clusters provide social mobility, because the logistics industry values solid operational experience “on the floor”, even among its executives. Thus, many logistics firms promote from within the company and within the industry, while providing educational opportunities to employees who wish to improve their skills, certifications and degrees. For example, the Memphis International Airport is responsible for 220,000 jobs in the local economy, 95% of which are tied to cargo operations. The airport provides more than one out of three jobs in the metro Memphis area.

Other Advantages of Logistics Clusters

Logistics clusters also offer opportunities for new business formation. This is because many of the activities in logistics depend on coordination rather than expensive assets. The Miami Super Pages listed no less than 946 freight forwarding companies in the area, with new ones appearing seemingly every week. In October 2011, an article in The Miami Herald reported that “hundreds of small trade logistics companies give South Florida a competitive edge in international commerce as a ‘one-stop-shop’ for companies moving products and improving their supply chain.”

Logistics clusters attract other economic activities and their associated jobs, in several ways. First, it is economical to perform value-added operations on products “while they are there”, since this saves transportation expenses. Second, logistics clusters are natural locations for postponement and late customization activities, as this is the last location of the products before they are moved to the retail and distributors’ supply chains. Third,

logistics clusters are natural locations for handling reverse logistics for returned products. Such products can be tested, refurbished and moved back into the supply stream of original products, without requiring new distribution channels. Finally, logistics clusters are natural locations for manufacturing sites, because of their cost effective and frequent multimodal transportation offerings. Such services allow manufacturers to move raw material and parts inbound and to distribute the finished products efficiently.

One of the most attractive features of logistics clusters for the governments of developed countries is that they are not “offshore-able”. Due to the timing and economics of transportation, distribution is always local and the work cannot be performed in developing countries. In addition, logistics activities support a wide variety of industries. Consequently, the work in logistics clusters is not vulnerable to the vagaries of a particular industry, in the same way that, for example, Silicon Valley rode high during the dot-com boom and crashed only later. Naturally, such clusters are vulnerable to general recessions, as is the rest of the economy.

Environmental Considerations

Most air quality standards define a threshold concentration of pollutants. For this reason, an area with a concentrated source of pollution (e.g. large numbers of trucks, airplanes, barges or ships in a logistics cluster) is more likely to violate pollution safety thresholds than an area with more dispersed logistics facilities. Similarly, the clustering of transportation terminals and distribution centres may imply circuitous transportation routing and more miles travelled, as compared to travelling directly from origin to destination. At first glance, logistics clusters seem to be major polluters and less clustered freight transportation operations appear environmentally preferable. A more systematic analysis, however, leads to the opposite conclusion.

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The correct metric for energy consumption is not the fuel consumed per conveyance movement or the number of miles travelled, but the fuel consumed per shipment moved. Logistics activities gravitate to clusters so as to improve efficiencies and reduce costs. The costs of operating vehicles, especially fuel, dominate the cost-calculus of transportation decisions. The act of determining how to move the greatest total volume of goods at the lowest cost is likened to minimizing the carbon footprint of trade. Minimizing fuel per shipment requires consolidating to larger conveyances, i.e. clustering. Moreover, clustering creates higher freight volumes on hub-to-hub lanes, enabling the use of more fuel-efficient modes such as rail, barge, short sea and pipelines. Accordingly, because of the poor utilization of conveyances and the use of more, smaller and less efficient conveyances, ultimately a non-clustered logistics network causes higher total fuel consumption, in terms of fuel per ton-mile hauled.

Thus, while logistics clustering generates less total pollution, its pollutants are concentrated and increase the health hazards around such clusters. The result is a trade-off between the local and global benefits of logistics clustering. In the long run, many green innovations in vehicle technologies and operating processes – most of which are developed by, in and around logistics clusters – are likely to be deployed in these logistics clusters, ultimately mitigating the effects on the local environment.

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Perspectives on the Global Container Shipping Industry

The global container shipping industry is arguably one of the most critical links in the expansion of trade and global supply chains. Since its beginning in 1956, global container shipping industry has revolutionized the movement of international trade.

The health and success of a particular industry can be defined by many parameters. If growth and profit are the key measures of health, the global container shipping industry is in a very distressed state. With volatility at an all-time high, evidence points to one conclusion: perhaps it is time for the global container shipping industry to revisit its strategy and consider a new approach. For nearly 50 years, Wal-Mart has climbed the ranks of global retailing by employing an Every Day Low Price model. While the two industries are worlds apart, there are, however, several important similarities. Both industries are competitive, capital-intensive and highly fragmented.

At present, the global container shipping industry relies heavily on a spot market pricing model, inducing periods of “feast or famine”. When demand is high, so are prices and the resulting profits are invested in new ships. When the demand is low, prices drop rapidly, coinciding with new vessels entering the market. This results in a volatile and unpredictable cycle, causing instability in the freight market and dampening global trade growth.

According to recent reports, the global container shipping industry recorded a US\$ 6 billion+ loss in the third and fourth quarters of 2011. In 2009, losses were even larger, collectively costing the industry an estimated US\$ 20 billion. Throughout 2009, many ships were left idle (with a total carrying capacity of more than 1.4 million TEUs, at peak) as a way to deal with the massive oversupply of capacity while carriers continued to take deliveries of new builds.

The year 2010 marked a return to profitability as the markets tightened in key lanes where supply and demand reached and then surpassed equilibrium. Profits across the industry nearly exceeded losses in 2009, but one year of profitability cannot offset two years of substantial losses.

The cycles of supply and demand driven by a spot market mentality is out of control. These continued periods of instability have left many industry experts asking the same question: What if the global container industry implemented a paradigm shift and moved from a spot market pricing model to a more consistent, efficiency-based model, one focused on the needs of the customer? Such a model could moderate cycles of extreme volatility. An efficiency-based model calls for carriers to operate for less, thereby allowing them to “sell” for less, in order to ultimately grow profits. Wal-Mart calls this business model the “productivity loop”. Keeping their customers as the central focus, Wal-Mart continuously strives to introduce efficiencies across the business to operate for less, buy for less, sell for less and grow sales to maintain their commitment to Every Day Low Prices.

Initiating a paradigm shift calls for understanding and self-control. In the current supply and demand model, the idea of control seems to revolve around negotiating the rate – the higher the demand, the higher the rate, the greater the profit. But this type of control is undone by the fact that the market will swing, demand will fall, and profits will turn into losses. One can attempt to control costs by developing long-term efficiencies that would be maintained through the highs and lows of the market. Such a strategy could help to stabilize the industry, fostering growth and profitability. Carriers should draw upon efficiencies to cut their bottom line expenses and drive down costs.

With rates steadily declining for nearly 16 months, carriers have reached an almost intolerable point. They can no longer afford to move cargo at such low rates with costs continually rising in order to keep utilization high. While shippers understand the financial position of the carrier, they can no longer tolerate steep rate increases without a guarantee for improved service.

Growing increasingly frustrated with the volatility of the global container shipping industry and the cost it passed along to their customers, Wal-Mart altered their service contract structure in the late 1990s. The company was able to focus on controllable factors to align with carriers that shared common ground. This change in philosophy allowed Wal-Mart to modify the terms of service contracts, emphasizing transparency, an end-to-end

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supply chain focus and taking a long-term approach to ocean contracts. Additionally, Wal-Mart made forecasting a priority, as it was identified by carriers as a huge cost driver. After developing annual forecasting measures, Wal-Mart honed the process to monthly, then weekly, forecasts. Finally, the company developed an eight-week rolling forecast, which is 95% accurate.

While forecasting measures can be of benefit to both the shipper and the ocean carrier, unless the industry takes a more customer-centred approach, such efforts will be nullified. Further to this, carriers need to determine who their end-customer is. Is it the shipper or the individual purchasing the goods? The global container shipping industry tends to offer new services rather than ask the customer what services they need. Therefore most shippers are left crying out for more open lines of communication not solely fixed on rates. Shifting the focus from rates to the customer's need will help control costs, thereby moderating volatile cycles and allowing shippers to commit to more long-term business. To achieve this, contract negotiations need to focus more on how carriers can serve the customer in the total supply chain. Shippers are concerned about on-time reliability improvements and efficient management of ship capacity, in addition to fluctuating rates.

Moreover, once the kind of service required is determined, the quality and consistency of it should become a priority. The industry is characterized by a lack of reliability, by frequent service changes and poor communication; weaknesses that frustrate shippers engaged in global commerce. Poor communication between shippers and carriers leads to enormous waste in the industry. While carriers need to communicate service changes as far in advance as possible, shippers need to improve the reliability of their forecasting. Ocean carriers are usually only one link in the supply chain for a particular cargo and should aspire to provide the best possible service with the lowest prices.

With all of this in mind, the deep-sea container industry has made an effort to improve the situation. Recently, new and larger ships were introduced to help reduce slot costs. However the presence of these new ships has driven utilization down, thereby unsettling the market and negating some of the benefits of the new ships. Injecting more vessels into an already flooded market with slow demand growth is likely to lead to a further price competition. While the idea of designing and building new, more energy-efficient ships was a step in the right direction, the business model behind them was rate- and profit-driven. At this point, carriers will need to manage the capacity they have and use it efficiently in order to justify rate increases. There seems to be a disconnect between the carrier and the shipper; in order to close the gap, the industry needs to develop a mindset that is more efficient, customer-centred and service-based, and less preoccupied with negotiating rates.

As with any change, this will take time. There is no quick-fix solution. Carriers and shippers alike must agree that the industry should no longer continue down a path of instability and volatility. Over time and with discipline, the stability of an efficiency-based model has the potential to ensure the long-term health of the global container shipping industry. With increased communications between the shipper and carrier and a shift to a more customer-centred model, a more stable industry could emerge to support the future growth of global trade.

Rob Kusiciel

Vice-President of Inbound Transportation and Global Logistics, Wal-Mart, USA

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The Container Shipping Industry: Global Trade's Weakest Link

As indicated in the previous article, the container shipping industry is showing symptoms of becoming unhealthy. The big questions are: How did the current condition of the industry come to be? And what can be done about it?

The concept of shipping containers is attributed to Malcom McLean. The idea came to him in the 1950s while he was waiting for his truck to be unloaded onto a ship. He thought there should be a way to do it in hours, rather than days. His vision of speed and efficiency – one that motivated the development of cellular ships, land-based container cranes and faster container ships, and enabled the revolution of global trade – is being ignored by the shipping lines. The huge container ships brought on-line take days, not hours, to load or unload and shipping lines have slowed down their ships dramatically. While it is generally agreed that speed and timely service at predictable cost are essential, the actions of the shipping lines are not always in line with these needs. As indicated by Rob Kusiciel, the disconnect evident between shippers and carriers does not bode well for international trade.

From 2002 to 2008, global trade grew at a roughly linear rate of about US\$ 1 trillion per year. Most of this trade is transported on container ships. Believing this growth would continue, shipping lines were motivated to increase capacity so as to retain or increase their market share. Because bigger ships are somewhat more cost-effective to operate (estimates of cost reductions per slot of 10,000 TEU ships over 4,000 TEU ships vary from about 8% to as much as 30% on long hauls), the lines placed orders for increasingly larger ships. Little analysis was conducted to determine the impact these ships might have on the needs of shippers. The focus was on the single dimension of cost per container slot, assuming very high use of the ships. The economic recession then caused global trade to decrease from more than US\$ 15 trillion in 2008 to less than US\$ 12 trillion in 2009. This 20% decrease meant that there was about 20% more container line capacity than needed. Despite trade increasing in 2010 and 2011, it still remains well below what was expected before 2009.

Since very big ships are only practical on very high volume lanes, the carriers faced a combination of excess capacity and limited flexibility regarding where the ships can be assigned. As excess capacity tends to lower prices, the carriers looked for ways to reduce their capacity. Being reluctant to render the big ships out of service, many lines resorted to “slow steaming”.

Modern container ships are designed to run at top speeds of about 25 knots. Slow steaming reduces their speed to about 20 knots and fuel consumed per mile is reduced accordingly. A 20% reduction in speed decreases fuel consumption by about 40%. Slow steaming thus reduces carbon emissions per mile. Given the current period of overcapacity, slow steaming is beneficial to the container shipping lines. It reduces cost and capacity and is better for the environment. In many cases, reduction in carbon emissions is provided as the motivation for slow steaming.

Slow steaming is not beneficial for the shippers, however, since slowing the speed by 20% increases transit time and in-transit inventory respectively by 20%. Since the amount of in-transit inventory is directly proportional to time in transit, increasing transit time by one day increases the shipper's in-transit inventory by one day too. For more expensive products, the increase in inventory cost is significantly higher than the savings in fuel. To make matters worse, many container shipping lines are adopting “super-slow steaming” at speeds of 12 knots or about 14 miles per hour. This more than doubles the in-transit inventory, compared to when running at 25 knots. As indicated by Kusiciel, this strategy worked for the container lines in 2010 to offset losses incurred in 2009. However, the industry's US\$ 6 billion loss at the end of 2011 and the fact that slow steaming is detrimental to shippers indicate that the strategy is not sustainable.

The increasing number of big ships coming on-line provides a particularly challenging set of issues. The total current container fleet contains almost 5,000 ships with a total capacity of almost 16 million TEUs. Almost 3 million TEUs of this capacity is from the “super-Post Panamax” ships (i.e. those with more than 8,000 TEU capacity), with another 2.5 million TEUs on order. There is no apparent place to profitably assign these big ships. Almost 70% of the existing super-Post Panamax ships are on Asia-Europe routes and given economic conditions in Europe, these lanes are unlikely to need more big ships.

There is a lot of discussion regarding using the big ships between Asia and the East Coast of the United States after the Panama Canal Expansion in 2015. However, currently the biggest ships that can transit the Canal are less than 5,000 TEUs. It seems unlikely that there will be sufficient freight increases to justify ships almost twice as big by 2015. Further complicating the assignment of big

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ships on these lanes is that only Miami and Norfolk on the East Coast have the depth to easily handle them.

Even when volumes are insufficient to justify the big ships, the advantages for shippers remain few. With lift rates at about 30 containers per hour for a container crane, it takes many days to unload big ships, particularly those with 18,000 TEU capacities. Uncertainty about the number of days required for a container to be delivered forces shippers to hold more safety stock. Additionally, in order to be cost-effective, big ships need to make fewer port calls. This forces shippers to move freight by more expensive land transportation from the ports of call of the big ships. Finally, given the financial condition of the container shipping industry, it seems unlikely that the cost savings from using big ships, if there are any, will reach the shippers.

Unless the global economy recovers rapidly, the new big ships coming on-line will add to the current overcapacity and are likely to increase financial pressure on container lines. An obvious concern is the impact, if one or more of the big lines were to fail. The 15 top global container fleets have a 70% share of total capacity. With today's lean supply chains, disruption – even for short periods – has major repercussions down the chains. It is unclear whether measures in place are adequate – to get in-transit containers delivered on time and thereby avoid major supply chain disruptions – should a major shipping line go out of business. Another concern is the measures container lines are taking to re-establish profitability and their impact on supply chain effectiveness.

The one possible silver lining of the current environment, from the shipper's perspective, is the visibility given to the need for improved service. Maersk has been the leader in pointing this out in the publication of the Maersk Manifesto: http://www.changingthewaywethinkaboutshipping.com/html/pdf/Maersk_Manifesto.pdf.

Maersk reports that currently only half of containers are delivered on time. They recognize the delays caused at ports because of the typical weekly service. To overcome this, they have instituted a daily service between Asia and Europe to reduce the time containers are kept waiting at ports and to guarantee a specified service level, similar to that offered to small package providers (such as UPS, FedEx and DHL). While this service does not minimize transit

time as it does for small package providers, it is a move in the right direction. A major hurdle to better service is that it is easier to implement with smaller ships rather than bigger ones.

To conclude, the current status of the container shipping industry should be a cause for concern for all stakeholders in international supply chains. The industry has been slow to recognize and react to shipper needs for speed, dependability of service and predictable costs. The forecasts for increasing demand were overly optimistic in light of the decline in trade in 2009. The rush to buy the very big ships seems questionable even in the best of times. While the bigger ships are somewhat cheaper for the carriers to operate, they lead to less service quality and more inventory cost for the shippers. The disconnect between the container shipping industry and their customers is likely to continue and could be a contributor to the shift towards more regional rather than global trade. The potential for at least some of the shipping lines to fail in this environment seems worthy of note. Shippers should be careful to understand the financial strength of their carriers and not just rely on third parties to get them the best rates.

While the Wal-Mart approach noted by Kusiak, of keeping customers as the central focus and striving to increase efficiencies across the chain in order to reduce costs for the end customer does not yet seem to be on the horizon for the container shipping industry, Maersk's advocacy for better service is encouraging. Service and cost would be improved by better cooperation among the container lines, sharing containers and moving towards hub-based networks like those of the small package industry. By including more feeder services to smaller ports, the hubs could utilize the big ships more effectively on long hauls and small ships on feeder lanes. They could also justify daily services for smaller ports. For regions like Latin America, better service and connectivity have the potential to increase trade significantly.

Hugh Donald Ratliff
Regents Professor and Executive Director,
Supply Chain & Logistics Institute, Georgia
Institute of Technology, USA

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Measuring Carbon Emissions from Supply Chains: Getting the Level Right

The maxim, “If you don’t measure it, you can’t manage it” applies just as much to carbon emissions as to any other business metric. Companies need to understand the profile of emissions across their production and distribution operations to know where to target their carbon reduction efforts. This understanding is improved by disaggregating the emissions data to the level at which key factors influencing the company’s carbon footprint can be studied. Just as activity-based costing drills down in financial terms to find the cost drivers, so environmental assessments need to determine the corresponding drivers of carbon emissions. Indeed, given the close correlation between cost and carbon, these two sets of drivers are often very similar.

The pressure to drill statistically into a company’s carbon emissions has not only come from managers trying to find new sources of eco-efficiency. It has also been motivated in some sectors by a desire to put carbon labels on consumer products. This is seen as a way of getting citizens more actively involved in the effort to cut carbon emissions.

The logic was neatly summarized by Sir Terry Leahy, [1] former Chief Executive, Tesco, United Kingdom, in a speech made in Beijing in 2008: “Consumers account, directly and indirectly, for 60% of carbon emissions. Get the consumer onside and the task of tackling climate change becomes possible. Imagine if people acted to cut carbon in all they did, the supply chain and gradually the economy as a whole would begin to turn to green. We will begin to create a mass movement in green consumption.”

In this newly carbon-conscious world, consumers are scrutinizing product packaging for information about the amount of embedded carbon and are demanding lower carbon brands. Daniel Goleman argues: “When the ecological impact of goods remains invisible, merit goes unrewarded.” [2] Carbon transparency at a product level, so the argument goes, would offer marketing benefits to those companies with carbon-efficient production and logistics systems.

What evidence is there, however, that carbon labelling would induce a large enough shift in consumer behaviour to justify doing it? The short answer is precious little. Recently published research [3] concludes: “The evidence from the pro-environmental behaviour literature, from focus groups held for this study and from other studies of carbon labelling, is that only a very small percentage of shoppers can be expected to make substantial use of carbon labels.” PepsiCo, which conducted one of the first trials of product carbon labelling in the United

Kingdom, claimed recently they had not seen the take-up they would like”. [4]

The consumer response to carbon labelling may be greatly reinforced at some time in the future by legislation requiring citizens to stay within an annual quota of carbon emissions and introducing a personalized cap-and-trade system for these emissions. This is not as fanciful an idea as it may seem. In 2008, a UK Parliamentary Inquiry concluded that “personal carbon trading could be essential in reducing our national carbon footprint”. [5] A prerequisite for such a system would be a comprehensive carbon analysis of every product and service releasing GHGs at some stage in its production and delivery. That is where the real problems would arise, because so much of what we now consume moves through complex supply chains that span the globe and comprise numerous companies.

Back in 2007 and 2008, several government and industry bodies and major corporations around the world were heavily promoting the concept of supply chain carbon measurement at a product level. The Carbon Trust in the UK, ADEME in France, the Öko-Institut in Germany, METI in Japan and the Korean Eco-products Institute conducted studies and ran trials with sample products. The Carbon Trust, jointly with the British Standards Institute (BSI), devised the Publicly Available Specification (PAS) 2050 methodology and standard for assessing the “life cycle greenhouse gas emissions of goods and services” which has since been adopted in other parts of the world. [6]

Tesco made a commitment to carbon label its entire product range of 70,000 stock-keeping units (SKUs), while Wal-Mart went further and promised to assign all of its products a “sustainability index”. Product-specific GHG-emissions would be one of many externalities factored into Wal-Mart’s composite index of sustainability. This was deemed a “sound idea” in an editorial in The New York Times, on 6 August 2009.

Universities were beneficiaries of these corporate commitments as companies sought the advice of academics on how to deliver on these environmental promises. Tesco, for example, invested £25 million in a Sustainable Consumption Institute at the University of Manchester, while in the United States, Arizona State and the University of Arkansas received several million dollars from Wal-Mart to establish a Sustainability Consortium.

Early pilot projects, however, began to reveal just how much time, effort and money it required to analyse supply chain GHG emissions with sufficient accuracy to

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permit product labelling. Several companies reported spending £25,000 to £30,000 per SKU to obtain the necessary data. This was mainly for basic grocery or health and beauty products with relatively few ingredients and simple supply chains. SKU-level carbon footprinting of the much more extensive and intricate supply chains of products, such as cars and computers, would require a vast investment of corporate resources and levels of inter-company collaboration and data-sharing way beyond current practice.

Lynas [7] observed: “To figure out a carbon label for every product on the shelf would be a task of labyrinthine complexity and monumental cost.” This cost would be inflated by the need to verify the quoted carbon figures, because if labelling influenced products’ market shares, which after all is its *raison d’être*, companies would be inclined to under-report the values.

Given its product focus, this system of carbon auditing would probably have to be more elaborate than the systems currently in place for corporate financial auditing. The Carbon Trust, for example, noted a major business opportunity in providing “independent certification” of carbon labels for several thousand British pounds per SKU. Although this analysis and verification would create a wealth of new business and job opportunities, it would probably do little to address the problem of climate change. Would it not be better to invest these resources in actual carbon-saving initiatives?

By 2010, only around 1% (by value) of retail food and drink products in the United Kingdom carried a carbon label.[8] When I published a paper[9] that year challenging the feasibility and desirability of product-level carbon measurement and labelling, it received a mixed reaction. It gained a positive response from senior executives in several major fast-moving consumer goods (FMCG) manufacturers that had experience of the practice. Some feared that major retailers might pressurize them into carbon footprinting their product ranges at great expense and minimal environmental benefit. Representatives of some environmental organizations, on the other hand, suggested that I was exaggerating the analytical difficulties and under-estimating the benefits of carbon labelling.

Two years on, a new mood of realism has dawned with many of the early enthusiasts for product-level carbon measurement now conceding that it is not practical, not cost-effective and unlikely to induce the desired shift in consumer demand. In January 2012, Tesco announced it was abandoning the carbon labelling of its product range as it was

too “time-consuming and expensive”.[10] It has been taking a “minimum several months per product” to do the necessary analysis. At its recent carbon footprinting rate of 125 products per annum, it would take Tesco 560 years to carbon label its entire range. Wal-Mart has also been finding it very difficult to fulfil its pledge of putting a Sustainability Index on its products. [11]

It has been suggested that, even if the goal of carbon labelling is abandoned, it may still be beneficial to measure supply chain carbon emissions at a product level for two reasons: to permit “choice editing” and to support internal decarbonization efforts. Choice editing allows company buyers to exclude products with relatively high levels of embedded carbon from the range. Carbon information then influences demand at the corporate buying level rather than at the final point of sale to consumers. It is very doubtful, however, that the benefits of carbon-sensitive choice editing would outweigh the high costs of SKU-level measurement. The same applies to internal decarbonization initiatives. These can be effectively designed and implemented on the basis of higher level carbon calculations.

This retreat from the carbon footprinting of individual products should not be construed as a rejection of the need to measure GHG emissions from supply chains. It is merely a recognition that this level of carbon analysis is generally inappropriate. The need for carbon analysis at higher levels in the management of logistical systems and supply chains is as great as ever. Disaggregating carbon data by business unit, activity, facility, market segment, customer and consignment can help companies formulate decarbonization plans, furnish business clients with environmental reports and provide a basis for carbon offsetting. Such analysis still presents major analytical challenges, in the resolution of boundary issues, the allocation of shared emissions and the refinement of carbon intensity values for the broad range of activities that comprise a logistics operation.

Major efforts are also underway to standardize the measurement and reporting of logistics-related emissions at different levels of analysis and to harmonize some of the standards that already exist. So analysts in this field have more than enough work to do without becoming entangled in the minutiae of product-level carbon footprinting.

Alan McKinnon

Professor and Head of Logistics in the Kühne Logistics University, Hamburg; Chair of the Logistics & Supply Chain Global Agenda Council, World Economic Forum

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Supply Chain in a Virtual World:

Responding to Challenges and Changes in Trade Paradigms

There is an old saying: Information is power. Today, this is even more specific. Information is the power that drives business and with the tools available in our IT world, it also drives efficiency and profit.

Trade has supported the development of economies from time immemorial, from the simple bartering of surplus fish from a fisherman's catch for surplus vegetables from a farmer's harvest to the complex and sophisticated supply chain that now reaches all corners of the earth.

There have been a number of transformational developments in the transport and management of trade flows over those millennia, the most recent being the introduction of the container, some 50 years ago.

Today we are on the cusp of another transformational shift in the supply chain. While those of us involved in trade remain focused on the physical supply chain, the virtual supply chain is the way of tomorrow. The flow of information that supports the efficient management and smooth running of the supply chain across borders and around the world is defining the way the industry is run.

While 90% of the world's goods are still moved by ships and much of this handled by container terminals, the efficiency of physical connectivity to land and air routes is constrained by widespread infrastructural deficiencies. Continual improvement in the sector on sea, land and air is integral to the global supply chain. Since 1979, when Jebel Ali Port, DP World's flagship facility, opened to business, Dubai has been searching for and developing solutions to this issue.

The connectivity of authorities, banks, transport providers (including ports) and cargo owners is equally important, because no amount of efficiency in moving a container from ship to truck to road or railcar will be of use if it takes three more days to clear the necessary paperwork through customs and the bill of lading through banks. The Internet is being used increasingly to connect the supply chain community of ship operators, port operators, customs, importers, exporters, trading agencies, hauliers and logistics companies.

And where does this focus take us? For an industry known for super-sized ships, cranes and other transport vehicles, the answer lies in a very small gadget – the mobile phone. Mobile technology is now being used at Jebel Ali Port, integrating port services through the Dubai Trade portal. It has made life markedly easier for customers, saving them time and money.

At Jebel Ali, we also use technology to integrate the mobile handsets of our employees, especially at the dockyard where humans and machines are linked through simple text messages. The Labour Management System (LMS) effectively manages time and significantly reduces costs. The system, which is fully integrated with the port's advanced electronic berth planning and Gate Automation systems, determines the best labour deployment based on a forecast of variables such as vessel arrivals and gate appointments. It allows for multiple what-if scenarios that can be analysed in terms of cost and labour. It is interfaced with the Human Resources Department's time attendance readers and assigns the labour to points of work, cutting time of completing a single operation by as much as 30%. Such technology is evolving all the time. For example, we recently introduced 3G connectivity to enable container shipping lines to access bay and stowage plan information, helping them cut port call time.

Outside the port, the Dubai Logistics Corridor (DLC), which opened in 2010, is a prime example of how cargo from Jebel Ali seaport can be moved to Al Maktoum International Airport, in just 20 minutes, with customs integrated into it. The efficiency of this multi-modal logistics platform is driven by information technology. The IT eliminates paperwork and integrates various functionalities such as the visibility of inbound shipments, monitoring carrier and supply performance, automating customs entry and gate exits, maximizing yard space on wharves and slot space on ships. All this takes place without compromising the safety and security of the nation and the people.

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The DLC platform is accessed by supply chain operators through Dubai Trade, the e-service provider with a customer base of 57,000 companies and growing. Dubai Trade reports that, with 800 services, it has been recording a growth of 25.7% in total online transactions year on year. Many of its customers use the portal for 90% of their core services. The World Bank's 2012 Doing Business report commended Dubai Trade's role and placed the United Arab Emirates among the top five countries worldwide for enabling "Trading Across Borders".

Dubai Trade has delivered improvement in supply chain agility, which helped Dubai's supply chain and logistics sector emerge from the global economic slump of 2009 with great resilience. DP World's throughput, for example, returned to 2008 peak levels as early as in 2010, reflecting the return of confidence in the local supply chain sector.

Wireless adoption is growing by about 30% annually among supply chain businesses worldwide and this number will continue to be driven by the new spectrum of network services being offered to the shipping sector, according to Gartner Inc., a US-based IT research and advisory company.

The implications for trade and the supply chain/logistics industry are clear. By increasing the adaptation of IT, the supply chain and logistics sector can fast-track the integration of emerging markets into the global stream. Emerging markets, which, according to the Economist Intelligence Unit (EIU), account for 41% of global nominal GDP and where growth lies, have a huge advantage over the developed world. They haven't spent billions of dollars on wires. Their lack of infrastructure and the increasing affordability of wireless technology mean they can leapfrog to the virtual world to help drive their growth.

Figures from the International Telecommunication Union show that at the end of 2011, there were 6 billion mobile subscriptions, the equivalent of 87% of the world population and a 21% increase on subscriptions in 2009. Importantly, India and China together added 300 million new mobile subscriptions in 2010 alone, more than the total number of US mobile subscribers or indeed the total population of the United States. At the end of 2011, there were 4.5 billion mobile subscriptions in the developing world – more than three quarters of all global subscriptions.

With the functionality of mobiles to manipulate, store and process data developing rapidly, so do the potential uses of phones. The developing world has been swift to see the potential for business transactions. Industry captains need to be not only ready for the changes; they must drive them. This revolution is transforming how we conduct our lives personally and will transform our lives professionally too, as the physical supply chain is empowered and transformed by the virtual supply chain.

Al Sayed Mohammed Sharaf
Chief Executive Officer, DP World, United Arab Emirates

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Dealing with the Skills Challenge in Logistics

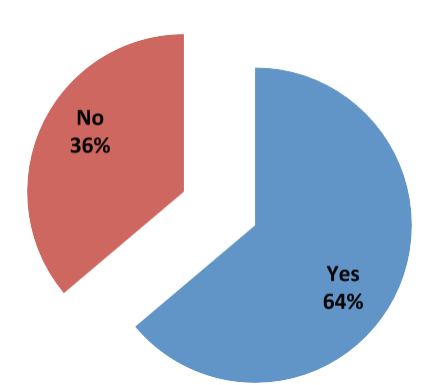
Although often overlooked, the logistics and supply chain sector underpins the entire global economy. A strong, mature and innovative industry holds together the fabric of modern life in the developed world. Moreover, it is also critical as a means to integrate emerging markets into the global trading system, thereby raising millions out of poverty.

Despite the massive investments needed in ports, airports, roads, trucks, ships and airplanes, the logistics industry is essentially a people business. It is estimated that around a quarter of all costs are staff related. It is therefore essential that the industry attract high calibre employees at all levels. In their own way, committed and high quality warehouse operatives are just as important to a successful business as experienced and qualified management.

For this reason, the Logistics & Supply Chain GAC is focusing on this important issue. Members are concerned about the difficulties of recruitment, which is having a detrimental effect on the industry and on the economy as a whole.

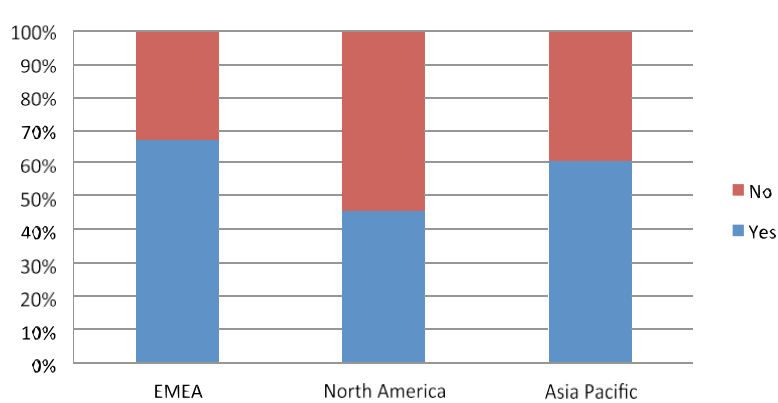
The first step has been to ascertain the extent of the problem. To do so, the industry consultancy, Transport Intelligence, managed a poll of over 300 executives, asking whether they had experienced difficulty in recruiting good employees in the past year. Almost two thirds (64%) of the executives surveyed confirmed they had experienced difficulty in recruiting good employees.

Figure 1. Have you experienced difficulty in recruiting good employees in the past year?



There were differences between regions. Europe and Asia Pacific faced the most challenges, whereas in North America, the problem appeared less acute.

Figure 2. Have you experienced difficulty in recruiting good employees in the past year?

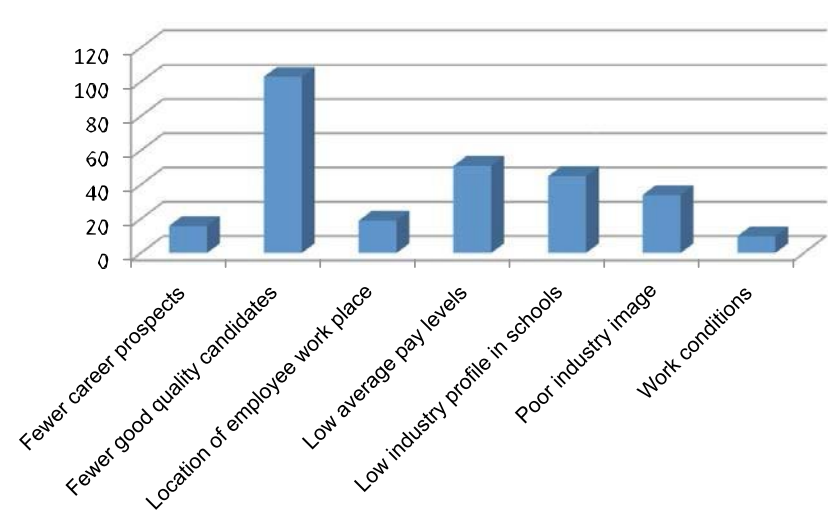


A further question probed the reasons behind these problems. The majority of respondents believed that difficulties were due to a lack of good quality candidates. Other notable reasons included low wage levels and a low profile of the industry in schools and colleges.

The logistics and supply chain sector underpins the entire global economy.

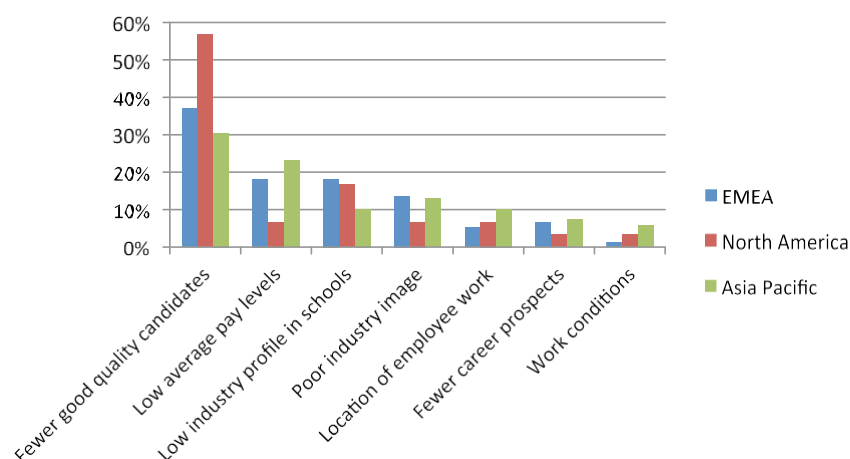
The logistics industry is essentially a people business.

Figure 3. What do you think the reasons for this are? (global sample)



Again, there were some differences between regions.

Figure 4. What do you think the reasons for this are? (by region)



In Europe, the main reason chosen was “fewer good quality candidates”, followed by “low average pay” and “low industry profile in schools”.

In Asia Pacific, “fewer good candidates” was the main reason indicated, followed by “low pay”. The third most popular choice was “poor industry image”.

The survey revealed that for North American executives, the quality of candidates is a greater problem than elsewhere in the world. Low pay, however, was not so much of an issue. Only 5% of respondents cited it as a reason why they struggled to recruit good staff.

In conclusion, the survey strongly indicates that recruiting the right levels of talent for the logistics and supply chain industry is a major problem in different parts of the world. The central reason for this is the lack of good quality candidates. This could be characterized as a “supply” issue, over which the logistics industry has little control. It is related to the quality of education and training that candidates receive prior to joining the industry and is a major issue for governments to address.

The industry can influence many of the issues identified, such as the matter of low pay. The industry needs to escape from the low pay-low quality cycle trapping it in many parts of the world. Logistics companies, their clients and governments can all play a role in this.

The industry can also work on improving its low profile in educational establishments and its poor image. Initiatives underway – such as the “Love Logistics” campaign run by the Freight Transport Association in the UK and national advertising by carriers, including UPS and DHL – may help to build a better public perception. According to the survey, far more needs to be done if the brightest candidates are to be tempted away from careers elsewhere, such as in high-tech or banking sectors.

John Manners-Bell
Editor and Chief Executive Officer, Transport Intelligence Ltd, UK

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India's Logistics Industry: Opportunities and Challenges

Logistics and supply chain management in India has been receiving greater attention in the last few years, with India's GDP recording high growths. This is not only because of vast opportunities, but also because the growth of logistics infrastructure has not kept pace with broader economic growth and warrants much needed consideration.

Growth Drivers

Acceleration in industrial production and increased consumption has resulted in high demand for basic and specialized logistics management, at local and cross-border levels. With cumulative foreign direct investment (FDI) – equity inflows from April 2000 to October 2011 valuing US\$ 226.05 billion, according to the Department of Industrial Policy and Promotion (DIPP) – there has been a major thrust on industrial production. As a result of population growth, the demand from expanding upper-middle and middle classes for basic products and services is rocketing.

According to a Cushman & Wakefield report, India's logistics industry is expected to grow at 15-20% per annum, reaching revenues of US\$ 385 billion by 2015. Demand for focused supply chain services has been fuelled by industries with a high propensity to outsource: including the automobile, consumer packaged goods, hi-tech, telecom and retail industries. The movement of basic commodities, for domestic consumption and export/import, has led to an increase in multimodal and bulk transportation and the emergence of many new ports and port-related service providers.

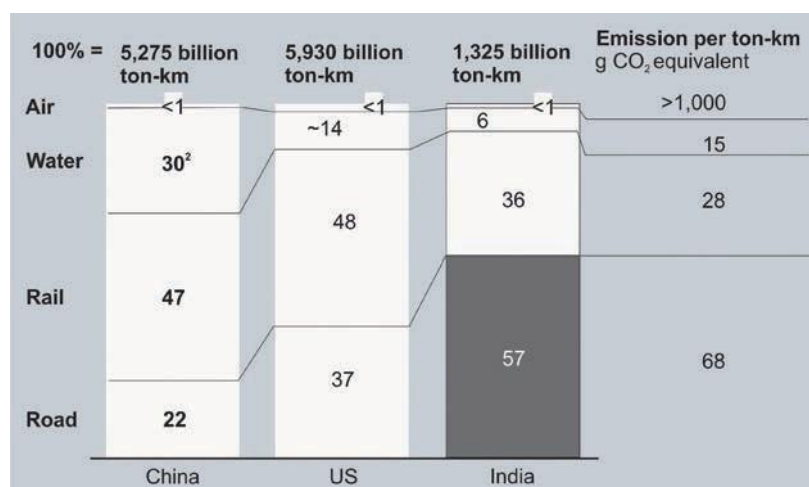
The impending change in the Indian tax system from the current state-level value added tax (VAT) to a national and uniform Goods and Services tax (GST) should help to create a national market for numerous goods and services. The logistics sector is likely to respond by making more use of hub and spoke systems, large scale warehousing and specialized services. A gradual opening up of key sectors, such as retail, aviation and defence, will be new segments for logistics companies looking to provide services right across the supply chain. Entry of multinational companies (MNCs) in sourcing, manufacturing and distributing would be other growth drivers.

Structure and Issues

India currently spends 12-13% of its GDP on logistics. For sectors moving physical goods, this percentage is much higher as 55% of the country's GDP is generated by the service sector. The industry as a whole is very fragmented and disorganized; large companies account for a small portion of the domestic transportation market share.

In India, 57% of freight ton-kms move on the road network (see Figure 1). This heavy dependence on a single mode, which is inefficient and has high carbon intensity, is brought about by deficiencies in the government-controlled railways. The rail system cannot meet the needs of industry. Indian Railways subsidizes passenger transport from freight revenue and has not invested adequately in new capacity.

Figure 1. Freight mode share¹ (percentage of ton-km)



¹ Share estimated for 2007, excluding pipelines.

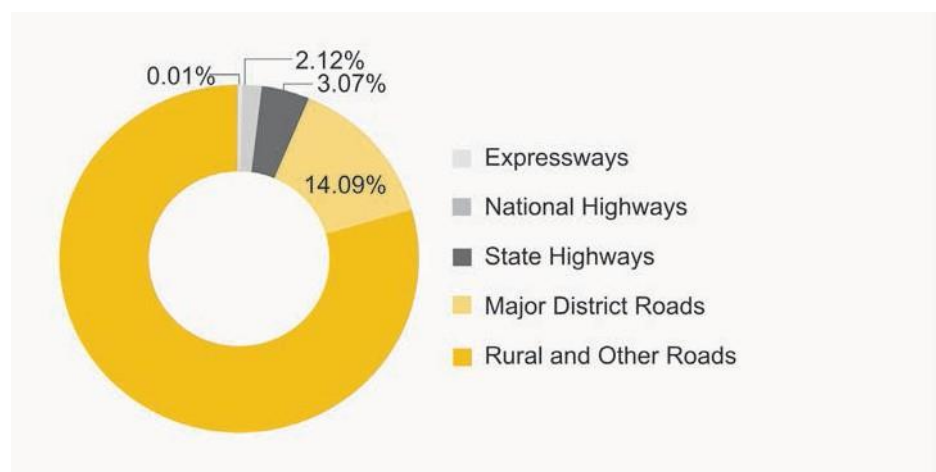
² Two thirds of this is from coastal shipping; one third is on inland waterways, mainly on the Yangtze River.

India's road network is under severe strain. National highways account for only 2% of the road network (see Figure 2), but they transport about 40% of freight tonnage. Poorly coordinated planning, intra-state border issues, cumbersome documentation, bureaucracy and corruption reduce the average speed of trucks to 21 km/hour.³ Hence a truck can cover only 300-500 km per day, as opposed to almost double that distance in larger developed countries. This renders the economy less efficient and competitive.

³ TCI-IIM Kolkata. Operational efficiencies of highway network for freight transport. 2009.

In ports, capacity and turnaround times are still well below global benchmarks. Logistics parks, warehousing and other support infrastructure are at early stages of development.

Figure 2. Road network in India



Source: NHAI

Future

In order to support the country's growing needs, the logistics industry need to act promptly on several matters. Priorities include:

1. The need for a comprehensive National Logistics policy: At present, the various components of logistics (including surface transport, railways, shipping, air, commerce and finance) are separate entities within the government, with no coordination among them. An ombudsman or an institution is needed to drive policy and changes in a synchronized manner.
2. Focused investment in logistics infrastructure: An approach to direct investment into alternative traffic modes to road, particularly rail and coastal shipping, will ease traffic congestion, lower costs and reduce carbon emissions.
3. Skills development: With growing complexity in managing supply chains and changing demands, people issues are taking precedence. The government and private entities need to combine forces to create focused, sustained skilling and training programmes.

Several other areas require focus and attention, including technology adoption and policy simplification for trade facilitation. Several trade institutions are working with key government representatives to promote this agenda. It is important for all stakeholders to realize that the growth of the logistics industry will provide direct support to the growth and development of India, too.

Vineet Agarwal

Joint Managing Director, Transport Corporation of India, India

Supply Chain Risk: New Insights on Recognizing and Responding

Businesses and governments around the world agree on one thing: the need for strong, secure supply chains. America's stance is particularly clear. In a report published in January 2012, President Obama states: "Securing the global supply chain, while ensuring its smooth functioning, is essential to our national security and economic prosperity."⁴

The business community holds similar views. According to research completed in 2011 by the World Economic Forum, of executives surveyed, 93% believe that addressing supply chain risk is a growing priority. Around the same time, Accenture researchers determined that more than 80% of companies now have a formal enterprise risk management programme in place, or plan to implement one within two years.

Leading-edge supply chains – in government or private industry – should clearly be concerned about matters other than security and their changing risk profiles. For example, exceptional cost-efficiency and strong relationships with customers and business partners are also hallmarks of supply chain excellence. In addition, more and more organizations now expect their supply chain strategies to help increase competitive differentiation, open doors to emerging markets and forge new paths to higher revenue and increased profitability.

But in today's environment, managing and mitigating supply chain risk are top priorities. One reason is that the more companies become global (buying, selling or both), the more vulnerable they are to supply problems, port disturbances, labour strife, fuel price swings, and the general ups and downs for which emerging markets are known. Another concern for supply chain decision-makers is the growing intensity and frequency of economic disruptions: currency fluctuations, commodity price swings, demand shifts and so forth. Even natural events (such as storms and earthquakes) are wreaking havoc on people, property and supply chains, with increasing frequency.

Given these myriad problems, one might conclude that we are in a state of "permanent volatility": a world in which disruptive events occur with increasing frequency, intensity, pace and duration.

Unfortunately, permanent volatility poses a particularly large risk to supply chain management, because every node (such as design, manufacture, distribution and transport) is affected in a different, yet significant way. Insights from the World Economic Forum's research – a multi-pronged initiative of surveys and executive interviews across industries and regions – support this observation.⁵

In its report, the Forum states that the supply chain's rising risk profile is caused by several types of disruptions:

- *Environmental:* According to a Swiss Re study, worldwide economic losses from natural disasters in 2010 totalled US\$ 194 billion.
- *Geopolitical:* Since 9/11, the United States has spent US\$ 1 trillion on homeland security. This excludes current and future costs of industry regulations and requirements enacted in response to potential threats.
- *Economic:* Disruptions of this type cover a huge range of issues, from currency fluctuations and demand shocks to export/import restrictions and supplier failings. The auto industry is a particularly dramatic example. Following the 2008 financial crisis, bankruptcy filings among auto suppliers roughly doubled.⁶
- *Technology and infrastructure.* Of respondents to the Forum survey, 41% stated that their companies had experienced supply chain disruptions resulting from unanticipated outages of IT or telecommunication systems.

High-level Improvement Priorities

Noting that 10% or less of its survey recipients can respond fully to supply chain upheavals, the Forum suggests a handful of critical improvements. Better risk-quantification metrics are sorely needed. According to Forum researchers, "Insufficient or improperly focused metrics leave many companies struggling to quantify their risk exposure, formulate cost-effective solutions or compare risk mitigation service providers."

⁴ "National Strategy for Global Supply Chain Security". The Critical Infrastructure Partnership Advisory Council (CIPAC), Department of Homeland Security, http://www.whitehouse.gov/sites/default/files/national_strategy_for_global_supply_chain_security.pdf

⁵ *New Models for Addressing Supply Chain and Transport Risk*. 2012. Geneva: World Economic Forum

⁶ Bankruptcy and Globalisation in the Global Automotive Supply Industry", <http://www.prtm.com>

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Better scenario planning was another stated imperative: “Conducting scenario planning on a regular basis helps ensure that external risks and network vulnerabilities are always top of mind, and that associated mitigation controls are regularly updated.”

Collaboration held similar sway. When companies work together to capture data and promote information sharing, they are well situated identify vulnerabilities and harmonize backup plans, in the event of a disruption. This in turn points to the importance of private-public cooperation. According to the Forum task force, if businesses and governments work together, they can increase network resilience.

Simplifying and internationalizing risk legislation were also key recommendations. To illustrate, the report noted the impact of Iceland’s 2010 volcano. Following Eyjafjallajökull’s eruption, the sluggish response of European transport ministries and civil aviation authorities resulted in uncertainty and delays restarting air traffic. This was primarily the result of: failing to recognize, in advance, the potential threat of volcanic ash clouds from Iceland; the inflexibility of existing aviation protocols; and the absence of pre-existing agreements on safe ash levels.

Thinking Anew about Supply Chain Management

The Forum report reinforces the contention that permanent volatility is a genuine phenomenon with serious implications for supply chain management. First and foremost, organizations are finding it increasingly tough to keep pace with change. A key reason is that many supply chains are built on inflexible foundations. When those supply chains were constructed (most during periods of greater stability), the overriding mission tended to be “integration”: building efficient operations and lean inventories by creating a taut weave of critical operations and partners.

Integration is still important but its limitations are evident in the era of permanent volatility. The principal limitation is adaptability: During periods of rampant change (like now), companies with rigid supply chains cannot change gear fast enough. A similar problem is that, in a tightly integrated system, the slowest partner always defines a business’ ability to respond to market changes – just

as the strength of a chain is limited by its weakest link.

To keep abreast of change, many companies and governments could benefit by shifting their supply chain emphasis from “integrated” to “dynamic”: creating flexible, adaptable ecosystems of processes, people, capital assets, technology and data. This can be termed “Dynamic Operations”: carefully designed aggregations of supply chain components and capabilities that reconfigure themselves in response to changes. When a disruptive situation arises, processes at any node on the supply chain can be adjusted (e.g. rapidly shifting manufacturing locations in response to a weather event). In effect, upheavals are thus potentially recast as opportunities.

The core missions of Dynamic Operations – to achieve flexibility, adaptability and individual node-by-node adjustability – are easy to appreciate but difficult to implement. Accenture has identified four hallmarks of dynamic operations:

1. *Insight to Action*: Capturing, synthesizing, analysing and sharing data to rapidly formulate decisive responses
2. *Agile Execution*: adjusting quickly to volatility by loosening linkages and shedding assets
3. *Flexible Innovation*: Using cross-enterprise collaboration and customer empowerment to accelerate the generation and implementation of new ideas
4. *Adaptable Structure*: Formulating new operating models that smoothly recalibrate in response to shifting stimuli and allow companies to capitalize swiftly on new opportunities

In short, Dynamic Operations represent a conceptual and physical change, a major shift that can take a while to fully embrace. However, the time and effort needed will probably be worth it. According to Accenture research, companies with dynamic operations are better equipped to adjust to change and the efforts of early adopters are rewarded with profitability up to 75% higher than their more rigid counterparts. Moreover, Dynamic Operations do not imply great increases in cost or complexity. In fact, for a relatively small investment, companies can obtain a great deal more flexibility.

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In effect, “dynamic organizations” manage risk proactively and may even be positioned to benefit competitively from disruptive events. With a strong emphasis on adaptability, resilience and the seizing opportunity, they opt to innovate, rather than stand aside and allow opportunity to pass them by.

Jonathan Wright

Managing Director, APAC Management Consulting-Comms and High-Tech Sector, Accenture, Singapore

World Economic Forum Research Highlights

Most Frequently Cited External Disrupters

- Natural disasters
- Conflict and political unrest
- Sudden demand shocks
- Export/import restrictions
- Terrorism

Top Network Vulnerabilities

- Reliance on oil
- Availability of shared data/information
- Fragmentation along the value chain
- Extensive subcontracting
- Supplier visibility

Top Management Priorities

- Trusted networks across business and government
- Effective risk legislation and incentivization
- Improved quantification metrics
- Appropriate data and information sharing
- Enhanced scenario planning

Recommendations for Government and Business

Government

- Improve international and inter-agency compatibility of resilience standards and programmes

Business

- More explicitly assess supply chain and transport risks as part of procurement, management and governance processes

Government and Business

- Develop trusted networks of suppliers, customers, competitors and government focused on risk management
- Improve network risk visibility, through two-way information sharing and collaborative development of standardized risk assessment and quantification tools
- Improve pre- and post-event communication on systemic disruptions and balance security and facilitation to bring a more balanced public- and private-sector discussion

A “Comprehensive Approach” to Tackling Piracy: The Case of Somalia

Somali piracy constitutes a major threat to maritime security. Since 2008, Somali pirates have violently attacked several hundred merchant vessels and held more than 3,500 seafarers captive for months on end, in appalling conditions. More than 60 seafarers have died from violence and mistreatment. The mutating nature of piracy into land-based hostage-taking is also deeply worrying.

Seafarers have been attacked with firearms, taken hostage and used as human shields. Media coverage of these crimes has been inconsistent and weak. The pirates' intimidation tactics and torture methods are becoming known, however, as studies of hostages are emerging. Hostages are subjected to mock executions and physical and sexual abuse. They are denied medical care and some have died from malnutrition.

Piracy is organized crime that raises the costs of international trade. It harms the fishing and tourist industries of East African and Indian Ocean coastal and island states. Many shipowners now avoid calling at important East African ports, like Mombasa and Dar es Salaam. Pirates have hijacked vessels as far south as Mozambique; close to India in the east; and near the Straits of Hormuz in the Red Sea. These are the world's most important shipping lanes through which vital energy supplies and commodities are transported daily on merchant vessels.

The effects of piracy on Somalia itself are entirely negative. Piracy has increased the price of food in the country. Underage Somali boys are coerced to participate and many pirates are lost at sea or killed in action. Piracy is a major concern for the World Food Programme, as it prepares to deliver much larger quantities of humanitarian aid to drought-stricken Somalia.

More than 30 international organizations and initiatives are tackling piracy. None has taken the lead and although much good work is being carried out, the security, diplomatic, legal and law enforcement efforts are still ad hoc and fragmented. An estimated 170 private maritime security companies now operate in this region, three times as many as a year ago.

Despite attempts by NATO, the EU, the US and the naval forces of India and China, these bodies are thinly spread and suffer from force generation deficiencies. Control

over the Indian Ocean is being ceded to pirates and private security companies. This is in direct contravention of the United Nations Convention of the Law of the Sea and relevant UN Security Council resolutions.

Contemplating a Comprehensive Approach Against Piracy

This year, major shipping industry and seafarers organizations, the International Maritime Organization (IMO) and countries like India have called on the international community to take responsibility for re-establishing security on the high seas. In sum, the demands from these parties amount to a call for a bold international strategy to tackle piracy. We need to consider the make-up of such a strategy, its goals and the allocation of roles accordingly. Well aware that others may have presented some of these ideas, before I wish to propose the following:

First, state responsibility for maritime security on the high seas should be firmly re-established as a major principle. Nations, not private security companies, should play the main role in providing maritime security on the high seas.

Second, and consequently, all major shipping nations – including my own country – should commit to providing navy assets to a permanent and UN-mandated maritime protection force in the Indian Ocean, under a mutually acceptable framework. Navy vessels should be complimented by an increased use of “military vessel protection detachments” that can operate autonomously on board merchant and humanitarian aid vessels and thus free up warships for counter-piracy tasks.

Third, the maritime security industry needs better regulation and guidance. More uniform of flag state and port state rules are needed regarding the use and logistical requirements of on-vessel guards. IMO is making good progress on relevant guidelines. Norway has a clear set of regulations that clearly lays out the possibilities, conditions and limitations for responsible use of private maritime security companies on board Norwegian flagged vessels. All flag states should clarify their stance on this issue.

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Since 2008, Somali pirates have violently attacked several hundred merchant vessels and held more than 3,500 seafarers captive for months on end.

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Piracy is organized crime that raises the costs of international trade. It harms the fishing and tourist industries of East African and Indian Ocean coastal and island states.

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More than 30 international organizations and initiatives are tackling piracy.

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Nations, not private security companies, should play the main role in providing maritime security on the high seas.

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Fourth, diplomatic efforts should encourage a stronger involvement from countries within the affected region, setting out their responsibilities in anti-piracy efforts.

Finally, while the shipping industry's main focus should remain protecting seafarers, industry should engage more in assisting capacity-building programmes in Somalia. Such programmes exist to provide alternative livelihoods for would-be pirates, support in building coastal surveillance mechanisms and maritime law enforcement capability and support long-term efforts for stability in the country. Such efforts may build bridges between the shipping industry and Somalis and help to build trust.

Norwegian Warrisk Insurance and the Norwegian Shipowners' Association are providing good examples of a mechanism to develop and follow up concrete projects involving local counterparts. Realism, local knowledge, transparency and risk assessment are prerequisites for success. Practical sense and creativity are also critical to developing sustainable projects in Somalia. This is challenging, but entirely feasible.

It is time the international community took a stronger lead in fighting piracy. Security, prosecution and capacity-building will be important components of such an effort. Industry-government cooperation will be key to its success and can only be developed further if we are willing to think outside the box, together.

Industry, government, shipowners and seafarers are in this together and must find a way out together.

Elisabeth Grieg

Board Chair, Grieg Shipping Group, Norway

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1 & 02: Participants at the World Economic Forum's Summit on the Global Agenda 2010 held in Dubai, 29 November - 1 December 2010





01



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01: Klaus Schwab, Founder and Executive Chairman, World Economic Forum speaks at the Forum briefing ahead of the World Economic Forum's Summit on the Global Agenda 2011 held in Abu Dhabi, 10-11 October 2011

02: Gordon Brown, Member of Parliament of the United Kingdom speaks during the opening plenary of the World Economic Forum's Summit on the Global Agenda 2011 held in Abu Dhabi, 10-11 October 2011





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