

International Supply Chain Management

Before presenting the different aspects of international logistics, it is useful to understand how this function is currently included in the management of a firm engaged in international business. It is essential for the international logistician to understand the responsibilities of that profession and the interactions that this function has with the other operational functions of a firm, such as marketing, finance, and production.

Over the years, the responsibilities of an international logistics manager have evolved substantially. This chapter introduces a brief history of the development of the profession of international logistician, the evolution of the activities that have become his or her responsibility, and the current status of this managerial position. It should be made clear that the responsibilities of an international logistician are still changing; it is not known whether the profession will eventually include a greater number of activities or whether its responsibilities will be curtailed, especially in the light of the creation of Supply Chain Management.

2.1 HISTORICAL DEVELOPMENT OF INTERNATIONAL LOGISTICS

2.1.1 The Early, "Slow" Days

The globalization of markets is generally understood to be a recent phenomenon, triggered by the economic development explosion after World War II; however, while international trade has certainly increased dramatically in the second half of the last century, nations have engaged in international trade for eons. However, before the twentieth century and the advent of modern transportation, trade between nations had always relied on courageous traders who ventured in faraway places in the hope of earning a living. They were responsible for determining what goods they should take along as payment for the goods they hoped to bring back, negotiating with foreigners with whom they did not share a language, and arranging for the transportation and safekeeping of the goods while in transit. They were exposed to the risks of international travel, of market preferences, and of political instability. They were mostly adventurers and pioneers.

Can these early traders be considered to have been the first involved in international logistics? Undoubtedly. The word "logistics" comes from the Greek *logistike*, which translates as "the art of calculating" ¹ using concrete items, in contrast with *arithmetike*, which was the art of calculating using abstract concepts.

The latter eventually evolved into the modern concepts of arithmetic and algebra. The first gave birth to the modern term of "logistics," which has evolved into the art and science of determining eminent aspects of business management, from transportation and packaging to warehousing and inventory management.

The first international traders were involved in logistics; they calculated how much their ships—beasts—could carry, how much food to bring along, and how best to package the goods while in transit. They had to decide which payment method was most appropriate, just as a modern exporter must determine what is the best way of ensuring they will get paid. While many aspects of international logistics have changed, the main concerns of people involved in this field remain similar; they have to ensure that goods manufactured in one part of the world arrive safely to their destination.

However, the modern interpretation of the term "logistics" has its origins in the military, where it is used to describe the activities related to the procurement of ammunitions and essential supplies to troops located at the front. It gave birth to the title of *Maréchal des Logis* in the French military, which is given to a sergeant in charge of a unit's supplies and housing. Interestingly enough, when the term applies to the branch of the military in charge of logistics on a large scale, the French use a different word altogether: "*le train*."

Initially, therefore what was understood as "business logistics" was based on the military concept and encompassed mostly the physical movement of goods (1970s). The term is now much broader and includes not only all the activities related to the physical movement of goods, both upstream (procurement activities) and downstream (sales) activities, but also the management of some of the relationships with suppliers and customers.

Over the last thirty years, the focus of logistics has evolved substantially: Early on, and probably until the mid-1980s, the main concern of logistics managers and specifically of international logistics managers, was to make sure that the goods arrived at their destination in good condition and at the lowest possible cost. Shorter transit times were considered, but generally only when the goods were perishable because the goods were so urgently needed that the additional costs were justified; for most goods however, long transit times were essentially considered normal. As time moved on, a transition was made to shorter transit times.

2.1.2 The Move Toward Speed

Containers—"boxes" in the logisticians' vernacular—changed the focus of international logistics. Even though they were introduced in 1956, containers had a limited impact on international trade until the early 1970s.

Before containers, the process of shipping internationally by ocean was cumbersome and very time-consuming. The traditional method was to first pack the goods into a truck or a railroad car for the inland trip to the port. The goods were then unloaded in the port and loaded onto a ship using cranes and slings, as well as a large number of longshoremen who stowed them appropriately for their ocean voyage. The goods were then unloaded again in the port of arrival, loaded again in a truck or railroad car for the inland trip, and finally unloaded at their destination. Packages had to be small to accommodate being handled by humans in the ship's holds, and very sturdy to withstand their being handled numerous times. A transatlantic shipment took in excess of one month, the majority of that time spent in the ports.

With the advent of containers, shipments began to speed up. Instead of loading and unloading the goods several times, containers were loaded once in the shipper's plant and unloaded once at the customer's facilities. Packaging did not have to be as sturdy. Ship loading and unloading operations were much faster. Ships no longer had to be completely empty to load new cargo; as soon as a stack was empty, the crane

could unload containers from the ship, place them on a waiting truck, and, instead of returning to the ship "empty," could immediately pick up another container to be loaded onto the vessel. The costs of ocean shipping came down: Port labor costs were lower, ships were more productive because they spent less time idling in ports, and some significant investments were made in new container ships that were ever more efficient.

Only a few years later, in the late 1970s and early 1980s, international logistics saw an explosion in the number of air shipments. Even though DHL had been founded in 1969 and Federal Express in 1973, neither of these services provided much coverage: DHL was strictly a San Francisco-Honolulu service until 1974, and Federal Express had only twenty-five domestic destinations until 1979. However, Federal Express sales rose quickly and by 1983, it had become a billion-dollar corporation strictly based on domestic shipments. It started international operations in 1984, and, by 2005, it had changed its name to FedEx, and became a \$30 billion corporation. In the United States, the term "fedex" has become a verb.

The costs of air shipments also dropped considerably during this period. In the beginning, Federal Express operated with Dassault's Falcon jets, which had limited cargo capacity. By the end of the 1970s, after a partial deregulation of the industry, it had acquired Boeing 727s and McDonnell-Douglas DC10s, which had much greater capacity. Further deregulation in the 1980s and open-sky agreements in the 1990s increased the number of aircrafts dedicated to freight, and air shipments became increasingly cost competitive with surface alternatives.

2.1.3 The Emphasis on Customer Satisfaction

By the early 1990s, the increased speed of ocean shipments and the availability of affordable airfreight services had effectively changed the focus of logistics managers: They began to consider the shortest reasonable transit time in response to customers' request for speedy deliveries. Although it was still very important to make sure that the goods arrived in good condition and at the lowest possible cost, the managers' focus had shifted from these process-oriented concerns to the satisfaction of customers' requirements.

The major reason behind this change of objectives in the management of logistics was the increased focus by large manufacturers on the reduction of inventories during the 1980s. Starting in the mid-1970s, but culminating in the early 1980s, interest rates climbed to unprecedented heights, triggering a concern about all the money immobilized in inventories. In the 1980s, companies emphasized reductions in their "static" inventories, or the goods they kept in their warehouses or plants. By the early 1990s, they had shifted their attentions to their "mobile" inventories, or the goods that were in transit between two of their plants or between their suppliers and their plants. The tools they used were **Materials Requirement Planning (MRP)** and **Manufacturing Resources Planning (MRP II)**, which allowed them to create **Just-In-Time** manufacturing processes. In turn, these processes triggered a need for "time-defined" deliveries of assembly parts; plants demanded to have parts delivered just before they were used on the assembly line, and not later. The number of goods that were "in transit" had to be curtailed as well.

By the mid-1990s, all manufacturers had adopted such techniques and were requiring their suppliers to ship just-in-time. At the same time, large retailers and other distributors jumped on the same idea. They started to use techniques derived from MRP and MRP II, which they called **Distribution Resources Planning (DRP)** techniques, which used final consumer sales data to "pull" products through the distribution channel. Consumer sales data were collected through the point-of-sale (POS) scanners. If the products were selling briskly, then the DRP program reordered the goods from the manufacturer and had them delivered just-in-time to the appropriate warehouse or retail store. If a product did not sell well, none were ordered again. This strategy forced logistics managers to shift their attention to transit times and to become adaptable to frequent changes in their work. This came to be known as "agile logistics."

Today, the requirements of most manufacturers and large retail chains are such that they penalize financially the suppliers that do not deliver on time (too early or too late) by withholding a portion of invoice at the time of payment.

It is fair to say that customer satisfaction is now the primary concern of logisticians: Not only does shipment have to be accurate (the right parts, in the right quantity), complete (no back-ordered parts), the packaging appropriate so that the goods arrive undamaged and ready to be sold, but it must also be delivered within a very specific time frame.

While international logisticians must make sure that the shipment is accurate, complete, and arrives on time, they also have many additional responsibilities. They must make certain that their shipment paperwork is in perfect order so that it can clear Customs without delay. They must make sure that the packaging is sufficient to protect the goods during their long (and often eventful) international voyage. They must ensure that they meet a myriad of security requirements and must manage the intricacies of a transaction involving different currencies and different laws. They must choose the right mode of transportation and must make sure that the goods are properly insured. In short, they have many challenges with which to contend for each shipment.

2.2 DEFINITIONS OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

As the fields of logistics and international logistics evolved, the managers working in those fields changed the definitions that they used to describe their profession. Whereas "logistics" was the most commonly accepted term for all of the activities in which they engaged, the term was broadened, starting in the mid-1980s, to include additional activities; eventually, the profession was renamed "supply chain management" in the 1990s. Today, the term "logistics" is understood to encompass a number of activities that are a subset of the activities that constitute Supply Chain Management.

2.2.1 Logistics

As it stands today, the term "logistics" is defined by the professionals in the field as:

Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.²

From this definition, it is clear that logistics managers see that the focus of their profession lies in the activities that are related to the *physical aspects* of the movement of goods from supplier to customer. Logisticians are mostly concerned about the transportation, packaging, warehousing, security, and handling of goods that their firm purchases or sells, and they interact daily with managers who hold other responsibilities closely related to the movement of these goods; manufacturing and production, purchasing and procurement, marketing, inventory management, finance, customer service, and so on.

Figure 2-1 summarizes a slightly different opinion of the evolution of logistics, as seen by Alfi Battaglia.³ In his view, the logistical function of a company came to include the management of materials and manufacturing somewhat earlier than the 1990s. What is clear is that most logistics professionals referred to their profession as "Supply Chain Management" by the early 2000s.

2.2.2 Supply Chain Management

In an international survey of logistics educators that was conducted in 2001, Larson and Halldorsson⁴ found that there were four different viewpoints regarding the relationship between logistics and supply chain management, three of which are shown in Figure 2-2.

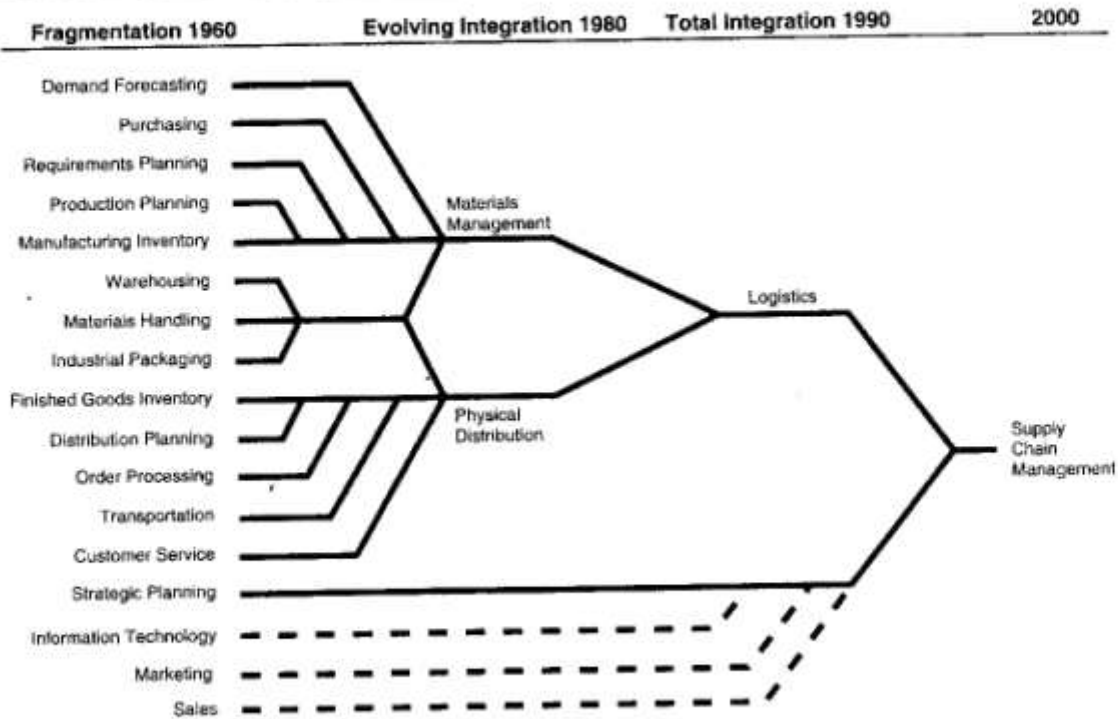


Figure 2-1 The Evolution of Logistics

Source: Diagram © Alfred J. Battaglia. Used with permission. Reproduced by Natalie David.

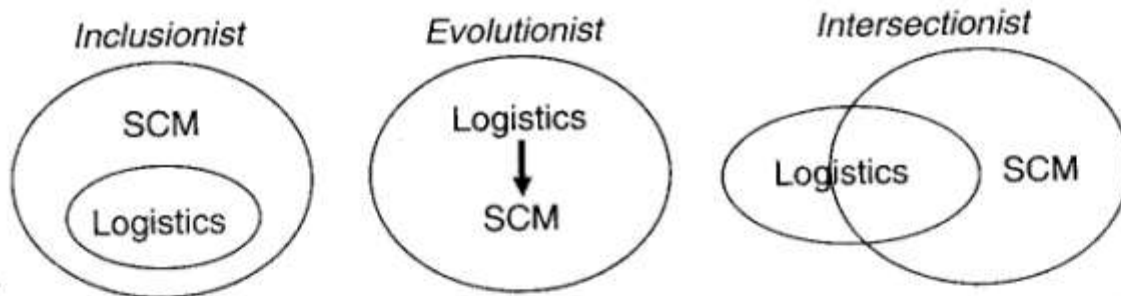


Figure 2-2 Three Different Perspectives on the Relationship between Logistics and SCM

Source: Adapted from Larson and Halldorsson. Reproduced by Natalie David.

Nevertheless, it seemed that by 2004, the “inclusionist” viewpoint had prevailed, as the Council of Logistics Management changed its name to the Council of Supply Chain Management Professionals (CSCMP) to reflect what was perceived as the broader nature of the field, and produced a definition of the term “supply chain:”

Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies.

The most significant characteristic of this definition is that it reflects an extension of the concept of logistics to that of supply chain management. In the view of the CSCMP, the shift from logistics to supply chain management was a shift from an internal focus on the company’s own processes to an external focus that includes all the firm’s partners. The scope of Supply Chain Management is therefore much broader than

the scope of logistics; not only does it include all of the tactical and managerial decisions on which logistics and operations managers tend to focus, but it also includes strategic issues that are more traditionally domain of the managers in those top management positions that are now colloquially referred to as "level" positions (CEO, Chief Executive Officer, CFO, Chief Financial Officer, COO, Chief Operating Officer, and so on). Several companies have created positions of Chief Supply Chain Officers, and magazine *Chief Supply Chain Officer* was launched in February 2005.

2.3 DEFINITION OF INTERNATIONAL LOGISTICS

The role of international logistics in the global supply chain mirrors that of logistics in the domestic environment: International logistics professionals focus on the tactical aspects of the global supply chain; those activities that are inherent to the movement of goods and paperwork from one country to another; those activities that constitute the basis for export and import activities and operations.

The definition of logistics provided by the Council of Supply Chain Management Professionals can therefore be logically modified to define international logistics by including the elements of the international environment:

International logistics is the process of planning, implementing, and controlling the flow and storage of goods, services, and related information from a point of origin to a point of consumption located in a different country.

The emphasis of international logistics is therefore on the creation of internal processes and strategies. These processes and activities are the focus of this textbook.

2.4 DEFINITION OF INTERNATIONAL SUPPLY CHAIN MANAGEMENT

A characteristic of supply chain management is that it is inherently global in nature; just about every company outsources some percentage of its production abroad or sells to customers who are located abroad. If it does not, its suppliers or customers do. In 2006, *Forbes* Magazine reported that the percentage of the content of the quintessential American car (the Ford Mustang) that was made outside of the United States stood at 35 percent. In contrast, the Toyota Sienna, a Japanese minivan sold in the United States, was made of 90 percent American parts.⁵

It is not clear why the Council of Supply Chain Management Professionals did not include this global aspect of supply chain management in its definition. The Council's definition should more accurately read:

Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers, whether they are located in the United States or abroad. In essence, Supply Chain Management integrates supply and demand management within and across companies.

Figure 2-3 outlines the current state of the relationships among logistics, international logistics, and supply chain management as of 2006. The activities included in the logistical function are those that include physical transportation of the goods from the supplier(s) to the company and from the company to its customer(s). Logistics also includes the warehousing and other inventory functions within the company that involve the products it purchases, manufactures, and sells.

International logistics works in a parallel form for foreign suppliers and customers. It includes additional activities, such as Customs clearance, documents handling, and international packaging, but the main function of international logistics is concentrated on the physical movement of goods from suppliers to the

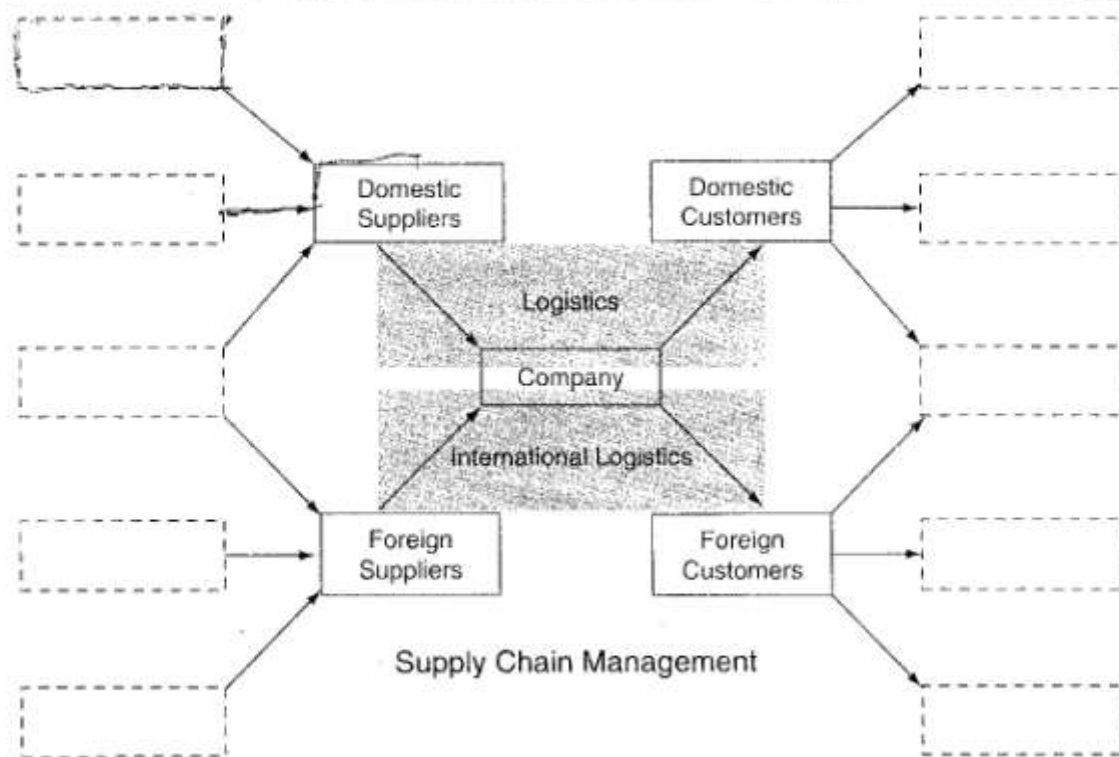


Figure 2-3 *Logistics, International Logistics, and Supply Chain Management*

Source: Diagram by Natalie David. Used with permission.

company and from the company to its customers. The fact that they are in an international arena makes fulfilling these activities much more complex.

Supply chain management is a much broader term; it includes both the domestic logistics and the international logistics functions, but it is also the management of the relationships with suppliers and customers (domestic or foreign) and, to some degree, of their relationships with their suppliers and customers. It deals with the entire supply chain, attempting to manage a smooth flow of goods from the first supplier to the ultimate customer. A possible example of a supply chain management activity is the management of quality by the large U.S. Original Equipment Manufacturers (General Motors, Ford Motor Company, Daimler-Chrysler, and General Electric), that implemented QS-9000, which includes a process by which they certify the quality function of their direct suppliers (called tier-one supplier), of these suppliers' suppliers (called tier-two), and of these firms' suppliers (called tier-three).

2.5 ELEMENTS OF INTERNATIONAL LOGISTICS

There are only a few activities that are exclusively specific to international logistics; however, the traditional logistical activities are managed differently in an international environment than they are in a domestic environment.

- ♦ The environment involved in international logistics is quite important. While there is obviously the issue of language and culture—neither of which should be underestimated, but which are more appropriately covered in an intercultural management textbook—the physical environment of international logistics is quite distinct. The differences in the infrastructure of international logistics and the challenges they represent are covered in Chapter 3.
- ♦ The decisions regarding international transportation are eminently more complicated. Because of the distances involved, there are different modes of transportation, different carriers, different

transportation documents, and much greater transit times. Chapters 11, 12, and 13 cover these transportation alternatives.

- ◆ The number of intermediaries involved is greater. Banks, insurance companies, freight forwarders, not to mention the governments of the exporting country and of the importing country, all have different paperwork requirements. Chapter 9 covers the multitude of documents that are utilized in international trade.
- ◆ The inherent risks and hazards of international transportation are much more significant. In order to protect the goods while they are in transit, the logistics manager must have a good understanding of the packaging options that are available. Chapter 14 covers the choices and decisions surrounding packing for international transport.
- ◆ International insurance is much more complex. The contracts sometimes are written using archaic language and terminology that varies in meaning depending on the country in which the insurance company is located. Chapter 10 presents the different types of insurance coverage available in an international environment.
- ◆ International means of payment are more involved. The risks of nonpayment and currency fluctuations call for specific strategies that are never used in domestic transactions. Chapter 7 explains the different alternative means of payment and Chapter 8 presents the methods used by international traders to protect themselves against the risks presented by currency fluctuations.
- ◆ Terms of trade are much more complicated, as the greater number of nodes and links increases the number of possible alternatives for transfer of responsibility and ownership. The terms of trade used in international sales—the Incoterms of the International Chamber of Commerce—are presented thoroughly in Chapter 6.
- ◆ The crossing of borders represents specific challenges. Products sold abroad or purchased from abroad have to go through Customs, a complicated and paper-intensive process in most countries. The procedures involved in such a process are described in Chapter 15. In addition, when conducting business with foreign firms, issues arise in the contracts of sale, distribution agreements, and other legal documents. Chapters 4 and 5 present the options available to a firm engaged in international trade.
- ◆ Inventory is managed differently, as the risks of delays and variations in shipping times are increasing the challenges of Just-in-Time production. Safety stocks should therefore be created using slightly more complicated algorithms; a good primer on such methods can be found at <http://www.international-logistics.info> or in a good inventory management textbook.⁶

2.6 THE ECONOMIC IMPORTANCE OF LOGISTICS

In a yearly study of domestic logistics, Rosalyn Wilson calculates the percentage of the United States' Gross Domestic Product (GDP) that is spent on logistical activities (transportation, inventory, and other administrative costs linked to logistical activities). That percentage stood at 8.5 percent in 2004, but increased to 9.5 percent in 2005 due to increased interest rates and rising fuel costs.⁷ Collectively, American businesses spend close to U.S. \$1.2 trillion on domestic logistical activities.

Until 2005, though, logistical costs had been steadily decreasing as a percentage of GDP: While their share of the GDP was traditionally in the mid-teens in the 1960s and 1970s—with a high of 16.2 percent in 1982—they have steadily declined since the 1990s, as shown in Figure 2-4.⁸ This decrease is mostly due to corporations becoming more efficient in their use of inventory; the advent of Just-in-Time, Manufacturing Resources Planning, and their subsequent derivatives have decreased inventory levels from 24 percent of the United States' GDP in 1981 to 14 percent in 2004⁹ and 14.1 percent in 2005.

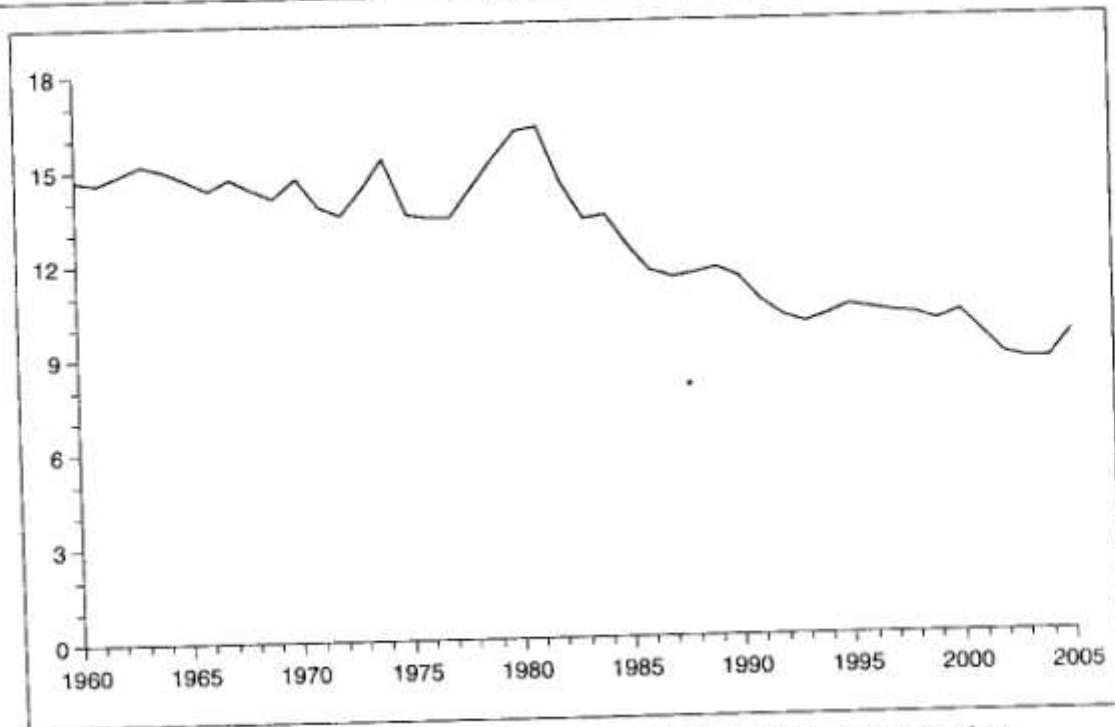


Figure 2-4 *Logistics as a Percentage of U.S. Gross Domestic Product*

Some of this decrease can also be attributed to more efficient means of transportation—for example, the increased use of containers—and to the deregulation of the U.S. transportation industry, especially during the 1980s and early 1990s.

However, since the late 1990s, the costs of transportation have been slowly rising; increased fuel costs, a shortage of truck drivers, additional security costs, and a transportation infrastructure stretched to its limits have considerably increased what businesses spend collectively on transportation. Transportation costs rose 15.2 percent from 2004 to 2005, and represent 6 percent of the GDP of the United States.

2.7 THE ECONOMIC IMPORTANCE OF INTERNATIONAL LOGISTICS

While there are no comprehensive data illustrating the total value of international logistics activities, it can be conservatively estimated that the percentage spent on international logistics activities would be around 15 percent of the total volume of international trade. Because the total value of the world's merchandise trade is U.S. \$9.5 trillion, the total expenditures on international logistics is approximately U.S. \$1.4 trillion. This estimate takes into account the fact that the logistical infrastructure of the North American continent is particularly efficient and that international logistics activities are typically more cumbersome and costly due to less efficient infrastructures and procedures, as well as longer distances.

There is one aspect of international logistics, though, that distinguishes it from domestic logistics regarding its impact on the world's economy; not only are the profits of corporations involved in logistics taxed by their respective governments, but international trade also generates a considerable amount of additional government revenues, as most imports are subject to tariffs. A very conservative estimate of the "value" of duty collection and other taxes directly linked to international trade would be about 5 percent of the world's merchandise trade. International logistic activities therefore generate approximately U.S. \$500 billion in additional government revenues.

Review and Discussion Questions

1. What are the elements that differentiate international logistics from domestic logistics?
2. What are the principal distinct components of international logistics?
3. What are the major costs of international logistics? Given what you read in Chapter 1 about the World Trade Organization, what trend do you expect these costs to follow?
4. MRP and DRP have allowed manufacturers and retailers to carry less and less inventory. What consequences would a major snowstorm or disruption of transportation have on such Just-In-Time management systems?
5. Describe the impact of international trade on your own life, using the products that you own or have purchased in the recent past.