FREIGHT TRANSPORT FOR DEVELOPMENT TOOLKIT:
Integrated Logistics Services

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The Transport Research Support program is a joint World Bank/ DFID initiative focusing on emerging issues in the transport sector. Its goal is to generate knowledge in high priority areas of the transport sector and to disseminate to practitioners and decision-makers in developing countries.
Integrated Logistics Services

*Their Significance for Economic Development*
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DEFINITIONS OF TERMS

“Big box” global retailers: A physically large retail establishment, usually part of a chain. The term sometimes also refers, by extension, to the company that operates the store. Examples include large department stores such as Walmart and Target.

BRIC: The fast-growing developing economies of Brazil, Russia, India, and China.

EDI: The structured transmission of data between organizations by electronic means. It is used to transfer electronic documents from one computer system to another (i.e.) from one trading partner to another trading partner.

EPZ: One or more special areas of a country where some normal trade barriers such as tariffs and quotas are eliminated and bureaucratic requirements are lowered in hopes of attracting new business and foreign investments.

FDI: Foreign Direct Investments made to acquire lasting interest in enterprises operating outside of the economy of the investor.

GCMMF: Gujarat Co-operative Milk Marketing Federation, a farm cooperative that operates as a supply chain integrator for its 2.5 million members.

GPS: The Global Positioning System (GPS) is a global navigation satellite system developed by the United States Department of Defense and used freely by anyone to determine location.

ITS: Information Technology Services involve the use of electronic computers and computer software to convert, store, protect, process, transmit, and securely retrieve information.

Lead Companies: Lead companies design and brand products and outsource their production to contract manufacturers.

MICs: Middle Income Economies with GDP per capita of $976 - $11,905.

MNC: A multinational corporation (MNC) is a corporation or enterprise that manages production or delivers services in more than one country.

OEM: An original equipment manufacturer manufactures products or components, which are purchased by a second company and retailed under the second company’s brand name.

OECD: The Organization for Economic Co-operation and Development (OECD) is an international organization of 30 countries that accept the principles of representative democracy and free-market economy. Most OECD members are high-income economies with a high HDI and are regarded as developed countries.

ROE: Return on equity measures a corporation’s profitability by revealing how much profit a company generates with the money shareholders have invested.

SKU: A stock-keeping unit is a unique identifier for each distinct product and service that can be purchased. Usage of the SKU system is rooted in data management, enabling the merchant to systematically track their inventory.
EXECUTIVE SUMMARY

Globalization has imposed entry requirements on developing economies. Countries need to have the ability to synchronize the business processes which take place within local producers with business processes, which take place in the supply chains of their suppliers and their customers. Integrated logistics services are nowadays a critical component of international freight transport systems, but their development and coverage vary widely across countries, in particular in the developing world. This paper explains this important development. It documents the increasingly important role, which third party logistics service providers play in facilitating business process connectivity and thus in integrating producers based in developing countries into the global economy. It provides a look at the global significance of integrated logistics services in a globalized economy, and goes on to review specific examples of establishment of such services in developing countries. These examples in turn suggest a set of specific policy recommendations to help policymakers enable the development of efficient logistics services to serve both their domestic and international markets.

The paper describes ways in which integrated logistics services have evolved over the past 20 years. It describes aspects of that development, which have particular significance for accelerating the economic growth of developing economies. From a review of various means, which third party service providers have used to integrate the business processes of their clients into the supply chains of their clients, it attempts to develop some general principles, which can help policy makers to enhance the competitiveness of their own economies. In additional it discusses the interface between public and private sectors and particular ways in which public policy can enhance competitiveness through this important growth leverage. It goes on to discuss appropriate means and modes for regulating an emerging third party logistics industry and, finally, it suggesting specific initiatives and service design initiatives, which can help, accelerate economic development.

The paper first describes the global significance of integrated logistics services, and explains how these contribute to enabling a number of integrated market defining developments. Furthermore it describes “business process synchronization”, and the special role played by “third party integrated logistics service providers” (both international and national). It then provides a brief history of integrated logistics and economic development with a few examples from the agro-industrial sector, garment manufacturing sector and discusses how business functions executed at the supply end of value chains directly affect business function execution.

It also presents examples of integrated logistics in developing countries and draws on examples from South east Asia, Latin America, Africa and the Middle East. These include: Taiwan’s electronics industry, the vibrant auto industry sectors that have emerged from China, Brazil, Turkey and South Africa, and the high fashion garment industry from Lesotho, Madagascar, and Jordan.

The section on how integrated logistics services have evolved presents examples of the evolution of integrated logistics service providers from freight forwarders, the differences between them, the relationships that have developed between clients and offerors of logistics services, and that between buyer and seller of logistics services. It also discusses the development benefits related to integrated logistics services in terms of lower transaction costs, more effective clearing of markets and of enhanced competitiveness as a result of stronger integration of local economies with the global economy.

The status of logistics services integration in Middle Income Countries and Brazil, Russia, India and China (BRICs) is discussed and this section describes examples from the agriculture sector, the dairy industry in India, the development of third party logistics as an industry from Singapore and Kenya.
The section on regulations of logistics services reflects on the need for regulatory arrangements for newly emergent service sectors and discusses the issues in setting up regulatory objectives, professional certification, technical assistance, and establishing regulatory functions and processes from inception.

Finally, nine recommendations for task teams to incorporate into programs which may be developed jointly with developing country counterparts. These include leveraging of resources of logistics intensive industries, steps to reduce transaction costs, enlarging effective transport market scope, improving distribution network connectivity, facilitating competition both within and between supply chains, and others that pertain to developing skills in logistics management.
1. INTRODUCTION

Integrated logistics services are nowadays a critical component of international freight transport systems, but their development and coverage vary widely across countries, in particular in the developing world. This paper provides an overview of the global significance of integrated logistics services in a globalized economy, and review specific examples of the establishment of such services in developing countries. The examples, in turn, suggest a set of specific policies recommendations to help policy makers enable the advance of efficient logistics services to serve both their domestic and international markets.

2. GLOBAL SIGNIFICANCE OF INTEGRATED LOGISTICS SERVICES

The phenomena, which we refer to as “globalization,” can most easily be characterized by the technologies and management process developments which enable it. More precisely, recent developments in the ways in which industrial and agricultural value adding activities are controlled within global sourcing/assembling/distributing networks define “globalization” ... as do the ways in which local industrial activities can be coordinated with other complementary industrial, agricultural and retail activities taking place in distant parts of a global economy. ¹ The technical and economic feasibility of these new forms of management have opened opportunities for globe spanning industrial networks, which can coordinate the activities of multiple value adding agents, who are disbursed geographically. These new technologies and techniques enable a number of integrated global market defining developments, which include the following:

- competition in which winners are differentiated from losers by opportunity response “time” e.g. product development cycle time, order-to-delivery time and time required to adapt to new competition and time required to absorb new technology;
- the design, operation and control of globe spanning value chains;
- “demand pull” inventory management methods and the continuous replenishment of inventory at the retail end of global chains;
- concurrent design, fabrication and market planning of new products within globe spanning virtual organizations;
- the outsourcing of production to contract manufacturers; and
- the creation of sustainable competitive advantage in highly adaptable, yet highly specialized industrial clusters which are scattered throughout the world and which include many developing countries.

The technology and management process developments which facilitated “globalization” importantly affected the organizational designs of the fastest growing global industries, as well. These effects are manifest in new modes of corporate governance, which create and enforce performance incentives within virtual production/distribution networks, as well as in transparent globe spanning systems for managing quality control and just-in-time inventory replenishment.²

¹ Tom Friedman, The World is Flat, 3.9: A brief history of the Twenty First Century, Picard, 2005
Business process synchronization is the core competency, associated with global logistics integration. It has allowed Original Equipment Manufacturer’s (OEM’s) to adapt quickly to changes in consumer preferences, to new competitive challenges and to new production technologies and, at the same time, to integrate into their production/distribution networks low cost producers based in developing countries. Business process “synchronization” is a prerequisite and precondition for several other aspects of globalization, including:

i) worldwide sourcing of parts, subassemblies and components;
ii) just-in-time production by OEM’s; and
iii) market differentiation based on mass customization.

Most importantly for this paper, the new technologies and management methods associated with globally distributed industrial processes explain the context for integrated logistics services, which specialized third parties, are able to satisfy. Third party integrated logistics service providers create local markets for business process synchronization services. All of the management innovations noted above and their collateral economic developments require, as a prerequisite, synchronized logistics services. Until recently these service capabilities were exclusively controlled by MNC’S. Essentially they were internalized within MNC’s themselves and appeared on their balance sheets as “good will” if they appeared as assets at all. In fact, they were among the most valuable assets, which MNC’s possessed and a source of their significant competitive advantage. Until recently, no external markets existed for these core competencies. Over the past two decades, however, third parties service providers have created new markets in which these competencies could be bought and sold outside the exclusive internalized competency domain of specific MNC’s. It is third party logistics service providers who not only brought these competencies for the first time into the market, but also priced them, combined them with other services and extended their application.

Still the relationship, between third party service providers and their clients remains a complex one, as well as one which is competitively constrained. Users of third party services typically face an important “make” vs. “buy” decision when it comes to strengthening their integrated logistics capabilities. Even when MNC’s finally made a “buy” decision, they frequently insist on strong loyalty and proprietary systems use conditions from their supplier.

For this reason, independent, local third party service providers in developing economies face more severe competitive challenges than do most other categories of service providers. International third party service providers typically enter a developing country market with long term, client account commitments already in place, as well as agreement at corporate levels regarding global competitive constraints. Hence, internal third party providers face local competition with two sets of advantage: core account commitments and first mover advantages in technology/ management techniques.

Demand for the services of international third party service providers continues to exceed supply as a result of two factors:

i) efforts of established Multinational Corporporation’s (NC’s) to extend their global reach and to expand into new developing country markets; and

ii) efforts of new entrants into internationally distributed production based in developing countries, who wish to themselves become MNC’s. Third party logistics management services, together with the ITC technologies, which enable them, have become essential pre-requisites for unlocking development benefits associated with inserting local producers into global chains.

The effects of this successful insertion are visible on almost every street corner of an increasingly homologous global economy. For example, in every supermarket outlet in the world, business process-integrating
technologies installed at checkout counters facilitate precise, just in time and just-enough delivery of perishable food products, 12 months per year, 360 days per year, 24 hours per day. Other examples include contract manufacturers clustered in Madagascar, Jordan and Lesotho who produce high fashion garments, which have economic lives of a single season or less. For these companies, third party service providers manage risks associated with producing too many garments whose design proves unpopular at the retail end of globe spanning chains. Third parties working for retail chains find ways to put extremely short lived goods onto the shelves of specialty retailers all over the world in time to maximize their gross margins without subjecting retail buyers to undue inventory liquidation risks. Lean and fast-responding business models make these possible, ones, which separate product design from product production and from input sourcing. For these business models, third party integrated logistics companies source buttons, zippers, notions and specialized fabrics globally and deliver them to “cut and sew” contact manufacturers.

Mature industries such as auto manufacture and pharmaceutical production have been able to find new life through shorter product design/production cycles and more flexible product development and manufacture. New management methods such as three-dimensional concurrent planning have allowed them to realize break through gains in productivity and at the same time to shorten product development cycles. These same technologies and management methods have facilitated the development of new industrial clusters, which specialize in specific categories of high tech electronic goods production. For example, in Thailand, Taiwan and Guangzhou Province in China third parties logistics companies link local fabricators to parent design and development companies in the U.S. and Japan. More generally, the modern management method, which integrated service providers offer, open the door for companies based in developing countries to full industrial participation in the global economy. “Door opening” opportunities to produce high value goods may be extended, because of their intermediation, even to local companies who lack essential competencies in product design, input sourcing, fabrication and/or shipment. In the global economy local companies with limited competencies are able to compensate for weakness with other strengths because of integrated logistics providers.

“Synchronization” is the premier operative concept in integrated logistics. It entails moving raw materials, component parts and partially completed subassemblies from various locations to OEM platforms for final assembly. It involves, as well, moving inventory of finished goods to retail counters, in just-enough quantities and at a just-in-time pace in order to satisfy consumer demands.  ³

Synchronization requires continuous communication between buyers and sellers, as well as continually updated forecasts of expected demand. For any manufacturing enterprise, production and shipment must always be scheduled forward in order to meet future expected demand, which is constantly changing and always uncertain. Synchronization implies decision-making, which is real time, analytically sophisticated and interactive. It also implies effective supply risk management. For example, it may entail concurrent controls over diverse industrial processes, which are never completely fail-safe. But they affect each other’s process scheduling in compensatory ways, which reduce overall chain risk.

Importantly, as well, synchronization implies intimate business knowledge of the ways in which physical distribution, transport and production scheduling take place in business cultures, at one end of a global chain,

³ Denis Towill, Time Compression and Supply Chain Management—A Guided Tour; Supply Chain Management: an International Journal, 1996, Volume 1, Issue 1, pp 15-27
which are essentially different from business processes and cultures, affecting the opposite, retail end. At the supply end of global chains, many factors adversely affect the ability of local producers to schedule production and shipment and to assure certain just in time delivery. These factors include: poor communications (telephones, internet), poor electricity supply, corruption, rent seeking and unnecessary bureaucracy, thin markets, fluctuating supply and demand, cartels, expensive and unreliable transport services, poorly educated manpower, unhelpful banking practice and regulations, foreign exchange controls etc.

Many countries are being left behind in spite of the efforts of third party logistics service providers to compensate for their supply risk factors, because they cannot adapt quickly enough. Third party logistics service managers can compensate for some level of supply uncertainty but in cases where reliable supply threatening factors are too great their effectiveness is marginalized and more systemic approaches to trade facilitation are required.  

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4 The author is grateful to John L. Hine of the World Bank for making this point during his review of the paper.
3. BRIEF HISTORY: INTEGRATED LOGISTICS AND ECONOMIC DEVELOPMENT

Demand for integrated logistics services in less developed countries has expanded in line with the global implementation of supply chain management techniques. Integrated logistics service providers operating in developing countries have both lead globalization and followed it.

The earliest examples of competitive advantage realized at the level of discrete industrial processes (as contrasted with competitive advantage realized at the level of fully integrated industrial production) emerged in labor-intensive industries in the third world. Third party logistics managers have been instrumental in facilitating these developments from their very beginning. Globe spanning industries in which discrete elements of an integrated production function were distributed geographically include fresh fruit and vegetables, cut flowers, garments, toys, consumer electronics and auto parts. These developments took off in the late 1970’s.

In the 1980’s and 1990’s, similar modes of industrial organization, relying on globally distributed production, expanded to include many other industrial sectors, including for example: processed food, furniture, construction materials, hand tools, construction equipment, pharmaceuticals and even machine tools. In each of these industrial sectors, it was integrated logistics service providers, who were responsible for synchronizing the multiple industrial processes required to fabricate finished goods and to coordinate shipments from suppliers scattered around the globe.

The engagement of integrated service providers has typically entailed the collateral introduction of new forms of industrial organization into developing countries, forms that involve contract manufacturing, contract farming and trans-national production/distribution networks. Hence, its implementation has been episodic and specific to particular global industries or product categories.

Originally, most developing country demand came from two sources:

i) high-end agricultural exports shipped primarily to large supermarkets chains based in developed countries;

ii) labor-intensive manufacturing shipped to so-called “big box” global retailers. In the 1970’s demand for high value agricultural production began to grow rapidly in OECD countries where consumers increasingly demanded year round availability of fresh fruit and vegetables, as well as fresh fish and other forms of table-ready fresh food. Most of this demand came from the Northern Hemisphere and most of the supply, particularly during the off-harvest, season originated in the Southern Hemisphere.

In order to assure reliable year round supply, supermarket chains based in the Northern Hemisphere developed relationships with companies based in Africa and Central and South America to assure reliable and timely supply of high value food. The companies which grew out of these developments operated as pioneering integrated logistics service providers. Their clients were supermarket clients. Importantly, these pioneers assumed full risk associated with owning in transit products, which they moved to Northern markets, and for which they assumed full risk associated with assuring its fresh and timely delivery. Gradually, as they transitioned from commodity oriented “harvest, pack and ship” operations to the processing of table ready fresh packs and microwave able, single-family portions, the labor value added content of their products increased.
A number of agro-industrial clusters developed in developing countries around the activities of these chain integrators, who employed a variety of outsourcing and contract production schemes to expand their production bases once the supermarkets that they supplied acknowledged their ability to perform. In Africa, agro-industrial horticulture clusters developed around pioneering chain integrators in South Africa, Kenya, Zimbabwe, Uganda, Ethiopia, Ghana and Senegal. Parallel developments took place in the cut flower industry where clusters specializing in roses and carnations developed first in Kenya and subsequently in Uganda and Tanzania. Each of these clusters depended on reliable low cost airfreight to satisfy their Northern Hemisphere clients and to assure fresh delivery.

To this end, food chain integrators tested and refined a number of transport management models including contracting with chartered freighter lines, reserving belly space in passenger planes, securing preferential rates from national carriers and providing their own lift capacity in the form of integrator owned air craft fleets. In the 1970’s integrated logistics service providers developed rapidly in several other parts of the developing world in step with contract manufacturing. In search of low cost labor, basic infrastructure and favorable tax treatment, contract manufacturing jumped from one developed country to another during this and the following two decades. Still, among sophisticated investors reliable and timely supply continued to trump all others criteria as a basis for choosing a preferred investment target.  

“Lead companies” which designed, branded and outsourced production to off shore contract manufacturers typically engaged the services of integrated service providers to source transport for them, to integrate transport scheduling together with order fulfillment and customer service, to complete discrete procurement/delivery transactions and, in some cases, to manage entire logistics and procurement operations. The latter most often entailed timely delivery to the distribution centers of specific “big box” retailers.

Contract manufacturing investors have always been notoriously “foot loose” in the garments sector. Marginal changes in comparative advantage based, for example, on the offer or retraction of favorable EU or US trade terms resulted in the relocation of entire industries from one developing country to another. This happened, for example, in the export oriented garment industry, which shifted from South Africa to Lesotho during the apartheid era. The garment cluster that is now in Lesotho was initially located in South Africa and moved en mass in the 1970’s.

The incentives subsequently provided under the US African Growth and opportunity Act (AGOA) program strengthened and deepened the commitment that mostly Taiwanese and Chinese contract manufactures ultimately made to Lesotho. By the late 1990’s, however, it was the synchronization of production planning and shipment in Lesotho with the requirements of US department stores and big box retailers which provided the essential conditions which allowed this industrial cluster to grow. Overcoming Lesotho’s land locked status required persistence and professional “know how.” As did the need to develop arrangements with South African customs for expediting transit shipments and its country’s high transport costs-- the result of strictly limited cross border transport options. Other labor-intensive industries, expanded in similar ways. Comparative cost advantages in basic manufacturing were transformed into sustainable competitive advantages at least in part through the transport system reforms which knowledgeable integrated logistics service providers pursued. Examples include garment clusters in Jordan, Cambodia, Bangladesh and Madagascar, house wares clusters in Thailand.

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5 T Reardon, C Barrett, JFM Swinnen, “Agrifood Industry Transformation & Small Farmers in Developing Countries,” 2009. World Development; 37(11), November.
and Vietnam, shoes and leather goods clusters in Ethiopia and Cambodia, and electronics and auto parts clusters in China. In order to succeed, each of these clusters required the ability to source input supplies globally, as well as the ability to deliver finished goods to the distribution centers of “big box” retailers based in OECD countries, both with high degrees of reliability.

Integrated service providers, in this instance working primarily for lead companies, assisted contract manufacturers to source, ship and trace critical inputs, as well as to schedule and monitor production, shipment and delivery. The terms of sale and the bills of lading, which they developed for their lead company clients, allowed them to capture both tax incentives and economies of scale in the procurement of transport and freight forwarding services.

More generally these service providers worked with local governments to effect the enforcement of standard waybills, standard sales contracts, warehouse receipts, and equipment interchange agreements, all of which were essential to assuring that transactions were completed reliably and at minimal cost. The overriding objective of their investment in local institutional capabilities was the adoption of international precedents and trade facilitation protocols—and the capacities to enforce these protocols predictably. In these ways, third party integrators gradually began to bring government business processes as well as those of other supply chain partners into a harmonized system.

As systems and methods for coordinating government, manufacturing, transport and retail business processes improved, new forms of industrial organization emerged. These forms were designed to support new ways for both dividing work more cost effectively and, at the same time, for coordinating highly specialized value adding activities precisely to overcome the refined division of labor which was taking place within global supply chains.

It is not an overstatement to observe that global production today entails a “joint production function” in which manufacturing activities are fundamentally joined with transport and logistics management activities in the “just-in-time” and “just-enough” delivery of high value goods. In this joint production the costs incurred and the value created on the factory floor directly affect and in turn are directly affected by the costs and values created both by input suppliers and final customers.

Business functions executed at the supply end of value chains directly affect business functions executed at the terminal end of chains as well. The providers of third party logistics services facilitate the integration of these essential business processes across the entire length of the chain. They discharge these functions subject to either contract terms, to the terms of joint venture agreements or in response to other forms of internal incentives affected and enforced within the chain itself.

Traditional tradeoffs between inventory carrying costs and transport costs, which had persisted until the 1980’s when chain-integrated optimization first emerged as an effective global strategy, have since shifted. Long-standing tradeoffs have shifted in favor of higher transport costs and more rapid delivery. Accordingly, transit time savings associated with airfreight have become more valuable versus lower transport costs associated with ocean container transport, rail or truck direct delivery. This shift took place because inventory cost savings have increasingly come to outweigh transport cost savings as the value/weight of design and engineered intensive products has continued to increase.

One aspect of modern supply chains is important to understanding the strategic importance of logistics services. This is the fact that profit is distributed unevenly along global chains. This fact importantly affects service / operating cost tradeoffs. For example, the gross margins which “big box” retailers are able to realize
at the demand end of global chains far exceed the margins which contract manufacturers are able to realize at the supply end. A mission critical role of integrated service providers in global chains has been to assure that products have arrived at the retail counter in time to avoid “stock outs” and “lost sales.”

Inventory control, accordingly, became more important than production cost control in global chains and the effectiveness of this control vis a vis competent logistics service providers has become correspondingly more important than the location of basic production activities.

Since the opportunity cost of lost sales significantly exceeds the opportunity cost of a 10% or even 20% decrease in production costs, the competencies of integrated logistics service providers have became a more significant source of national competitiveness than the efficiency and cost of local manufactures themselves. Tradeoffs among investments in productive cost controls for production, transport and inventory have all moved in favor of inventory.

Increasingly, as well the terms of trade have begun to change with large-scale retailers taking title to goods ex production facilities. In response to these developments the strategic affiliation of logistics service providers has shifted, with more providers working directly for big box retailers as contrasted with the lead companies who own brands and product design rights and who contract out the production. Previously, integrated logistics service providers contracted with lead companies.

Investment in integrated channel control, which was popular in the 1980’s and 1990’s, has become an increasingly important source of national competitive advantage. Engaging the services of competent global, third party service providers is tantamount to renting rather than buying core competencies required to fully participate in the global economy.

The strategies, which global supply chain developers apply to themselves, would seem to have increasing relevance to the governments of developing countries as well, and, particularly to those who are seeking ways to accelerate their own industrial and agricultural development. That is to invest in core competencies, which are sources of competitive advantage over the long term, and to contract for the non-core services of third party providers or align strategically with partners who have proved to be the best in their class for supplying required non-core competencies.

The bottom line for development is this: The intellectual capital or “know how” on which integrated logistics services are based would seem clearly to fall into a high priority area for economic investment. The ability to integrate local order fulfillment, shipment tracing and production scheduling directly into the inventory management and stock replenishment systems of major global buyers is more important for attracting FDI than is low cost production. Yet, it is this very capability, which is most often missing in labor-intensive industrial start-ups, which take place in developing countries.
4. SPECIFIC EXAMPLES OF INTEGRATED LOGISTICS IN DEVELOPING COUNTRIES

Examples can be cited of the beneficial development effects, which can result when integrated logistics service markets operate effectively both within middle-income countries and developing countries. Examples include Taiwan’s electronics industry, the vibrant auto sectors, which have emerged in China, Brazil, Turkey and South Africa, and the high fashion garment industry, which has emerged in Lesotho, Madagascar and Jordan. These examples demonstrate the development dividends, which accompany the development of strong service sectors markets with world class integrated logistics service providers in their mix.

Taiwan manufacturers produce a substantial share of the world’s personal computers, as well as other personal computer-related products. OEM’s based in Taiwan operate in close coordination with lead firms and component suppliers based in the United States and Japan. Integrated logistics service providers, which specialize in high value-to-weigh electronics components, have taken root in Taiwan. They provide much of the “synchronization” which the Taiwan electronics cluster requires to operate competitively. They are effective, for example, in assuring that local production is able to adapt quickly and precisely to the changing technical design requirements, specific customer designs and diversity of business model requirements which come from the lead companies, whom Taiwan OEM’s supply.

Much of the transport, which third party logistics industry source, is airfreight. Integrated service providers specialize in chartering air freighters, in negotiating with scheduled air freight carriers, in operating airport based distribution centers where shipments can be consolidated and deconsolidated and where programming and scheduling of production and shipment for hundreds of thousands of components and subassemblies can take place.

The world’s fastest growing auto and truck industry has developed in China. Over the past decade, this industry has transformed itself from one in which internal competition was limited to two state owned OEM’s and several international joint ventures, one in which auto imports were restricted and automotive product offerings involved little year to year design change, into one in which internal competition has become intense, suppliers have become global in their market reach, product life cycles has diminished to one year and a number of local auto clusters have emerged.

An industry, which was formerly vertically integrated under state control, has broken down into a number of discrete, highly specialized sub-sectors, e.g. auto electronics, tires, batteries, etc. Depending on the subsector area, its technology linkages and dependencies, its distinct skilled labor requirements and material inputs requirements, very different modes of production management may be appropriate, just as different business models, different modes of supply chain governance and different means of process control may prove more or less appropriate. Some require more “in-sourcing” of logistics management and others more “outsourcing.” In both instances logistics service managers are attempting to do the production planning and scheduling which central planners within government attempted to do previously, but on a large scale and with much stronger incentives for performance.

Today more than a hundred new start-up OEM companies are battling for share in what they perceive to be the world’s largest future market for autos and trucks. In this highly competitive market, strategic process alignment between OEM’s and third party logistics service providers has become one of the primary factors required for successful growth.
Not surprisingly, all of the world’s premier auto logistics service providers are present and active in China. Most global OEM’s have arrived with captive logistics service management companies, of their own. Integrated logistics service providers who provide services to OEM’s typically concentrate on just in time parts sourcing and delivery. Most of the freight services, which they provide involve, purchased contract motor carriage; increasingly involving trucks equipped with GPS real time, in cab, controls. They schedule purchasing, shipment and delivery for tens of thousands of auto components and subassemblies. In some cases they operate parts depots and consolidation and de-consolidation warehouses for OEM’s as well. In cases where overseas parts are sourced, they operate customs free zones and manage the customs reclaim documentation relationship with Chinese Customs. Their involvement in the distribution of finished vehicles, on the other hand, has been more limited, at least until recently.

A cluster of more than 30 companies based in Lesotho provides “cut, sew and ship” services under contract to dozens of global retail clothing chains, as well as to high fashion brand designers of men’s and women’s wear. This industrial cluster is able to operate in a short product-life-cycle industry where timely delivery of new seasonal designs is a perpetual challenge only with the assistance of integrated logistics service providers who have progressively refined their competencies in Lesotho. Third party logistics managers handle both in bound and out bound products for the industry. Most shipments entail the shipment of ISO containers via truck through South Africa and ocean shipment beyond the Port of Durban. Flawless fulfillment of orders, timely delivery and effective cost control in a market, which is deeply affected by rapidly fluctuating currency values, are the keys to success for this service sector. The process synchronization efforts of third parties who support the industry go beyond business to business coordination to include coordination among customs, carriers and stevedoring companies in what has become one of Africa’s most congested and service uncertain ports.

What is common to these examples and to hundreds of others, as well, is the success of local production platforms in integrating themselves into the global economy or in the case of China to the larger Chinese economy beyond the provincial borders of specific OEM’s. In all three examples, it was third party logistics service providers who provided requisite competencies needed to move just- enough raw materials, intermediate inputs, packaging and finished goods from a variety of locations to a single primary production platform while actively managing inventory requirements and lead times at origin, destination and point of final retail sale. Accordingly, the specific means and modes of integrated logistics management can and does differ significantly from industry to industry and from country to country.

A related but distinct set of integrated logistics developments is taking place within the food retail sector worldwide where a single business model has become globally dominant. This business model is the “supermarket.” The dramatic success of the supermarket business model underscores the critical importance of integrated logistics services to economic development, even in instances when export driven growth is not an overriding national objective. Domestic supermarket chains have an impact on local farmers and on local agribusiness industries which far exceeds those of donors who, with their development investment and development policy reform efforts, have failed to link farmers to markets with anything approaching the scale or ruthless efficiency of supermarkets. Supermarkets are logistics intense enterprises. The supermarket business model requires a high level of precision in on-shelf inventory replenishment for each individual outlet which makes up a chain. A typical supermarket is designed for sales and not for back room stock inventory holding. The shelves are the stock space in a supermarket. A single store is also a multitude of trade points. One store typically stocks between 10 and 25 thousand distinct stock items or SKU’s. Each of these items

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6 Twenty of the world’s premier Auto OEM’s have entered the China Market.
corresponds to a separate market, which requires demand forecasting, inventory monitoring and resupply on a daily basis. Monitoring in-store inventory is done by software linked to automated scanners in each store’s checkout lanes.  

The work of interpreting these data and of actively managing inventory replenishment, however, falls to well trained logistics management professionals. Other defining characteristics of the supermarket business model are its effective decoupling of inventory replenishment at the level of distribution centers embedded inside the supply system of the chain and inventory needs of individual outlets. Vendors and suppliers deliver their products in low cost, truck load quantities to chain distribution centers. Supermarket employees then manage store inventory. They typically make up store delivery shipments from the distribution center for every-day shipment to individual stores. The skills required to manage the logistics of chain wide inventory replenishment in a multi-store network, for shipment planning and for truck fleet operation over an extended geography represent a major technical step-up in technical competency in many developing countries. However, these skills are critically important to the effective operation of a supermarket.

This is the work, which in some countries third party, supply chain integrators perform for supermarket chains. In China, for example, the third parties who manage stock replenishment for specific categories of food product are called “dragon enterprises.” In other developing countries these strategic functions may be internalized within the supermarket itself, performed by specialized external management teams or in the case of the most rapidly expanding major chain in Africa (e.g. Shop Rite) carried out by a virtual company organized within the chain itself. This company, Fresh Foods, handles local horticulture sourcing and fresh product inventory replenishment in Shop Rite/Checkers stores. Other, so called “big box” chain stores are very much like supermarkets in their business model design and in particular in their logistics management intensity. These “big box” formats have taken root in many developing countries where they have displaced traditional markets. They have proved a more cost effective means for satisfying the demands of urban consumers than other competing retail distribution alternatives. Big box stores, for example, have emerged in the retail pharmaceutical, clothing, furniture and white goods sectors of African, Central American and South East Asian economies.

In each of these retail sectors, logistics intensive business models empowered by specialized competencies in integrated business process management have succeeded in realizing significant welfare gains in mediating between producers and consumers and in delivering cost reductions to consumers. It is their sophisticated logistics management capabilities which are their primary source of competitive advantage vis a vis traditional market institutions. The result of their market growth in many developing countries is a reduction in the national aggregate logistics cost associated with internal trade. These net gains can be measured at the macroeconomic level in terms of lower marketing costs, higher farm gate prices, reduced consumer prices and significantly enhance productivity in physical distribution. In counties in which these savings have been measured, they exceed 3-4 % in terms of aggregate logistics costs to GDP. A primary source of these internal market gains is specialized competencies in integrated logistics management.

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8 Discussions with logistics experts with the international management consulting firms, Halcrow and Booze Allen
5. OUT-SOURCING VS. IN-SOURCING

In the face of intensified global competition, the primary rationale for outsourcing logistics services is a firm’s need to concentrate its limited resources on strengthening what it perceives to be its core competencies——those competencies which are essential to commercial success. A collateral strategic proposition is that firms which have not been able to realize strategic advantage from investing directly in integrated logistics management capabilities, need none the less to affiliate themselves as exclusively as possible with the best of the third party service providers, this as a second best option.

In a seminal article, Joseph Sheffi has suggested the following reasons for the growth of logistics outsourcing within the USA9:

- Need to remain focused on its core businesses;
- Better transportation solutions and economies of scale in transport management (e.g., consolidation, large fleet management, third party P&D);
- Cost savings and improved services;
- Development of necessary technological expertise and computerized systems which exceeds the reach of many companies;
- Need for more professional and better-equipped logistics service professionals.

These same reasons justify even more the use of third party service providers in third world markets where a MNC’s previous experience is limited. It is in just such an environment that the need for moving quickly and for taking advantage of a first mover, time based advantage most influence corporate development plans.

Globe spanning enterprises need to respond to new geographic opportunities quickly, as these opportunities emerge. Importantly, in start-up environments the opportunity costs associated with not relying on third parties are correspondingly lower. Thus, MNCs are inclined to leave non core activities or activities in which they enjoy little comparative advantage vis a vis their competition to local third party logistics service providers who have a local market track record and who specialize in supply chain management functions similar to those which the firm requires.

Even if engaging experienced third parties does not enhance the competitiveness of the MNC, it is also not likely to sacrifice any competitive advantage either, particularly if the third party chosen is among the “best in their local class.” Many MNCs compete in several businesses and serve multiple market segments in each business line, each of which is distinct in its logistical requirements. A related reason why third party service providers may be preferred in developing countries vis a vis in-house alternatives, is that these distinct needs can best be met and best managed for results by choosing different specialized, third parties—each to manage distinct line of business/ market segment service requirements. Qualifying and vetting local service providers, selecting the most capable logistics service managers and then adding or subtracting based on results from the starter set of third parties may also prove easier and more flexible than internal hiring and internal reorganization. Effectively individual export oriented enterprises may develop and control their own

external markets for integrated logistics services and in these markets create strong incentives for rapid learning.
6. **HOW INTEGRATED LOGISTICS SERVICES HAVE EVOLVED**

Integrated logistic service providers evolved from freight forwarders, whose efforts to differentiate their own core freight management services, led to the re-engineering of those services and extending them into new functional areas, this in order to better meet the requirements of demanding customers.

As discussed above integrated logistics is fundamentally linked to integrated business processes, which taken in aggregate we know as globalization. They involve not merely the geographical extension of economic activity across national boundaries but also the functional integration of local value adding activities with complementary ones, which are internationally dispersed.

It follows that the primary clients whom integrated logistics service providers serve are multinational corporations and in particular ones who operate with business models, which call for distributing value adding activities globally to locations where various sources of competitive advantage (including low cost production) can best be secured.

Reliable international transport and telecommunications services enable global logistics integration. Indeed, it is not much of a stretch to observe that integrated logistics services require low cost and reliable transport and telecommunications services as a prerequisite. As these essential services improve within a local developing economy, their costs and reliability reach a tipping point. It is at this point that the transformation from “transport order takers” to a “business process integrator” becomes possible for integrated logistics service providers.

In efforts to grow with their key clients, integrated logistics service providers like CSL Logistics, Caterpillar Logistics Services and MAST, a fashion global supply chain management company, have themselves become global enterprises. They have invested in specialized skills and technical competencies in those sectors in which they specialize, as well as in supply chain infrastructure located in assembly, consolidation and re-consignment points on global transport networks where value within global chains can be captured.

Indeed, strategic points on global supply chain networks have become key switching stations and supply rehabilitation centers for specific product categories, e.g. Dubai for second hand clothes and second hand automobiles shipped into Africa, Miami for South American fresh fruit and vegetables distributed into North America, Kunming, China for cut flowers distributed throughout China and South East Asia. Global logistics service companies build their supply chain infrastructure forward ahead of demand before new distribution platforms establish themselves. Thus, they develop a presence in specialized global way stations for garments, cut flowers, farm equipment, construction equipment and regional Internet based consumer goods re-distribution. From these strategic bases, they are able to serve the supply chain operating requirements of newly arrived MNCs with unique precision, efficiency and speed. In this way, regional clusters are forming, which create external economies, based on highly specialized services, which support low risk, high efficiency and agile regional supply chain formation.

The functional as well as the geographic purview of third party logistics management services have expanded over time. Third party services providers offer their clients a constantly increasing variety of options ranging from narrow ones, for example, ones limited to managing various aspects of physical distribution, to broad ones, including ones which involve them in actively managing various aspects of clients supply chains, providing them with customer service support, such as equipment installation, recycling and product re-use and re-manufacture.
The newer responsibilities, which third parties have most recently assumed imply different modes of cooperation with clients and different means for mutually managing process controls. If the original justification for engaging the services of third party logistics service providers was to reduce transport and inventory costs and to release capital for more product use, more recent justifications relate to accelerating market growth, engaging new sources of supply and improving services to new categories of customers.

These new justifications are increasingly strategic and less tactical. They imply longer-term relationships and more reciprocity between industrial buyers and integrated logistics service providers. Their effective cooperation, for example, often requires reciprocal changes both in organization and in systems. It is in this area that the third party provision of integrated logistics services is most distinct vis à vis other forms of business service delivery.

In addition to the degree of shared responsibility and depth of intrusion into the control over client’s strategic business operations, a second basis exists for distinguishing third party logistics service providers. That basis is the level of their sophistication as systems integrators and systems operators. One measure of distribution system complexity is the number of Stock Keeping Unit (SKU’s) which a third party is able to manage simultaneously. Another is the number of stages of supply chain integration which it is able to balance in terms of forecasting inventory requirements, trading off customer service, inventory and operating objectives which are typically offsetting and controlling these tradeoffs day to day in a fail safe manner. Final assembly of different products may require, for example, the programming, scheduled delivery and inventory monitoring of anywhere from hundreds to tens of thousands component parts and subassemblies.

In general, integrated logistics service providers are more specialized and more intrusive into the core businesses of their clients than are freight forwarders. Some of them, moreover, have developed highly specialized competencies in global sourcing or in managing supply chains for specific product categories. Several integrated logistics providers, for example, have established themselves as global leaders both by offering unique competencies within specific globalizing industries and also by operating from multiple operating bases where the global industries, which they serve, are clustered. Some of these globe spanning integrated logistics service providers have grown with specific accounts and others have diversified their customer base within the global industries which the service uniquely well. As specialized logistics service providers have developed they have redefined their own value proposition to include global sourcing and third party provision of supply chain management expertise, as well as more routine transport procurement, order fulfillment and inventory management functions. When integrated logistics service providers offer systems support to their clients, which are “architectural” as well as “operational”, they evolve into “fourth party logistics service providers.” Several companies have evolved, for example, into global leaders in the sourcing, procurement and supply management of auto parts for auto fabricators. Among these is Ryder Systems, which offers OEM’s turnkey logistics management services, as well as a full menu of component transport services worldwide. Ryder Systems has succeeded in deconstructing transport services into their basic factor elements (e.g. full service trucking, truck/rail intermodal, private fleet management, bare back truck leasing, wet leasing with drivers but without the need for maintenance, one way leasing, etc.) and reconstruction these transport in ways which satisfy not only the transport needs but the logistics management, financing and customer service needs to client auto OEM’s as well. Another case in point is the specialized global supply chain management company, MAST, which supports the procurement and contract manufacturing operations of many of the high fashion goods retail chains based in North America and the EU.
Another way to usefully segment the industry is the relationship, which develops between clients and offerors of logistics services. These can usefully be arrayed along a continuous spectrum, with two important dimensions: a) degree of mutual commitment; and b) degree of business process integration. Don
Bowersox, one of the deans of supply chain management and founder/director of the Supply Chain Management Program at Ohio State University, first commented on this dual continuum in 1989.  

In a pioneering article, Bowersox observed that the third party logistics service industry had been developing along distinct lines which could usefully be differentiated in terms of degree of trust and degree of intrusiveness in the relationships between buyers and sellers of logistics services which were explicitly revealed in those relationships. Thus, some services are purchase at spot prices, on a consignment-by-consignment basis, without the need for formal contacts which survived the delivery of services. Others entailed more formal codification of contractual arrangements including continent provisions for various actions and recourse for action under different circumstances. Service contracts vary as well in terms of length of service. This is proxy measure for mutual commitment and for mutual intrusion of strategic business processes. See Figure 6-1, below which characterizes relationships between Buyers and Sellers.

6-1: Relationship Between Buyers and Sellers
In the lower left corner of the schematic shown above is the “one off” transaction, which may be completed, for example, with a for-hire carrier. This “one off”, transport service “buy” entails a minimum requirement for third party, management intervention or oversight. Other options entail progressively greater mutual commitment to shared decision making and shared data between clients and service providers. Moving towards the right upper corner of the diagram agreements, which bind the parties becomes correspondingly longer and entail more formality and detailed specificity in their terms. The categories of relationship which ascend from the lower left to the upper right of the diagram represent degrees of increasing mutual obligation, ultimately leading to the most compelling agreement terms, e.g. those which apply to integrated logistics services. These terms typically imply exclusivity with respect to clients who are based in the same industry and a deep degree of confidentiality, as well as deep levels of process integration.

The three forms of cooperation on the right side of the scale may be viewed in two ways: both as forms of increasingly strong strategic alignment and as categories of market segmentation for third party service providers. Each increasingly strong form of client alliance (e.g. partnership, third party agreement, and integrated logistics service agreement) implies a progressively narrowing client focus and an increased commitment to dedicated personnel, specialized assets and technology development, all designed to support the strategic agendas of fewer or ultimately one client in any particularly market. As service provider-client relationships intensify from partnership to third party agreement ultimately to integrated service provider both planning and management functions become co-joint. At the same time investment in facilities, equipment and training all have more specialized purposes, e.g. to meet the needs of a specific client. Importantly as well as service provider client relationships become progressively more trusting and mutually supportive. Importantly, as well, information flows with fewer restrictions or constraints between organizations.

In each of these increasingly more interconnected segments: transport, handling and customer support services, become less standardized and more tailored to a client’s unique competitive and market circumstances. Accordingly, measures for service provider success become progressively more aligned with the strategic agenda of the client, e.g. clients ROE or market share, and less measurable in terms of tactical performance, e.g. transport and logistics cost per unit of sales. The integrated logistics service provider becomes an essential source of competitive advantage for its client and less the provider of efficient transport/logistics service. Integrated service agreements entail the deepest level of cooperation with clients’ organizations. In this segment the service provider may assume responsibility, in whole or in large part, for the entire logistics process, including facility management and personnel administration.
7. DEVELOPMENT BENEFITS RELATED TO INTEGRATED LOGISTICS SERVICES

The benefits of integrated logistics services are the benefits of low transaction cost, of more effectively clearing markets and of enhanced competitiveness, as a result of stronger integration of local economies with the global economy. It is common wisdom that the logistics cost required to complete a buy-sell transaction in any given developing country is the attribute, which best determines the competitiveness of the entire national economy.

The availability of first-best logistics integration services, regardless of their origin, is crucial in expanding export opportunities into sectors where countries may have a comparative advantage (e.g. in manufacturing, agriculture, or even other services) but has been translated into competitive advantage. That is to say production cost advantages have not been translated into sustainable competitive advantage, which is adaptable, agile and based on service excellence. Their availability is equally important to assure that the domestics markets operate efficiently.

An important measure of this efficiency is the national aggregate logistics cost. Aggregate logistics cost-to-GDP ratios for high efficient national economies like the US are less than 9%. Comparable ratios for emerging middle income economies, like those of Brazil and South Africa, exceed 14%. Developing economies exhibit even lower levels of logistics cost efficiency, of 20% or more. The creation of internal markets for integrated logistics services is the least costly way to reduce aggregate transaction costs and improve national competitiveness.

Integrated logistics services are the “software” which facilitates global market integration. Investments in transport and telecommunications infrastructure are the “hardware.” Both, of course, are required, but as discussed below combining the two is the most effective way to realize net competitiveness gains quickly for a national economy.

An article in a recent edition of the Harvard Business Review (HBR) outlined three defining characteristics, which are essential to enhancing the competitiveness of supply chains.11

The HBR article discussed these characteristics in the context of individual private sector value chains. However, the same conceptual framework might usefully be extrapolated to entire national economies.

The attributes of competitive national economies are efficiency, agility and adaptability. Efficiency relates to the speed with which working capital required to fund end-to-end supply chain activity turns over. In general, the faster the working capital turnover within a value chain, the more efficient the chain. Efficiency, at the macroeconomic level, is related to the ratio of aggregate logistics cost to GDP referred to above. At the industrial sector, it relates to physical productivity: ratios of outputs to inputs and finance ability through local capital markets. Industrial organization, which allows effective decision making to be substituted for buffer inventories, and absorption of appropriate technology, which allows physical distribution and other value adding business processes to be effectively integrated, increase supply chain efficiency. Still, efficiency is only part of the macroeconomic characteristics, which distinguishes high efficiency distribution economies

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from low efficiency economies. In the case of high value economies, which produce highly, engineered products or high, designed-in value products, agility is an even more desirable characteristic.

Agility refers to the capability of national distribution systems to deliver the appropriate level of inventory to the retail end of chains without accumulating excess inventory and without causing sales to be lost for lack of stock. In the global economy of the 21st century, higher value-to-weight products and products which contain high levels of engineering, design and intellectual property content, require reliable and timely delivery to consumers. They require agile supply chains. Hence, another role which third party logistics service providers play, is that of lead agent for competitiveness enhancement. Third party logistics manager can upgrade manufacturers of labor-intensive manufacturers based in developing countries from low value manufacturing to higher value manufacturing, from low-end market goods to higher end market goods. In global industries in which the competitive rules are changing rapidly, still a third design attribute is essentially important.

This is adaptability. Adaptability refers to the ability of national value chains to change in response to competition, to new process and product technologies and to shifting requirements on the part of consumers. Integrated logistics service providers can and should play a role in enhancing competitiveness for third world clients under all three of these performance parameters. An example of adaptability can be taken from the development of high value agricultural production in the Southern Hemisphere. The production of high value horticulture, processed food and meat has become a primary source of wealth creation among many low-income agricultural economies over the past decade. Arrangements similar to those which arose in labor intensive manufacturing evolved in the high value horticulture and floriculture sectors of developing countries, as the timeliness and reliability of delivery of safe food products has increasingly trumped “low cost” as a source of competitive advantage. The logistics challenges associated with developing reliable cold chains based in various production platforms are inherently complex, changeable and contextual. These challenges involve moving fresh fruits, vegetables and cut flowers from farm fields through packing houses to cold warehouses located near airports and then transporting fresh products long distance in insulated air containers on chartered air freighters. Because the value of fresh products diminishes over time and requires strict temperature control and monitoring, the logistics challenges associated with the “new agriculture” are more daunting than those, which confront logistics service providers who specialize in labor intensive manufacture. Zero defect service management of the entire chain moreover is required in order to satisfy increasingly strict food safety standards. Third party logistics managers have accordingly played multiple development roles in building this globe spanning industry.

It is not in export markets alone that third party logistics service providers facilitate market upgrading. Their support is equally important to stimulating domestic private sector investment and in enhancing access for farmers to domestic food markets, which are estimated to be 10 times larger than export markets for most developing countries. The so-called “super market” revolution, which is currently underway in the developing world, is at its foundation a revolution in value chain management and in integrated logistics. Thus, for example, one of the fastest growing supermarket chains in the world is based in South Africa. Its name is Shoprite Checkers. With its logistics intensive business model Shoprite Checkers has been able to expand into 20 SSA countries from its primary supply base in SA and in the process to lower barriers to cross

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12 T Reardon, C Barrett, JFM Swinnen, “Agrifood Industry Transformation & Small Farmers in Developing Countries,” 2009. World Development; 37(11), November
border trade in food and to allow comparative advantage to become effective for the first time in many African agricultural markets. Shop Rite Checkers has succeeded in integrating SSA food markets where the IMF and the WB have failed.
8. STATUS OF LOGISTICS SERVICES INTEGRATION IN MIDDLE INCOME COUNTRIES AND FAST GROWING DEVELOPING ECONOMIES (BRICS)

Increasingly, developing and developed countries can be differentiated along the lines of "low quality" and "high quality" service economies. Much of this differentiation relates to the relative sophistication of the supply chains, which are anchored in various developing economies. In some, cases, supply chain connectivity and the provision of what Bowersox has described as “immaculate recovery” capabilities have translated into a direct source of competitive advantage for an entire economy, whose core service industries attend to the management and correction of supply chain failures in neighboring economies. See Box 2 below, which describes Singapore’s economy, much of which derives from the ability of its logistics service providers to manage risks associated with procurement carried out in other neighboring ASEAN economies.

In developing countries, legacy trade process steps have typically operated independently of one another, with each process step being completed serially before the next process begins. Information flows back to producers are similarly restricted to staccato patterns, with data flowing back to producers from consumers as information passes slowly and uncertainly back through business processes which are not designed to facilitate market feedback or communication regarding inventory accumulation. Moreover, in legacy trade structures strategically positioned trade partners have an incentive to withhold market information in an effort to extract rents. Accordingly, slow and uncertain feedback from the market place causes production to grossly over or under shoot actual demand in developing countries. In the absence of the more rigorous process integration and systemic process controls found in more developed economies, inventories accumulate between each value-enhancing step in the supply chain. The development and design of integrated logistics services may have its origin in more developed countries. However, recently innovative and notably successful modes for organizing and delivering integrated logistics services have arisen in MIC’s and BRICS, which hold out valuable opportunities for South-South technology transfer. The most interesting of these developments include the integration of logistics into marketing systems or commodity exchanges in developing countries. To this end, market institutional designs can be expanded to include functions, which are essential to assuring low cost transactions, transfers of appropriate technology and just-enough-delivery of products onto markets. Supply chain management technologies are available to carry out the work of linking farmers to markets, once it is agreed and specified which was not available two decades ago. An example of such a development is described in Box 3 below.

Thus, for example, a third party service provider has recently emerged in Malawi, whose objective is to change the terms of sale and the method for compensation for small scale farmers who trade their tobacco on the Malawi tobacco exchange. The current trading arrangement available to farmers involves their transport of small lots of tobacco leaf to one of the three exchanges, which the Malawi Tobacco Commission operates. 13

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Raw leaf tobacco is held in storage at the exchange until the lot is inspected and tested by auction expert testers. Once tested, quality certified lots are brought onto the exchange floor for competitive tender. The small lots sizes which small holders offer and the higher rejection rates (in excess of 25%) which they incur have created an enormous increase in the work load of the auction itself and a corresponding back up of inventories waiting to come onto the auction and/or have the lots waiting to be consolidated for export. Buffer inventories exceeding 12 weeks of sale volume accumulated in 2008. As it is currently organized the tobacco auction and its collateral operations act as an hourglass constraint to the efficient flow of tobacco exports. Congestion on either side of the exchange leads to a degradation in value, when leaf is handled multiple times, walked on in the process of accessing neighboring bales and stored away for excessive periods. This problem is worst when the tobacco waits on the back of trucks queued at the auction waiting to jump the queue and get a delivery slot. Waiting times can be as great as 12 weeks at the peak delivery season. The Tobacco Auction applies a first in, first out principal to its warehouse management. Unfortunately tobacco leaf, which is stored for a long time, can become moldy and loose value. It makes it extremely difficult for buyers to estimate the total level of the annual crop and hence the remaining “buy” which they require to fill their standing orders for their customers. The new logistics service would complement auction price discovery processes. It would allow auction-determined prices to apply at the farm gate. However, it would remove the capacity constraints on auction floor inspections and tobacco leaf storage in the three existing exchanges, which currently inhibit tobacco leaf flow.

A second example of an innovative service provider, which has been able to integrate farm level production with marketing and urban distribution of food products, can be taken from India, where a food distribution juggernaut has emerged from the dairy sector. The Gujarat cooperative milk marketing cooperative was founded in 1946 and has grown tremendously until today it has become India’s largest food marketing cooperative. GCMMF is a province level apex organization, which developed from a raw milk collection, processing and marketing cooperative to develop a full line of processed food products under the brand AMUL. GCMMF is owned and operates in the interest of its 2.7 million farmer members. It handles 10.2 million liters of raw milk per day, 7.4 million of which are collected from its members. GCMMF generated revenues of $1.325 billion in 2007/8 and it operates dairies, milk collection facilities, distribution centers, truck fleets and numerous food processing plants. The AMUL brand has been extended to include more than 70 processed food categories. At its core, however, GCMMF remains an integrated logistics service provider. Other examples can be cited in the dairy sector where a variety of innovative logistics service business models have been launched in developing countries which link household level dairy producers to dairies buyers and which own and operate essential supply chain infrastructure, in the form of cold milk assembly stores and/or tank truck fleets. In each of these examples and in many other successful cases, as well, which might be cited, developing country based integrated logistics service providers have identified the basic business processes which were either under provided or poorly managed within supply chains. By filling in the missing systems, coordinating previously uncoordinated process and managing inventory third parties have been able to offer an array of profit enhancements to producers, which they were not able to secure on their own.

Within developing countries a new generation of logistics service providers has begun to specify transaction cost and service parameters which meet or exceeded the expectations of potential customers who had previously not fallen within the market ambit of producers, indentified appropriate technologies to fill in weak commercial linkages and secure means for financing these technologies. This is the short story of integrated logistics service success, which has emerged from the bottom up in developing countries. The long story is

much more complicated. Two case studies, boxes 2 and 3, elaborate on some of these details in the instance of two examples:

**Box 2 Development of a Third Party Logistics Industry in Singapore**

The development of third party logistics service providers has accelerated the development of regional trade hubs like Hong Kong, Dubai and Singapore. Its role in these leading trade centric rapidly developing economies deserves close scrutiny. In 1999 Bhatnagar, et al surveyed industrial companies based in Singapore in an effort to understand their reliance on third party logistics service providers. Of the 126 usable responses, which the survey team received, 60.3 percent engaged the services supplied by third party logistics and 39.7 percent did not. Those, which used third parties, tended to use them both for managing domestics as well as their international traffic flows. Commitments to third party service providers did not appear to depend on the size of the company. Most of these relationships were based on formal contracts with a term of one year or more. Companies with large staffs as well as ones with small staffs engaged their services.

Companies that did depend on third party logistics service suppliers were long-term users who had used the services of at least one for three years or more. In response to a separate set of questions, 76 percent of the respondents described their dependence on third party providers whom they had engaged as either “extensive” or “moderate.” Still industrial firms preferred to diversify their dependences on third party providers. Almost three quarters of the survey respondents relied on two or more providers at the time of the survey. The kind of work, which third party service providers performed, varied significantly, with a large percentage of them involved in consolidation, order fulfillment, carrier selection and freight payments. While a relatively small percentage provided third party product assembly, order processing, inventory replenishment or customer spare parts supply. A medium portion of the industrial firm respondents used their third parties to carry out the following functions: rate negotiations, fleet management, product returns and provision of logistics information systems. Reasons cited for industrial companies’ use of third parties included the following, in priority order:

i) cost savings and flexibility (customization);
ii) free resources to focus on core business;
iii) customer satisfaction;
iv) employee morale;
v) increased productivity;
vii) access to up to date technology and cutting edge expertise.

Organizational changes from own provision of services to dependence on a third party posed a significant challenge for some of firms. Sixty percent of the responding industrial firms were not initially enthusiastic about the change. Their initial concerns were with loss of direct control, levels of service quality, costs of outsourcing and with the competencies and reliabilities of the third party firms. Indeed, more than 70 percent, of the companies interviewed did experience some initial implementation difficulties linked to integrating their business processes with those of their service providers. These included re-orienting the logistics service company to support its client company’s policies, overcoming internal employee resistance, price negotiations and initial billing issues and integrating computer systems and telecommunications linkages.

With that said the large majority of firms interviewed revealed that they are satisfied with the performance of their logistics service providers and that they planned to deepen and extend their dependence on them in the future. Regardless of whether they depended on third parties or managed logistics functions internally, companies participating in the survey concurred with respect to performance measures ranking as most important on time shipments, inventory accuracy, shipping errors and customer complaints. On the basis of their performance under these measures industrial firms increasingly base their decisions about which service providers to favor with their business.
Box 3: Development of a pro-poor third party logistics management service in Kenya

Drum Net, is a wholly owned program which PRIDE AFRICA manages and operates. PRIDE AFRICA is an NGO. Drum Net began offering fully integrated logistics services to poor smallholder farmers in Kenya in 2002. It has developed a system for providing farm inputs and for assembling, marketing and transporting farm outputs, including primarily non-traditional, high value products. Over time Drum Net has become increasingly financially self-sustaining. Its revenues are derived from a fixed fee of 10%, which is collected from the gross revenues, collected from institutional food buyers for its client’s farmers. Drum Net offers its members an portfolio of services including technical assistance, market information, transaction management, logistics and transport management services together with financial services. These are combined into a seamless fully integrated logistics management service, which it offers to client farm level organizations. Subscription to Drum Net service is based on a one-year contract, which can be rolled over based on mutual concurrence. Importantly, Drum Net operates a network of technical service centers from which its own agricultural extension agents and technical advisors provide agronomic, commercial agricultural production and supply chain integration advice. Drum Net has also organized ancillary networks of farm input providers, which provide credit to Drum Net clients. These clients have been provided with network credit cards which allow them to activate credits for farm inputs up to a specific credit level determined by their production. Drum Net backs the credit of its members to the commercial bank which issues the credit cards. It also facilitates longer-term credit for its members. Most importantly, Drum Net secures long term off take agreements for its members with institutional buyers. These off take agreement involve farm products, which are non-traditional to smallholder farmers. The NGO integrated service provider also offers quality seed, fertilizer and farm equipment all designed to assure quality production. It also manages the assembly and delivery of these non-traditional farm products to clients who include both institutional food buyers and food wholesalers.
9. REGULATION OF LOGISTICS SERVICES

Regulatory arrangements for newly emergent service sectors like that of integrated logistics services often need to be set up from a zero base and even once chartered and organized, regulators frequently lack sufficient resources to engage highly skilled staff. In other words, developing a workable regulatory framework is as much a practical matter of dealing with business constraints, e.g. budgetary, human resource and facility constraints, as it is a matter of putting elegant economic theories to work. Overcoming these constraints takes time and often requires external technical assistance.

With that said, relatively few examples of effective regulation of integrated logistics services can be found anywhere in the world to reference for guidance. Heavy-handed regulation would, in any case, seem likely to frustrate the kind of supply response from which most developing countries would benefit. On an a priori basis it can be confidently said, even in the absence of a great deal of fact based evidence, that light-handed regulation would be superior to heavy-handed regulation in almost every developing country context.

Any discussion of regulatory safeguards must of necessity begin with a discussion of regulatory objectives and the public interest. One appropriate objective for a regulatory regime appropriate to the integrated logistics service subsector would seem to be the development and maintenance of supportive service market institutions, which are at the same time open, adaptable and pro-competitive. Diversity in value added approaches and diversity in the ex patriot origins of service managers would seem to be collateral aspects of this market development objective, as would the increased competition, which low market entry standards and few economic restrictions would appear to foster.

As argued above, logistics service management services are a strategically important service sector for most developing economies and assuring that this service sub-sector operates at or near the technology frontier should be an explicit public policy objective, as well. This objective can best be achieved once again through open market entry, including liberalized business investment and business permitting policies, as well as through liberal emigration policies, as these apply to ex patriot logistics managers who bring specialized skills into a developing country. Protections against foreign sources of service supply are particularly detrimental to economic growth because, in general, such protections result in a tax on production.

Once having reached the technology frontier it is equally important that local service providers remain unconstrained in their ability to explore new opportunities for service innovation and for the profitable application of their specialized competencies to new industries. As the examples cited above demonstrated, it is extremely difficult to map firms, which operate as third party logistics integrators neatly into segments based on function or value added definition, or, indeed, to characterize definitively the types of services, which they offer.

As a general business category “integrated logistics management services” have the potential to molt into new enterprise forms and new service definitions, which transcend freight forwarding and other forms of traditional transport facilitation. This kind of transformation is highly desirable and should be encouraged. It follows that constraints in the form of business licenses, occupancy permits and data sharing partnerships with government agencies responsible for managing border protections need to be lowered and service experimentation, new modes of joint venturing and new forms of data sharing partnerships encouraged.

The public interest objective in regulating integrated logistics services is to assure that local productive enterprises are able to reach the technology frontier for excellent supply chain management practice, as
The overriding public interest is to allow an efficient market to develop for third party provided services—a market for the competencies, which enable business process synchronization.

The best of these competencies will remain internalized, for some time within MNC's, who invest in them continuously in order to create and/or sustain their own competitive advantage. With that said, the public interest in developing countries is to externalize these specialized competencies, to facilitate their transfer from inside MNC's and from inside globe spanning logistics service providers like FedEx, CSL Logistics or Caterpillar Logistics Services to local service providers.

The best way to effect this kind of externalization of service competencies is through light landed regulation which first attracts best global technologies and management practices and which then facilitates competitive emulation, spinoffs, outsourcing, new service enterprise start ups or foreign/domestic joint ventures all of which makes specialized competencies available more widely and affordably to local producers. The integrated logistics service industry contains multiple segments and multiple entry windows. Regulatory policies need to be set which encourage diversity and which maintain openness for various levels of investment and different types of service delivery.

At the same time, regulatory regimes need to provide less sophisticated buyers with some assurance that the advertised capabilities, competencies, and skills of third party service providers are genuine. A defining feature of third party provided integrated logistics services is their lack of homogeneity. It follows that the standards for quality service must of necessity be highly individualized at the level of clients. Indeed, establishing specific regulatory criteria for determining whether any individual service enterprise is qualified to offer logistics integration services is best avoided.

Professional certification is more certain and less complex than firm level certification. Collective professional certification is preferable for the licensing of specialized service enterprises as well, because the public interest is to create a fluid and open external market for specialized skill sets, which facilitate rapid “DNA recombination” into new enterprises.

The professional certification of individual professionals working for specific service companies can be useful not only for the potential buyers but also for incentivizing continuous learning within enterprises and for stimulating competition based on service innovation among them. The process of setting professional standards can most effectively be delegated to an independent professional association, which can establish its own threshold conditions for professional certification, as well as for more advanced standing.

In this dynamic service sector these criteria are very likely to require frequent updates. Periodic professional re-certification needs to involve a rigorous process of retesting and re-certification with specific software systems since the arena of supply chain management, like accounting, is becoming increasingly technical and systems based.

In some developing countries, processes of professional certification have been taken up by customs agencies which certify the professional standing of customs agents in the private sector or by professional associations who interpret the domain of their members activities too narrowly and which, correspondingly, constrain the ways in which innovation and competition among service providers can lead to enhanced competitiveness for the clients whom they serve.
Professional fitness can be determined in part by the attainment of an appropriate technical degree. In order to accelerate the development of technical skills and to fulfill the education requirement associated with professional certification, it is fundamentally important that a professional management-training center be organized in conjunction with a faculty of industrial engineering, business administration or economics at a local university. The re-certification process would involve enrollment in appropriate continuing education classes.

The key role for government in this sector is to provide or rather to have provided sufficient information, which will allow professional competencies to be appropriately valued and priced. To this end, regulators must first assure that the information regarding professional competencies, which logistics service providers provide to their potential clients, is true and verifiable. To this end, a basis needs to be established for confirming that service prospectuses are valid regarding the professional capabilities of the core staff.

In addition to information related to the professional competencies, information concerning the business practices and the ethical dealing of individual firms is also quite valuable. To this end, a system needs to be organized for registering complaints, client disputes and legal actions taken against individual firms. Information should be made available to prospective clients regarding past misdeeds or past misrepresentations.

At the same time, efforts need to be made to prevent anti competitive practices, which involve price discrimination based on unfair logistics considerations such as variable terms of trade. Thus, the basis upon which the sale price of goods can—and cannot—be differentiated among buyers needs to be clearly defined so that opportunities for price discrimination based on considerations other than relevant transport and handling costs are minimized.

Because of the intrusiveness of integrated logistics in the core business processes of many global enterprises and the strategic value of this service sector to an economy which wishes to benefit from an FDI commitment from these global enterprises, a variety of legal organizational forms, joint ownership forms and contractual forms need to be made available to them, including wholly owned subsidiaries of MNC’s, foreign/local joint ventures which involve foreign partner control, freight management cooperatives, NGO’s and farmer and employee owned supply chain management companies.

Importantly, governments need to create openness in the institutions which manager cross border trade, provide open access to the data which they control and facilitate system-to-system interfaces with border management agencies in order to make their economies more susceptible to the kinds of business process integration which logistics service providers offer. Just as importantly, governments need to assure certain enforcement of the terms of standard waybills, bills of lading, warehouse receipts, and equipment interchange agreements. In addition, they need to assure that dispute-resolution mechanisms involving commercial transactions are fair, rapid, and predictable in their outcomes. These are the basic building blocks of trade facilitation, which providers of integrated logistics services require so that they can carry out their work and deliver benefits to their clients.

The methods and technologies of integrated logistics management have evolved quickly over the last 30 years. The underlying technologies, which enable integrated logistics, however, still involve ITC and related applications software. Local systems and data bases located in developing countries need to be connected to other systems and data bases located in developing countries in order for real time exchanges of forecasts, inventory levels, shipment schedules and production schedules to be synchronized. All of these interfaces require genuine technical “know how” which only experienced systems integrators possess.
A critical area then, which needs to be of concern to regulators, is assuring the availability of digital information systems and the openness of existing ITC service providers to support new supply chain management applications, to allow new systems applications providers to gain access to existing ITC networks and to introduce new forms of digital information exchange on existing platforms. All of this is in the public interest. In many developing countries, legacy licensing standards and the protective grandfathering of ITC rights can be obstructive of new service providers and new applications software. This is a situation, which regulators need to ameliorate.

Arguably, when it comes to regulation in a sector like integrated logistics services, developing countries are different from developed countries, in that they have less prior experience and less sophistication with principal based regulation, which cedes broad latitude to regulators to interpret general principles and apply them on a case by case basis. In developing countries, rule based regulatory regimes may have a more useful role, particularly ones which devolve less interpretative latitude to regulators. It follows, the spare regulatory frameworks —ones, which explicitly identify regulatory objectives, clearly define rule making processes, and effectively delegate rule making authorities to a combination of public and private sector authorities—might well serve the majority of cases.
10. RECOMMENDATIONS

What emerges from this review are a set of investment targets and policy reform themes that World Bank task managers need to incorporate into the programs, which they develop jointly with developing country counterparts. Among the most important of these are the following:

**Leverage the resources of logistics intensive industries.**

Attractive opportunities exist to build development partnerships with logistics intensive industries. These include supermarket chains, Internet based merchandising companies, regional fertilizer distributors and/or export oriented, and labor intensive Export Processing Zone (EPZ) developers. The partnerships should be built in ways which drive down unit transport costs, rationalize market distribution systems, reduce cross border trade barriers, effect rapid integration of multimodal transport networks and re-engineer urban land use patterns in ways which are beneficial for the entire macro economy. To this end, World Bank task managers need to search out opportunities for new forms of public-private partnership and include appropriate PPP transaction preparation into their lending programs. Typical PPP transactions would entail joint investment in supply chain infrastructure with qualified strategic investors in return for facility management, cost sharing and facility capacity sharing commitments on the part of private co-investors. Examples include the development in East and West Africa of bulk fertilizer import terminals, storage and bagging facilities and linked inland depots all designed as a regional distribution network to support the development of an efficient regional market for fertilizer.

Other examples might include the development of port centered EPZ’s, designed to be supply chain compatible and industrial, cluster friendly. Still another example might include the development of “green intermodal corridors” anchored at one end by clusters of agricultural product assembly, and pack house operations at the other end by supermarket chain distribution centers. Green corridors like those being considered for development in Egypt allow farm products to be assembled into economic lots, primary processing to be carried out and good food security checks effected near the point of origin, before a full measure of transport and handling cost has been absorbed. At the destination end they facilitate the co-location of supermarket distribution centers and agro processing facilities and greatly improve the economics of urban goods distribution. More generally the following principles can be taken away from this study and applied to the design of projects which are intended to improve logistics efficiency.

**Reduce transaction costs and increase the certainties of buy-sell transaction completion.**

Simple and certain enforcement of the terms of standard waybills, contracts, warehouse receipts, and equipment interchange agreements are all essential to assuring that transactions are completed at minimal cost. Judicial, arbitration, and other dispute-resolution mechanisms involving commercial transactions should be fair, rapid, and predictable and conform to precedent. The basis on which benefits are managed and documented through the entire supply chain depends on correctly initiating trade and transport documentation in the first link of the chain. One important objective of institutional development, which supports efficient chains, should be the adoption of international precedents and trade facilitation protocols—and the development of institutional capacities to enforce these protocols. To this end, the World Bank has supported a project in Nepal designed to encourage adoption of multimodal bills of lading and other documentation standards for container shipments, which are uniform and consistent with international best practice. Similar projects have been designed and implemented in a number of other developing countries.
**Enlarge effective transport market scope.**

The deepening and broadening of local transport markets can increase competition significantly and lead to economies of scale in the consolidation of shipments, the creation of regional load centers, and the development of trans-national service networks. Hence, policies or infrastructure constraints that divide and separate national markets into separate franchises or service zones need to be removed. Price discovery mechanisms (e.g. regional truck haul brokerages and internet based agora), tracing and tracking systems and distribution systems need to be opened, expanded to include cross border movements, and offered as public services. Similarly, opportunities need to be undertaken to restructure rail and water based services into commodity based, strategic lines-of-business (LOB’s), which correspond to multimodal logistics service franchises for investment and private development. Such franchises would reach beyond the network of the base transport mode and would include multimodal transfer facilities, assembly points and bulk storage facilities specifically designed to support the distribution of grains, fresh fruits and vegetables, agricultural inputs, cement, other construction materials, etc. Toward these ends, the World Bank has helped to develop inland customs clearance depots to which international goods can be consigned and delivered in bond before customs inspection and clearance in China and elsewhere. Partnerships with the World Food Program (WFP) offer particularly attractive opportunities to address food security issues.

**Improve distribution network connectivity.**

Network connectivity means being able to move products at reasonable cost, and with effective control, from any production point within a service market to any consumption or redistribution point. The three keys to improving network connectivity are: (1) enhancing logistics information services, (2) developing intermodal transportation services which apply cost effective, third generation intermodal technologies such as Rail Runner and/or Road Railer, and (3) making infrastructure investments in inland transshipment and multimodal transfer stations, farm to market cold chains, transit facilities and bonded warehouse storage facilities managed by commodity exchanges. Intermodal and multimodal transportation, in particular, offer breakthrough opportunities for improved transport network connectivity. To illustrate this point, the intermodal subsidiary of India Railways—CONCOR—has grown tremendously since its inception in 1992, to become the largest provider of rail/truck coordinated services on the Indian subcontinent. As CONCOR expands its reach via other railways within the region, connectivity and coordinated intermodal services offered under a door-to-door bill of lading will become increasingly available. New intermodal transport technologies like Rail Runner and Road Railer allow the cost effective extension of existing rail networks at low marginal network extension cost. Even more importantly, they allow private shippers, and their third party agents, to solve their own logistics and transport problems when third party carriers fail to solve them.

**Facilitate competition both within and between supply chains.**

Market entry constraints on third party logistics service providers need to be removed as do constraints on own provided logistics services on the part of MNC’s. The greater the diversity of supply chain business models, and the more intense the competition among supply chain investors/developers, the more likely is a developing economy to afford an attractive investment platform for manufacturers/agribusinesses/extractive mineral and energy investors. To this end, tax, business licensing, investment and labor market conditions need to be equalized between foreign and local third party logistics service providers. Third-party service providers not only serve as the primary lynch pins in global supply chains, as discussed above, but also, as risk arbitrageurs in many supply chains. They help, for example, to liquidate excess inventory and to achieve full utilization of underutilized transport capacity. Most importantly, they are the most effective
agents for transferring supply chain management technology and management techniques from developed to developing countries.

**Develop and equitably enforce light landed regulation over third party service providers.**

Regulatory regimes need to be developed for third party logistics service providers which provide buyers with some assurance that the competencies, skills and advertised capabilities of third party service providers are genuine. To this end, professional certification of individual logistics management professionals working for specific service companies together with their periodic retesting and recertification is preferable to the special licensing of individual service enterprises. In addition, the basis upon which the sale price of goods can—and cannot—be differentiated among buyers needs to be defined, so that opportunities for price discrimination based on considerations other than real transport and handling costs, can be minimized. Normative legal standards need to be clarified for franchising and for enforcing other types of exclusive distribution channel agreements. Careful consideration, too, should be given to prohibiting cross ownership or control between modes of transport including railways, port terminal operations, and related distribution-based activities.

**Develop professionalism and skills in logistics management.**

Professional managers design effective supply chains and integrate multiple service suppliers into seamless distribution systems. Thus, professional development represents one of the most productive investments that can be made within a national economy. Managers require practical knowledge of what is possible and what skills require refinement in order to manage the integration of business processes across national and enterprise borders. Multinational corporations provide a valuable window on international best practice and a channel for transferring proven skills. Professional associations and educational institutions play a valuable role in reinforcing professional values and developing a credo of ethical and fair dealing, which is the bedrock of efficient supply chain operations. An example of professional development is the training program organized by UNCTAD in Nepal and in Tanzania in order to upgrade the skills of freight forwarders and logistics managers and to "raise the bar of competence" to the level of international best practices.

**Facilitate movements across national borders.**

Costly and time-consuming impediments to the movement of freight across borders need to be eliminated. Integration and streamlining of customs processes and procedures not only will increase revenue to the government, but they also will facilitate trade. In particular, fair and open reciprocal rights can help reduce distribution costs significantly. New treaties negotiated between Nepal and India and between Nepal and Bangladesh, for example, show how borders can be made more commercially friendly. Formerly, containerized freight moving between Calcutta and Katmandu was inspected three times and loads were transferred from Indian trucks to Nepalese trucks at the border. Both the number of customs inspections and the need for transfer of transit loads are in the process of being reduced.

**Enable the creation and distribution of accurate information.**

Supply chain management increasingly involves the distribution of information among trading partners on a need-to-know basis. Most importantly, this includes the standardization of information exchange protocols and documents that enforce buy/sell/deliver contracts. The creation of specialized community cargo systems and Electronic Data Interchange (EDI) networks managed by third parties can go far in supporting seamless supply chains. Logistics information systems are most useful when they link an entire network of trading partners and serve multiple information requirements.
The Internet is an ideal vehicle for commercial communication between buyers and sellers. Valuable opportunities exist to develop hub-and-spoke supply chains around the basic information requirements of customs services, railways, or port authorities.

As trade and commerce become increasingly globalized, it is critical to raise the competencies and develop the service culture of all economies. This is why the World Bank believes that the kinds of supply chain investments being made in developing economies are so important. Through supply chain infrastructure development projects, developing countries not only will improve their internal supply chain processes, but they also will enhance trade opportunities with their neighbors in the region—and potential trading partners around the world.