CONGRESSIONAL BUDGET OFFICE
U.S. Congress
Washington, DC 20515

March 29, 2006

Honorable Norm Coleman
Chairman
Permanent Subcommittee on Investigations
Committee on Homeland Security and
Governmental Affairs
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

In response to your request about the economic effect of disruptions to the flow of container shipments at major U.S. ports, the Congressional Budget Office is issuing the attached analysis, *The Economic Costs of Disruptions in Container Shipments*.

The details of CBO's response are contained in the attachment. If you have any questions or need further information, please feel free to call me, at (202) 226-2700, or Joseph Kile, the staff contact for this work, at (202) 226-2940.

Sincerely,

Donald B. Marron

Donald B. Marron
Acting Director

Attachment

cc: Honorable Carl Levin
Ranking Minority Member

Honorable Susan M. Collins
Chair
Committee on Homeland Security and Governmental Affairs

Honorable Joseph I. Lieberman
Ranking Member

The Economic Costs of Disruptions in Container Shipments

March 29, 2006

The Congress of the United States ■ Congressional Budget Office

Notes

This report was written by Bruce Arnold, Craig Cammarata, Dick Farmer, Kim Kowalewski, Fatimot Ladipo, Mark Lasky, and David Moore of the Congressional Budget Office (CBO), under the supervision of Robert Dennis and Joseph Kile. Technical advice and helpful comments on an earlier draft were provided by Peter Hall of the University of Waterloo, William D. Nordhaus of Yale University, and Nouriel Roubini of New York University. (The assistance of external reviewers implies no responsibility for the final product, which rests solely with CBO.) In keeping with CBO's mandate to provide objective, impartial analysis, this report makes no recommendations.

Unless otherwise indicated, all estimates of the economic costs of a port closure are in 2006 dollars.

Numbers in the text, tables, and figures may not add up to totals because of rounding.

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Introduction and Summary

The security threat posed by the nearly 16 million shipping containers that arrive each year at U.S. ports is a major concern for policymakers.[1] That concern is partly motivated by the loss of life and damage to property that could occur from a terrorist attack using incoming containers. Another source of concern is the potential loss to the economy if one or more major U.S. ports were shut down for any length of time.

Roughly one-quarter of the United States' imports and one-sixth of its exports—or about $423 billion and $139 billion worth of goods, respectively, in 2004—arrive or depart on container ships. Containerized imports include both finished goods and intermediate inputs, some of which are critical to maintaining U.S. manufacturers' "just-in-time" supply chains. Such supply chains have been widely adopted, but they can leave manufacturers vulnerable to disruption if a necessary part does not reach an assembly plant in time. The lack of key parts could reduce output, employment, and income for individual companies by amounts larger than the value of the delayed part—and in areas and businesses far removed from the port where a disruption occurred. Although concerns about disruptions in the flow of container traffic focus on terrorist attacks, similar economic losses could result from extreme weather or labor disputes that affected port operations or from disruptions elsewhere in the supply chain.

At the request of the Permanent Subcommittee on Investigations of the Senate Committee on Homeland Security and Governmental Affairs, the Congressional Budget Office (CBO) analyzed the national economic costs of disruptions in container traffic, regardless of their cause. This report summarizes the structure and economics of the U.S. port industry and container traffic, estimates the economic cost of various disruptions in that traffic, and discusses how such disruptions might affect the economy.

As requested by the Subcommittee, the analysis focuses on two specific disruption scenarios:

- An unexpected one-week halt to all container traffic through the ports of Los Angeles and Long Beach, California, the country's two largest ports for such shipments; and

- An unexpected three-year halt to all container traffic through those two ports as well as an initial precautionary one-week stoppage of container shipments at all U.S. ports.

1. That estimate of annual incoming container traffic is measured in 20-foot equivalent units, or TEUs (the amount of cargo that fits in a 20' x 8' x 8' container), and comes from U.S. Maritime Administration, *Containership Market Indicators* (August 2005), available at www.marad.dot.gov/MARAD_statistics/2005%20STATISTICS/Container%20Market%20Indicators.pdf.

CBO's analysis of those scenarios provides rough estimates of the costs to the U.S. economy of disruptions in container traffic. Although in 2004 approximately $500 million worth of containerized imports flowed into the ports of Los Angeles and Long Beach each day, the loss in production (gross domestic product, or GDP) from a one-week shutdown of those ports would probably be less—between $65 million and $150 million per day.

Daily costs would be at least that large in the case of a three-year closure of those ports and an initial one-week stoppage of container movement at all U.S. ports. Simulations commissioned by CBO suggest that the three-year shutdown would reduce real (inflation-adjusted) GDP by between 0.35 percent and 0.55 percent, or $45 billion to $70 billion, per year.[2] That reduction translates into daily costs ranging from $125 million to $200 million.

Spending by consumers and businesses would fall substantially more than that during the shutdown. The reason is that consumers and businesses would spend less on both imported goods and domestically produced goods, but the decline in real GDP reflects only reductions in domestic production. Inflation, as measured by consumer prices, would be higher in the first year (by about 2 percentage points) than it would have been otherwise, little changed in the second year, and lower thereafter, eventually bringing the level of consumer prices back to where it would have been without the disruption. Employment would be an average of about 1 million jobs lower during the three years of the shutdown, according to the simulations.

The estimates for a short closure of the Los Angeles and Long Beach ports would also apply to a shutdown of one or more foreign ports if comparable flows of trade were affected. Of particular interest is the trade flowing through the word's largest ports, which are predominantly in Asia. However, Asian exporters seeking to move goods to the United States would most likely have more alternatives for rerouting shipments than would U.S. importers seeking to receive goods through West Coast ports. Thus, a disruption in port activity of a similar scale in Asia would have a smaller effect on the U.S. economy.

The estimates presented in this report are for the U.S. economy as a whole. They do not focus on distributional effects. When shipments are diverted from one port to another—as would occur if the Los Angeles and Long Beach ports closed for a long period—income and jobs would shift with them. From the perspective of the national economy, gains elsewhere would offset some of the losses in the directly affected area. But that economic activity would not produce income for the workers employed by, or returns on the capital invested in, the ports of Los Angeles and Long Beach. Similarly, firms—particularly those with the lean supply chains characteristic of just-in-time production—would be forced to reduce their output in some scenarios. How-

2. As discussed below, the simulations were conducted by Inforum (a nonprofit research organization affiliated with the University of Maryland) using its LIFT economic model, with assumptions supplied by CBO. For more details about the estimating methods, see Appendix A.

ever, other firms that had different supply chains or that produced competing goods or entirely different products might increase their output. The cost to the national economy of a disruption would reflect the losses of some firms and the gains of others.

These estimates are not based on an analysis of specific bottlenecks that could arise because of a manufacturer's reliance on just-in-time inventories. CBO lacks information about which companies and industries control their inventories in that way and about whether they do so for goods that would be shipped in containers through Los Angeles and Long Beach. However, there are reasons to suspect that bottlenecks due to just-in-time inventories would not have a large impact on these estimates. The manufacturers that use such inventory-control methods are likely to be the ones with the most sophisticated logistics systems, and thus they may be in the best position to find alternate supply routes on short notice. In addition, most of the containerized imports that arrive at the Los Angeles and Long Beach ports appear to be finished goods, not intermediate inputs. Thus, the main loss from a shutdown would be a loss of final sales, which CBO's analytic methods measure adequately.

U.S. Ports and Merchandise Trade

Ports are a gateway for imports and exports of both finished and intermediate goods. In 2004, nearly $1.5 trillion worth of goods were imported to the United States, and $0.8 trillion of U.S. goods were exported to other countries. Almost half of the imported goods arrived by sea (see Figure 1). The United States is home to about 360 commercial ports, but just 20 handle more than 80 percent (by total value) of goods imports and exports. Moreover, the largest three ports—Los Angeles, New York, and Long Beach—handled about 40 percent of the U.S. imports that arrived by water in 2004 (see Table 1).

Container Shipping

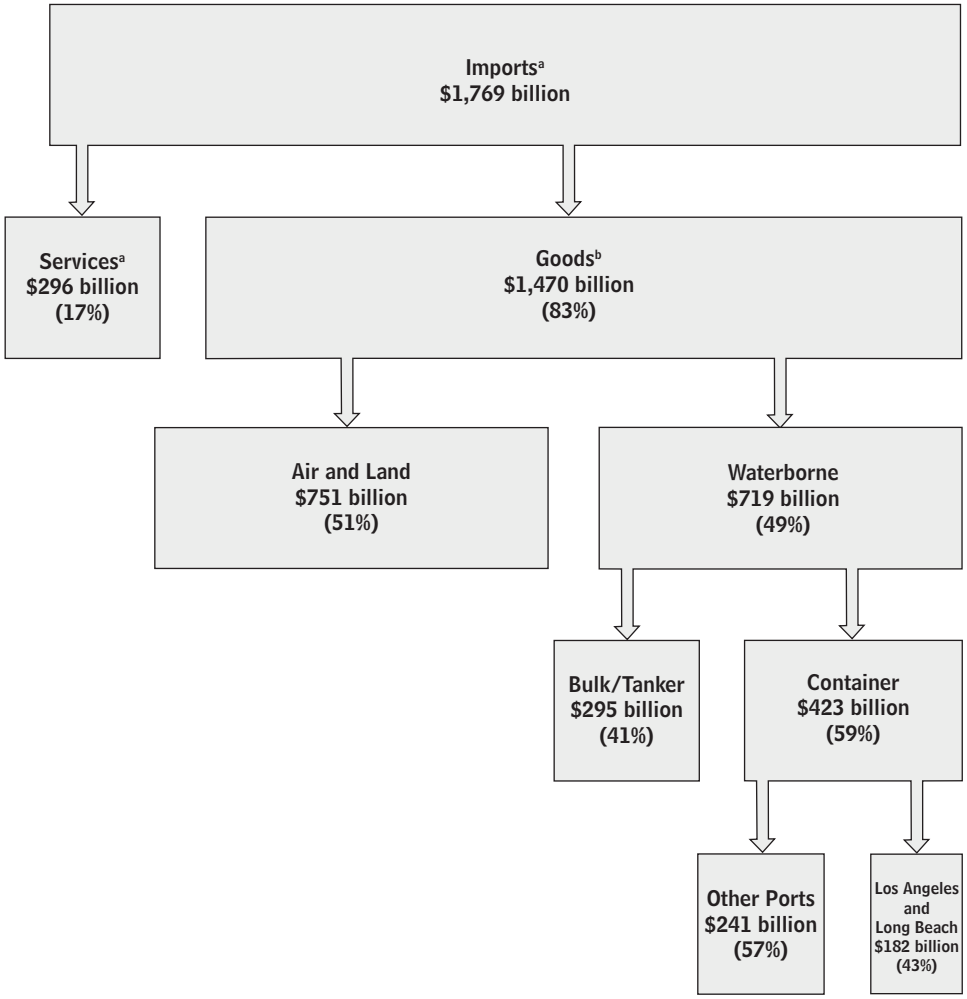
A growing share of waterborne imports travel by container ship. Such ships come in several sizes; the largest that now call at U.S. ports carry more than 8,000 containers.[3] Containers allow for standardized handling and shipping practices and integration with rail and truck distribution networks. Those factors give container shipping a cost advantage for many goods. Container traffic has been growing steadily in the past decade, reflecting growth in international trade and changes in the economics of transport by sea relative to other modes.

Container ships tend to carry items that are relatively high in value per unit. In 2004, containerized imports arriving at U.S. ports were valued at a total of $423 billion, or almost one-quarter of the value of all U.S. imports. Containerized exports from U.S. ports that year had a total value of about $139 billion.

3. Yvonne Smith, "Executive Overview: Pacific Maritime," *World Trade* (February 25, 2006), available at www.worldtrademag.com/CDA/Articles/Feature_Article/2006d39c1fd99010VgnVCM100000f932a8c0.

Figure 1.

U.S. Containerized Imports in Perspective, 2004



Source: Congressional Budget Office based on data from the Bureau of the Census, Foreign Trade Division; the U.S. Maritime Administration; and Bureau of the Census, *U.S. International Trade in Goods and Services: January 2006* (March 9, 2006), Exhibits 1 and 5.

Note: All data are customs values.

a. Total imports and services are reported on a balance-of-payments basis.

b. Goods imports are reported on a Census basis. For comparison, goods imports in 2004 were $1,473 billion on a balance-of-payments basis.

Table 1.

Top 20 U.S. Ports for All Waterborne Imports and Exports, by Value, 2004

(Billions of dollars)

Port	Value	Port	Value
Waterborne Imports		**Waterborne Exports**	
Los Angeles, California	130.7	Houston, Texas	29.1
New York, New York	90.2	New York, New York	23.1
Long Beach, California	74.8	Los Angeles, California	17.8
Houston, Texas	36.8	Long Beach, California	17.3
Charleston, South Carolina	30.8	Charleston, South Carolina	15.3
Baltimore, Maryland	24.4	Norfolk, Virginia	12.0
Tacoma, Washington	22.5	Savannah, Georgia	9.7
Seattle, Washington	22.4	New Orleans, Louisiana	9.6
Norfolk, Virginia	21.2	Oakland, California	8.7
Oakland, California	18.3	Miami, Florida	7.7
Philadelphia, Pennsylvania	16.6	Port of South Louisiana	7.6
Savannah, Georgia	16.3	Baltimore, Maryland	6.9
Morgan City, Louisiana	14.1	Seattle, Washington	6.8
New Orleans, Louisiana	12.6	Tacoma, Washington	5.3
Beaumont, Texas	12.0	Port Everglades, Florida	4.8
Miami, Florida	10.7	Jacksonville, Florida	4.5
Corpus Christi, Texas	9.9	Portland, Oregon	3.1
Jacksonville, Florida	9.2	Anchorage, Alaska	2.4
Portland, Oregon	9.1	Corpus Christi, Texas	2.0
Wilmington, Delaware	7.7	Tampa, Florida	1.7
Total, Top 20 Ports	**590.3**	**Total, Top 20 Ports**	**195.5**
All U.S. Ports	**718.7**	**All U.S. Ports**	**229.9**

Source: Congressional Budget Office based on information from the U.S. Maritime Administration.

Not all U.S. ports are equipped to accommodate container shipping. Different ports have very different unloading capabilities and handle different types of vessels. Ports on the Gulf Coast handle a large share of tankers and dry bulk cargo, whereas those on the East and West Coasts handle a large percentage of container traffic and vehicle shipping. Because of those differences, the economic consequences of closures at particular ports can vary greatly.

West Coast Ports

The West Coast is home to three of the top five U.S. ports for receiving containerized goods (ranked by value) and to the second- and third-largest ports for exporting them (see Table 2). The United States exports far fewer containers than it imports.

Table 2.

Top 20 U.S. Ports for Containerized Imports and Exports, by Value, 2004

(Billions of dollars)

Port	Value	Port	Value
Containerized Imports		**Containerized Exports**	
Los Angeles, California	118.7	New York, New York	19.5
Long Beach, California	63.5	Los Angeles, California	16.0
New York, New York	61.4	Long Beach, California	15.7
Charleston, South Carolina	24.2	Houston, Texas	12.1
Seattle, Washington	21.0	Charleston, South Carolina	10.9
Norfolk, Virginia	20.1	Norfolk, Virginia	10.4
Tacoma, Washington	19.6	Oakland, California	8.0
Oakland, California	17.7	Savannah, Georgia	7.8
Savannah, Georgia	12.8	Miami, Florida	5.9
Houston, Texas	11.3	Seattle, Washington	5.6
Miami, Florida	10.0	Tacoma, Washington	3.8
Baltimore, Maryland	9.5	Port Everglades, Florida	3.6
Port Everglades, Florida	4.9	New Orleans, Louisiana	3.2
New Orleans, Louisiana	3.2	Baltimore, Maryland	2.8
Philadelphia, Pennsylvania	3.1	Jacksonville, Florida	1.6
San Juan, Puerto Rico	2.5	Portland, Oregon	1.3
Gulfport, Mississippi	2.2	Gulfport, Mississippi	1.1
Boston, Massachusetts	2.0	Philadelphia, Pennsylvania	1.1
Portland, Oregon	1.8	San Juan, Puerto Rico	1.1
Chester, Pennsylvania	1.7	Chester, Pennsylvania	0.8
Total, Top 20 Ports	**411.3**	**Total, Top 20 Ports**	**132.3**
All U.S. Ports	**423.4**	**All U.S. Ports**	**139.3**

Source: Congressional Budget Office based on information from the U.S. Maritime Administration.

The ports of Los Angeles and Long Beach, both situated on California's San Pedro Bay, are the nation's busiest ports for containerized imports. In 2004, they handled 43 percent of such imports (by value), or more than $180 billion worth (see Table 3). Those imports accounted for just over 12 percent of the value of all goods imported into the United States. The value of containerized exports from Los Angeles and Long Beach was considerably smaller, just over $30 billion, and accounted for a smaller share of total U.S. containerized exports, about 23 percent (see Table 4). The relative importance of container traffic at Los Angeles and Long Beach is even greater on the West Coast, where those two ports accounted for two-thirds of the value of total container shipments in 2004 (see Figure 2). According to the Department of Transporta-

Table 3.

Top 20 Containerized Imports, by Value, 2004

HS#	Category of Import	Los Angeles and Long Beach Ports: Value (Billions of dollars)	Los Angeles and Long Beach Ports: Percentage of Total Containerized Imports of That Commodity	All U.S. Ports: Value (Billions of dollars)	All U.S. Ports: Percentage of Total Containerized Imports Nationwide
84	Machinery, Boilers, Reactors, Parts	38.0	50.7	74.8	17.7
85	Electric Machinery, Sound and Television Equipment, Parts	31.7	64.1	49.4	11.7
87	Vehicles and Parts, Except Railway or Tramway	12.1	39.3	30.8	7.3
61	Apparel Articles and Accessories, Knit or Crochet	9.0	39.1	23.1	5.5
62	Apparel Articles and Accessories, Not Knit or Crochet	9.9	44.0	22.5	5.3
94	Furniture, Bedding, Lamps, Etc.	9.3	48.4	19.3	4.6
95	Toys, Games, and Sports Equipment and Parts	9.4	55.8	16.9	4.0
64	Footwear	7.8	56.0	13.9	3.3
39	Plastics and Articles Thereof	5.2	41.1	12.7	3.0
73	Articles of Iron or Steel	4.4	44.6	9.8	2.3
22	Beverages, Spirits, and Vinegar	0.9	10.0	8.7	2.1
40	Rubber and Articles Thereof	3.5	43.8	7.9	1.9
90	Optic, Photographic, and Medical Instruments	3.6	47.0	7.7	1.8
29	Organic Chemicals	1.3	19.1	6.6	1.6
63	Textile Articles, Needlecraft, Worn Textile Articles	2.6	40.6	6.4	1.5
44	Wood and Wood Articles	1.6	26.2	6.2	1.5
42	Leather Articles, Saddlery, Handbags	3.8	63.7	5.9	1.4
03	Fish, Crustaceans	2.1	39.6	5.3	1.3
30	Pharmaceutical Products	0.1	2.8	4.7	1.1
48	Paper and Paperboard	1.4	32.5	4.5	1.1
	Total, Top 20 Containerized Imports	**157.7**	**46.8**	**337.1**	**79.6**
All Containerized Imports		**182.3**	**43.0**	**423.4**	**100.0**

Source: Congressional Budget Office based on information from the U.S. Maritime Administration.

Note: HS = Harmonized Commodity Description and Coding System.

Table 4.

Top 20 Containerized Exports, by Value, 2004

HS#	Category of Export	Los Angeles and Long Beach Ports: Value (Billions of dollars)	Los Angeles and Long Beach Ports: Percentage of Total Containerized Exports of That Commodity	All U.S. Ports: Value (Billions of dollars)	All U.S. Ports: Percentage of Total Containerized Exports Nationwide
84	Machinery, Boilers, Reactors, Parts	4.9	22.3	21.8	15.7
39	Plastics and Articles Thereof	3.5	27.6	12.5	9.0
87	Vehicles and Parts, Except Railway or Tramway	1.9	22.6	8.3	6.0
85	Electric Machinery, Sound and Television Equipment, Parts	2.3	30.1	7.6	5.5
29	Organic Chemicals	1.9	24.4	7.6	5.5
52	Cotton, Including Yarn and Fabric	1.9	41.1	4.7	3.3
38	Miscellaneous Chemical Products	1.0	23.1	4.4	3.2
48	Paper and Paperboard	0.4	10.1	3.8	2.7
90	Optic, Photographic, and Medical Instruments	0.9	24.8	3.7	2.7
28	Inorganic Chemicals	0.5	16.6	3.2	2.3
08	Edible Fruit and Nuts	0.7	27.2	2.7	1.9
40	Rubber and Articles Thereof	0.6	22.3	2.5	1.8
24	Tobacco and Tobacco Substitutes	0.4	14.4	2.5	1.8
47	Wood Pulp, Recovered Paper Waste and Scrap	0.4	15.6	2.3	1.7
33	Essential Oils, Perfumes, Cosmetics	0.6	24.8	2.3	1.6
02	Meat	0.2	9.9	2.1	1.5
44	Wood and Wood Articles	0.2	7.5	2.1	1.5
32	Tanning Extracts, Dyes, Paint, Ink, Etc.	0.4	21.7	2.0	1.4
41	Raw Hides, Skins, and Leather	0.7	40.1	1.8	1.3
72	Iron and Steel	0.5	26.4	1.8	1.3
	Total, Top 20 Containerized Exports	**23.7**	**23.8**	**99.6**	**71.5**
All Containerized Exports		**31.7**	**22.7**	**139.3**	**100.0**

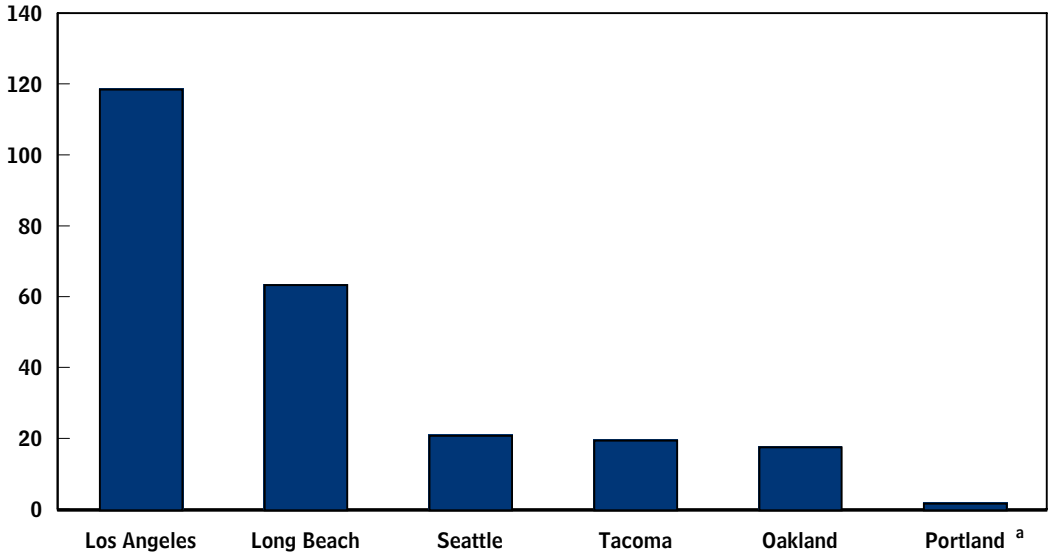
Source: Congressional Budget Office based on information from the U.S. Maritime Administration.

Note: HS = Harmonized Commodity Description and Coding System.

Figure 2.

Value of Containerized Imports at the Six Largest West Coast Ports, 2004

(Billions of dollars)



Source: Congressional Budget Office based on information from the U.S. Maritime Administration.

a. Less than $2 billion.

tion, container trade at those ports nearly doubled between 1994 and 2004, about the same as growth in containerized cargo overall.[4]

Imports into Los Angeles and Long Beach are predominantly finished goods rather than intermediate ones. The simulations discussed below suggest that almost two-thirds of the containerized goods received at those ports are likely to be finished goods.

Capacity Constraints

The constraints on container traffic are complex, depending on the capacity at several points in the supply chain. In general, containerized cargo in the United States moves from place to place through a network—called intermodal shipping—that links vessels, port terminals, and trucks and trains. To receive container ships, a port must have a deep enough channel to accommodate large vessels and enough berths where those ships can tie up. In addition, to manage the containers, a port must have:

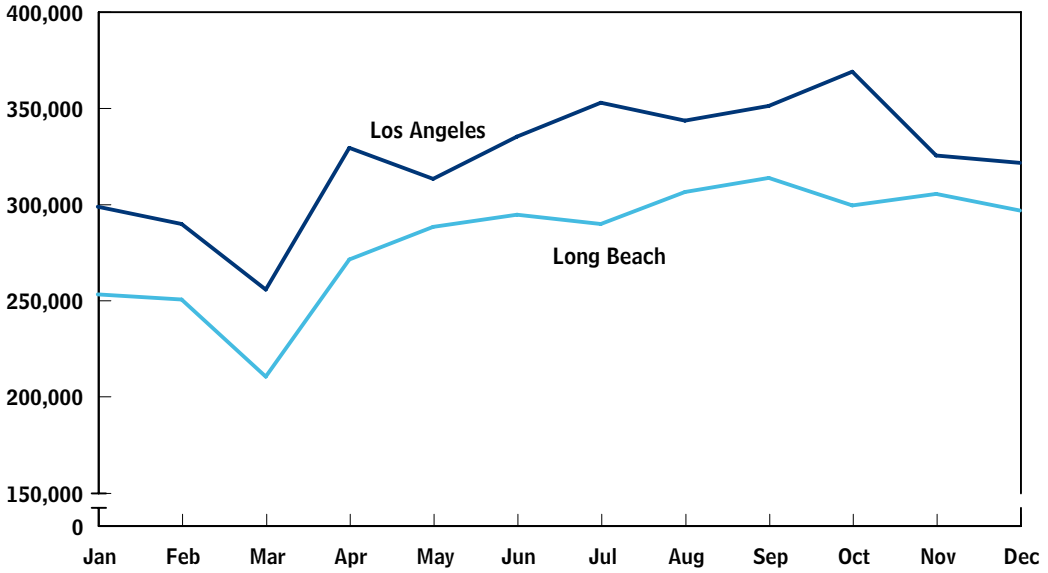
- Special equipment for loading and unloading containers to and from ships,

4. Department of Transportation, *Freight Facts and Figures 2005* (November 2005), Figure 2-8 (available at www.ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/05factsfigures/fig2_8.htm).

Figure 3.

Monthly Containerized Imports at Los Angeles and Long Beach Ports, 2005

(In 20-foot equivalent units)



Source: Congressional Budget Office based on information from the Port of Los Angeles and the Port of Long Beach.

Note: Marine containers come in various sizes. To allow for consistency in comparisons, those sizes are commonly presented in terms of a standard 20-foot container. For example, one 40-foot container would be counted as two 20-foot equivalent units.

- On-dock storage space and equipment for moving containers to local terminals (or to storage and distribution centers farther inland), and
- Intermodal connections for loading containers on trucks or rail cars.

Assuming that container ships can enter a port and that enough skilled labor exists to fully use cranes for loading and unloading, a key bottleneck on traffic often becomes dock space. As the stacks of containers on the dock grow, the process of sorting among them and of locating and moving individual containers to specific terminals or intermodal connections can quickly bog down. Moreover, when containers make it to the point of leaving the port, sufficient truck and rail capacity must be available to carry them away. Constraints on rail capacity, for example, contributed to a slowdown in the distribution of imports in late 2004.[5]

On the West Coast, options for diverting traffic from one port to another are limited by the existence of few natural harbors (mainly San Pedro Bay, San Francisco Bay, and

5. Congressional Budget Office, *Freight Rail Transportation: A Review of the 2004 Experience* (May 2005), pp. 5-7.

Puget Sound). In addition, shippers' ability to divert container traffic is likely to vary depending on the time of year. Seasonal peaks in traffic into Los Angeles and Long Beach, for example, occur in the late summer and fall; traffic is lighter in the winter and early spring (see Figure 3).

Two Disruption Scenarios and Estimates of Their Cost to the Economy

At the direction of the Subcommittee, CBO considered two alternative scenarios involving disruptions at U.S. ports:

- A brief unexpected disruption of container traffic at the ports of Los Angeles and Long Beach. CBO assumed that the initial blockage would last one week but that the backlog of shipments would require at least one month to clear through other West Coast ports, air deliveries, and a reopened Los Angeles and Long Beach.

- A lengthy unexpected disruption of container traffic at Los Angeles and Long Beach coupled with a brief precautionary halt to container traffic at all U.S. ports. CBO assumed that the lengthy disruption would entail the total closure of Los Angeles and Long Beach for three years, after which those ports would fully reopen for business. During the closure, a share of those ports' former traffic would be diverted to other ports. The brief disruption for all other U.S. ports was assumed to last only one week, but the backlog of shipments, combined with the diversion of some traffic from Southern California, would require at least three months to clear.

The economic cost of a port closure would depend on its duration and on how shippers, producers, and consumers adapted to the shutdown. For a brief disruption, the cost would depend greatly on how the backlog of ships waiting to enter ports was resolved. In 2002, when a labor dispute closed major West Coast ports for 11 days, almost all ships were able to land within the next month, so the net impact on annual trade was minimal.

A disruption lasting more than a few days would have higher daily costs, because the measures taken by shippers and producers would become less effective the longer that traffic was disrupted. Inventories would be depleted, and cost-effective options to shift cargo to air would be exhausted. As months went by, however, shippers, producers, and consumers would adapt in ways that would reduce the daily economic cost of a disruption. The capacity of alternative ports would be expanded. Supply chains would be reconfigured, though perhaps at a higher cost than before the disruption. Producers might turn to domestic sources of supply, and consumers might choose to purchase a different mix of goods. Those types of adjustments—and the resilience of the economy that they imply—have been evident in the past in response to both natural disasters and the terrorist attacks of September 11, 2001 (see Box 1).

Box 1.

The Economic Costs of Previous U.S. Disasters

The economic damage that resulted from previous disasters offers some insight into the harm that could occur from a disruption of port traffic. In the case of the September 11 terrorist attacks and recent hurricanes, widespread losses of life, property, and jobs and disruptions of transportation networks caused significant economic damage to specific areas as well as to individuals and businesses. Those disasters also harmed the U.S. economy, but the total economic impact was less than had initially been feared.

Analysis of past disasters suggests that they have not had a large sustained effect on the national economy. For example, an examination of some disasters in the 1990s (the Northridge earthquake and Hurricanes Andrew and Floyd) concluded that gross state product recovered fully within a single quarter.[1]

September 11 Terrorist Attacks

According to a report by the Federal Reserve Bank of New York, the terrorist attacks of September 11, 2001, cost New York City an estimated $33 billion to $36 billion. That total comprises $7.8 billion in lost earnings of deceased workers, $3.6 billion to $6.4 billion in reduced wage and salary income of other workers, and $21.6 billion in costs for property damage and cleanup of the site.[2]

Those losses caused productivity to decline for several months locally and consumer confidence to drop nationwide. Air travel and consumer spending also fell. According to *Blue Chip Economic Indicators*, the outlook for the growth of real (inflation-adjusted) gross domestic product (GDP) in 2002 dropped sharply: from 2.7 percent just before the attacks to 1.0 percent the following January.[3] Real GDP actually grew by 1.6 percent in 2002, exceeding that expectation.

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1. Edward E. Leamer and Christopher Thornberg, *The Economic Impact of the Terrorist Attack on the World Trade Center Will Be Minor* (Los Angeles: UCLA Anderson Forecast, September 13, 2001), p. 2.

2. Jason Bram, James Orr, and Carol Rapaport, "Measuring the Effects of the September 11 Attack on New York City," *Economic Policy Review*, Federal Reserve Bank of New York, vol. 8, no. 2 (November 2002).

3. Aspen Publishers, Inc., *Blue Chip Economic Indicators*, vol. 27, no. 1 (January 10, 2002) p. 3, and *Blue Chip Economic Indicators*, vol. 26, no. 9 (September 10, 2001), p. 2.

Box 1.

Continued

Hurricanes Katrina and Rita

Hurricanes Katrina and Rita had an immediate effect on the economic activity of the Gulf Coast region as well as on the nation. Besides costing lives and damaging property, the hurricanes reduced energy production, which immediately drove up energy prices nationwide. Initial estimates of the total loss of physical capital attributable to those storms ranged from $70 billion to $130 billion.[4]

The effects of Hurricanes Katrina and Rita may have slowed the growth of real GDP during the second half of 2005 by roughly 0.5 percentage points.[5] The Congressional Budget Office estimates that GDP growth is likely to be boosted by a similar amount in the first half of 2006 as energy production comes back online and efforts to rebuild local communities stimulate the economy.

GDP Versus Standard of Living

Gross domestic product is a measure of economic output, not standards of living. Disasters often produce little or no long-term change in GDP, although they may drastically reduce the standard of living of people affected by them. Increased economic activity after a disaster helps to restore previous living standards. Rebuilding boosts GDP but by itself may not leave people as well off as they were before the disaster.

4. Statement of Douglas Holtz-Eakin, Director, Congressional Budget Office, "Macroeconomic and Budgetary Effects of Hurricanes Katrina and Rita," before the House Committee on the Budget, October 6, 2005, p. 3.

5. Congressional Budget Office, *The Budget and Economic Outlook: Fiscal Years 2007 to 2016* (January 2006), Box 2-1.

The estimates provided in this report are for a disruption of container trade caused by a shutdown of U.S. ports. The economic cost would be much the same from a shutdown of one or more foreign ports if the closure affected comparable trade flows. In the case of trans-Pacific trade, however, businesses that ship goods from Asia to the United States have more alternatives available to them than do the recipients of those goods in the United States. Thus, comparable disruptions of ports in Asia would have smaller effects on the United States. (Appendix B discusses a disruption of container shipments from the port of Hong Kong and options to reroute trade in that region.)

CBO's analysis focuses on the impact of lost trade opportunities. As such, it does not estimate the cost of other losses that might occur at the same time, such as the value of lives that could be lost in a terrorist attack on a port, the cost of replacing lost capital and equipment, or the additional costs of security changes that might be made in response to an attack.

A One-Week Shutdown of the Ports of Los Angeles and Long Beach

Previous studies of port closures and a simulation of the Subcommittee's short-term scenario shed light on the economic cost of the loss of container trade that would result from a weeklong port shutdown. Although about $500 million worth of containerized imports flowed daily into the ports of Los Angeles and Long Beach in 2004, closure of those ports for one week could cost the U.S. economy somewhere in the range of $65 million to $150 million per day. The lower end of that range comes from an estimate of how much shippers are willing to pay to avoid delays and from an analysis by the economic forecasting firm DRI-WEFA (now Global Insight) of the cost of a hypothetical shutdown of all West Coast ports. The high end of the range comes from a simulation specified by CBO and estimated by Inforum using its LIFT (Long-Term Interindustry Forecasting Tool) model.

The LIFT Simulation. CBO contracted with Inforum, a nonprofit economic consulting group affiliated with the University of Maryland, to simulate the Subcommittee's scenarios using Inforum's LIFT model of the national economy and assumptions supplied by CBO about the disruptions. LIFT can examine the macroeconomic effects over time of industry-specific disruptions, such as a loss of imports or exports. The assumptions supplied by CBO specified reductions in U.S. imports of certain goods, consistent with the amounts that had been arriving at Los Angeles and Long Beach. Those amounts were net of assumed diversions of some containerized imports to other ports (including ones in Canada and Mexico) and to other modes of transportation (including some transshipment to bulk cargo and air freight). The LIFT model and the simulation assumptions are described in greater detail in Appendix A.

The results of the LIFT model simulation indicate that a one-week shutdown of container traffic through Los Angeles and Long Beach would have a small and temporary impact on the national economy. For an average week, it would reduce GDP by $150 million per day, at most. That reduction would be temporary; once the shutdown was resolved and the delayed imports arrived and were processed, GDP would return to where it would otherwise have been.

If businesses cut employment in line with their loss of output, job losses for the week could be quite large, because the port shutdown would affect low-wage industries with relatively high numbers of employees more than high-wage industries with fewer employees. However, in a brief shutdown, many businesses would probably continue to pay idled workers until conditions returned to normal.

Those estimates most likely overstate the actual reductions in production and employment because they do not account for the increase in imports that would occur in the month after the shutdown as the backlog was cleared. Moreover, the simulation assumes that businesses do not reduce their inventories to maintain production as much as they probably would for a shutdown that lasted only a week.

Estimates of the Economic Cost of the 2002 Port Closure. Major West Coast ports were closed by a labor dispute from September 29 to October 9, 2002. A number of studies have produced estimates (both prospectively and after the fact) of the economic costs of such a shutdown.

A DRI-WEFA study of a closure of West Coast ports provides the basis for an estimate of roughly $75 million per day in costs to the economy from a seven-day shutdown of container traffic through the ports of Los Angeles and Long Beach.[6] That study's approach to estimating the cost of a disruption is in many ways similar to that of the LIFT simulations. To evaluate the Subcommittee's scenario for a one-week disruption, CBO adjusted the DRI-WEFA estimate to account for growth in the volume and value of container traffic since 2002 and the characteristics of the scenario. The DRI-WEFA estimate was for a shutdown in July, an average month for container traffic (see Figure 3). The cost would be larger in an above-average (fall) month and lower in a below-average (winter) month. The scenario considered in this analysis envisions an unanticipated shutdown, but DRI-WEFA assumed that shippers would anticipate a closure and take actions to reduce its costs. For that reason, the adjusted DRI-WEFA estimate may understate the cost of the short-term disruption evaluated in this analysis.

Another study estimated a cost of $1.9 billion per day for a 10-day closure of West Coast ports in 2000. However, in CBO's view, that estimate overstates the likely cost of the 2002 shutdown because of the limited nature of the impact-study approach used to produce the estimate (see Box 2 for more details).

Estimates Based on Shippers' Willingness to Pay to Avoid Delays. A 2001 study analyzed U.S. import data on a product-by-product basis for the mode of transport that shippers used (sea or air), the required transit time for a product by sea (air transit time was assumed to be one day), and the extra expense required for air shipment versus slower ocean shipment.[7] On the basis of that analysis, the study estimated that each day saved in shipping was worth, to an importer, 0.8 percent of the value of the goods being shipped. The converse is that each day of delay resulting from a port closure would cost the importer 0.8 percent of the value of the goods being shipped.

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6. DRI-WEFA, *The National Economic Impact of a West Coast Port Shutdown* (prepared for the Department of Labor, Office of the Assistant Secretary for Policy, May 29, 2002).

7. David Hummels, *Time as a Trade Barrier* (working paper, Purdue University, July 2001), available at www.mgmt.purdue.edu/faculty/hummelsd/research/time3b.pdf.

Box 2.

Differences Between an Impact Study and an Interindustry Study

Impact studies, such as those performed to assess the impact of port shutdowns or slowdowns, tend to estimate much larger economic effects from a port closure than do studies that use an interindustry approach. As one critic of them notes, port impact studies "typically assume fixed technology, industrial structure, and demand," whereas interindustry studies do not.[1] In addition, impact studies may include losses in business revenues that do not reflect net losses to U.S. income or output.

A widely cited 2001 impact study concluded that a 10-day shutdown of West Coast ports would cost the economy $1.9 billion per day.[2] The ports and related transportation links would absorb about 4 percent of that total cost, and importers, exporters, and supporting industries would absorb the rest. However, the estimate of the economic impact to importers includes the amount they pay to foreign suppliers for those imports, which would be a loss to the foreign suppliers but not a net loss to U.S. businesses. The study assumes that the ratio of direct and indirect business revenues from containerized cargo activity at West Coast ports to direct and indirect wages and salaries from that activity is 8.2. In 2000, the ratio of gross domestic product (GDP)—a better measure of domestic activity than business revenues are—to wages and salaries was 2.0. Scaling the study's estimate of $1.9 billion per day down by 2.0/8.2 would reduce the economic impact of such a shutdown to $470 million per day.

Even that estimate assumes that the economy adjusts much less in response to an adverse supply shock than an interindustry model such as LIFT assumes. For example, consider the case of electric lighting and wiring equipment. Such equipment is an important input to construction, accounting for 1.6 percent of the value of new construction in 1998. The roughly $25 million of electric lighting and wiring equipment imported daily through the ports of Los Angeles and Long Beach accounts for about 10 percent of U.S. demand for those items. If technology, industrial structure, and demand were fixed—as in an impact study—the loss of those imports could have a severe impact on construction.

1. Peter V. Hall, "We'd Have to Sink Ships': Impact Studies and the 2002 West Coast Port Lockout," *Economic Development Quarterly*, vol. 18, no. 4 (November 2004), pp. 354-367.

2. Martin Associates, *An Assessment of the Impact of West Coast Container Operations and the Potential Impacts of an Interruption of Port Operations, 2000* (Lancaster, Pa.: Martin Associates, October 23, 2001), prepared for the Pacific Maritime Association.

Box 2.

Continued

According to the interindustry study conducted by the Congressional Budget Office, however, the economy would adjust to such a loss in several ways:

- A substantial portion of the imports normally entering the United States through the closed ports would simply enter the country elsewhere. Such diversions of traffic would reduce the decline in imports of electric lighting and wiring equipment in a one-week shutdown from about $25 million per day to $16 million.

- U.S. producers of such equipment would make up for some of the shortfall. Results from the LIFT model—in which producers respond to the higher prices that domestic goods would command with less competition from imports—suggest that manufacturers would increase production by $8 million per day (compared with what they would otherwise produce) in a one-week port shutdown.

- Sellers and users of electric lighting and wiring equipment could draw down domestic inventories of such items. That might make available another $2 million per day in a weeklong shutdown. (That estimate probably understates the ability of businesses to draw down inventories during a one-week closure.)

With those factors taken into account, the U.S. supply of lighting and wiring equipment would decline by just $6 million per day in a one-week port shutdown—much less than the $25 million normally imported through Los Angeles and Long Beach. Failing to account for those adjustment factors would increase losses to the construction industry by a factor of more than four.

Two other factors could trim that loss further. First, the percentage of imports diverted from the Los Angeles and Long Beach ports would most likely be greater for important intermediate inputs, as users made sure they could obtain those goods. Thus, imports of items whose absence would trigger a large loss of GDP would probably decline by smaller percentages than would imports of other items. Second, to the extent possible, users would make more efficient use of goods that were in short supply.

That number can be used to estimate the cost of a one-week closure of the Los Angeles and Long Beach ports. The value of containerized imports entering through those ports is estimated to total almost $210 billion in 2006. If the backlog of shipments from a closure took three additional weeks to clear, then four weeks of cargo would be delayed overall—the week of cargo during the shutdown and the three following weeks of cargo, which would be delayed by the need for the ports to take care of the backlog. The average delay at the beginning of the three-week clearing period (including cargo that would have arrived on the first day of the disruption) would be seven days, and the average delay at the end would be zero. Therefore, the average number of days of delay for the four weeks of cargo would be 3.5 days. Hence, the total cost of the delay would be about $450 million for an average week, or $65 million per day of closure.

A Three-Year Shutdown of Container Traffic at the Los Angeles and Long Beach Ports

If the ports of Los Angeles and Long Beach were closed for three years, losses of both GDP and imports would be much larger—and would not be recouped after the shutdown. The pattern of losses would vary over time. The market for port services would be tightest during the first year of the disruption. Before shippers and their customers had time to fully adjust to the closure, the reliance on available ports (and the willingness to pay for port services) would be great. Extraordinary adjustments and large cost increases would occur. Imported goods with the lowest value would be likely to stay behind, requiring the greatest response from U.S. producers of substitute goods. Some of the highest-value items would be redirected through East and Gulf Coast ports and to air transport, raising shipping times and costs. All of those adjustments would be costly, so consumers and businesses would have to pay more for imports and for goods produced using imports.

Those cost increases would spur another set of adjustments, as consumers and businesses shifted their demand (to some extent) away from goods whose prices had risen the most and toward goods whose price increases had been more moderate. Consumers would curtail their overall purchases because rising prices would reduce their real income. Companies that relied on imports would look for domestic substitutes, whose production would then increase. Moreover, businesses would alter their investment plans to reflect both the change in demand for their products and the higher cost of their inputs.

With time, the new investments in facilities and intermodal connections with trucking and rail at alternative ports, plus the full reopening of the Los Angeles and Long Beach ports, would allow more imports to enter the United States at lower costs. GDP would almost completely rebound to where it would have been without the port disruption, and national employment would rebound completely. Activity levels at various ports could be somewhat different, however, as could business practices. The Los Angeles and Long Beach ports could permanently lose some business to other

ports that had added capacity. Businesses might decide to carry more inventory to guard against future disruptions in imports.

Diversion Assumptions in the Simulation. To represent shippers' and customers' response to the closure of a port and the likely increases in containerized imports at other ports, CBO assumed that only part of the growing container traffic that normally would have been flowing to Los Angeles and Long Beach (baseline imports) would not enter the United States. Specifically, CBO assumed that:

- In the first year, 35 percent of the baseline imports would arrive elsewhere in the country;
- By the second year, construction of additional port and air-freight capacity would boost that figure to 55 percent; and
- By the third year, 70 percent of that baseline traffic would enter the United States.

Those assumptions are consistent with how much additional traffic the nation's remaining ports might be able to handle, given the likely additions to their capacity and other adjustments. Among the changes that would help to limit import losses, CBO assumed that 5 percent of baseline containerized imports would be diverted, in some combination, to ports in Canada and Mexico (for subsequent import by rail and truck) or would travel instead as bulk cargo or air freight. Even so, the nation's other container ports would have to increase their total intake of containers by about 25 percent over baseline levels in the first year, by 35 percent by the second year, and by 50 percent by the third year. In the first year of the scenario, the one-week national disruption combined with the lengthy closure of Los Angeles and Long Beach would mean that other U.S. ports would need at least three months to clear the backlog from that one week. The backlog also contributes to the especially large loss of imports in that first year.

Exports would also be disrupted by a closure of the Los Angeles and Long Beach ports, although the principal economic effects would result from the disruption of imports. Containerized exports at those two ports are so small ($32 billion in 2004) relative to containerized imports ($182 billion) that constraints on the capacity to move them to other ports and load them on ships are unlikely to be a problem. Thus, CBO assumes that all of those exports could be diverted to other ports.

The cost of transporting those export goods to alternative ports would most likely be greater than the cost of shipping them to Los Angeles and Long Beach. The cost increase would be small, however, because many of the affected commodities are already being transported to the West Coast from other parts of the country.

Simulation Results. In the simulation, the three-year shutdown reduces real GDP by between 0.35 percent and 0.55 percent, or $45 billion to $70 billion, per year. That

translates into daily costs ranging from $125 million to $200 million. Outlays by consumers and businesses fall by substantially more than that, however, because they include less spending on both imported and domestically produced goods, whereas the decline in real GDP reflects only reductions in domestic production.

Inflation—as measured by consumer prices—is about 2 percentage points higher in the first year of the simulation than it would be otherwise, little changed in the second year, and lower thereafter, eventually bringing the level of consumer prices back to where it would have been without the disruption. (Thus, for example, if inflation would have been a steady 2 percent without the port closure, it would rise to 4 percent in the first year of the shutdown, fall back to 2 percent in the second year, and then decline further in the following two years.) Initially, the increase is driven by the constraint on imports. The LIFT model assumes that the effects of that constraint are reflected only slowly in final prices; thus, it may understate the impact on inflation in the first year. However, the slow response of final prices is consistent with recent experience, when core consumer prices did not change significantly in response to the shock of higher energy prices. Inflation declines in the third and fourth years of the simulation (despite the delayed impact of the first year's import shortage) mainly because of the adjustments that are assumed to be made—especially the easing of the shortage through increases in imports at other ports.

An additional 2 percent jump in prices would call for a decision by the Federal Reserve Board about whether to tighten monetary policy to constrain inflation. The usual rules of thumb for monetary policy suggest that interest rates would rise. However, in the simulation, interest rates actually fall slightly in nominal terms, which implies a large reduction in real interest rates and an extremely accommodative monetary policy. Because the increase in inflation would be expected to be temporary, the Federal Reserve might well decide that an accommodative policy was appropriate to minimize losses to GDP and income. If, instead, the Federal Reserve acted more aggressively to suppress the additional inflation, the first-year increase might not be affected much (because of inflation's slow response to monetary policy), but the decline over the next two years would be greater. However, the reduction in real GDP during the three-year shutdown would probably also be larger.

The employment level would be about 1 million jobs lower, on average, over the three-year period than it would be otherwise, according to the simulation. That reduction is large given the reduction in GDP because the jobs that would be lost on account of the closure have, on average, lower pay and productivity and fewer weekly hours than the national averages. However, given uncertainty about the composition of the displaced imports and the response of individual industries to such a disruption, the decline in employment is highly uncertain. In any event, that decline—which equals roughly six months' worth of employment growth—would not be permanent. Employment would rebound as the economy recovered from the disruption.

A loss in GDP would persist after the three-year shutdown, the simulation indicates, though at a much lower level (less than 0.1 percent of GDP in the succeeding two years). That result occurs in part because the decline in investment in the first three years is not fully made up, leaving the economy with a slightly smaller productive capacity.

Sources of Uncertainty. Those simulation results are subject to a great deal of uncertainty, which stems from various sources:

- The ability of importers to find alternative ways to bring products into the United States—through other ports, by air, or even via Canada and Mexico—is unclear. A fuller understanding of the potential for diverting traffic would require a port-by-port analysis of the present spare capacity (including the capacity of intermodal links and of rail and trucking), current plans for expanding capacity, and likely growth in container traffic.

- CBO has no specific knowledge about which industries or companies use just-in-time inventory management and thus could be disproportionately upset by disruptions to imports. Ignoring just-in-time inventory management might, by itself, lead to understating the effects of import disruption. However, CBO has also made no specific assumptions about the ability of importers with high-value goods—such as those destined for just-in-time manufacturers—to get to the head of the line. If high-value imports are less affected and the imports that cannot enter through alternative ports are largely of low value, the simulations may overstate the costs of a port closure. (For the unit values of major imports to Los Angeles and Long Beach, see Table 5.)

- The outcome for GDP will depend in part on the speed with which increases in import prices are reflected in the prices of final goods and on the Federal Reserve's response, both of which are uncertain.

Table 5.

Unit Value of the Top 20 Containerized Imports at Los Angeles and Long Beach Ports, 2004

HS#	Category of Import	Value (Billions of dollars)	Weight (Thousands of short tons)	Unit Value (Thousands of dollars per ton)
84	Machinery, Boilers, Reactors, Parts	38.0	698.6	54.3
85	Electric Machinery, Sound and Television Equipment, Parts	31.7	677.0	46.8
87	Vehicles and Parts, Except Railway or Tramway	12.1	337.4	35.8
62	Apparel Articles and Accessories, Not Knit or Crochet	9.9	132.4	74.6
95	Toys, Games, and Sports Equipment and Parts	9.4	377.1	25.0
94	Furniture, Bedding, Lamps, Etc.	9.3	739.8	12.6
61	Apparel Articles and Accessories, Knit or Crochet	9.0	132.1	68.4
64	Footwear	7.8	181.4	43.0
39	Plastics and Articles Thereof	5.2	409.0	12.8
73	Articles of Iron or Steel	4.4	467.0	9.4
42	Leather Articles, Saddlery, Handbags	3.8	117.2	32.1
90	Optic, Photographic, and Medical Instruments	3.6	41.8	86.2
40	Rubber and Articles Thereof	3.5	207.1	16.7
63	Textile Articles, Needlecraft, Worn Textile Articles	2.6	97.9	26.3
03	Fish, Crustaceans	2.1	86.0	24.5
44	Wood and Wood Articles	1.6	210.0	7.8
83	Miscellaneous Articles of Base Metal	1.6	91.6	17.5
82	Tools, Cutlery, Etc.	1.6	61.4	25.3
48	Paper and Paperboard	1.4	162.7	8.9
72	Iron and Steel	1.3	461.6	2.8
	Total, Top 20 Containerized Imports	**159.9**	**5,689.1**	**n.a.**
All Containerized Imports		**182.3**	**7,465.2**	**n.a.**

Source: Congressional Budget Office based on information from the U.S. Maritime Administration.

Note: HS = Harmonized Commodity Description and Coding System; n.a. = not applicable.

Appendix A: How CBO Estimated the Macroeconomic Effects of a Port Shutdown

To estimate the impact of a disruption to containerized traffic, the Congressional Budget Office (CBO) contracted with Inforum, a nonprofit economic consulting group affiliated with the University of Maryland, to use its LIFT model. LIFT is an interindustry model with full "bottom-up" (commodity-by-commodity) accounting that can be used to examine the macroeconomic effects of industry-specific disruptions to imports. In the model, disruptions to imports of intermediate goods—modeled as increases in the prices of those goods—result in lost domestic production of items that use the goods as inputs. Domestic competitors of foreign suppliers increase production, offsetting some of the reduction in gross domestic product (GDP). Disruptions to imports of final goods result in lower consumption and investment but little net change in GDP.

To estimate the types and values of trade that would be affected by a disruption, CBO's analysis uses 2004 data from the federal government on imports arriving at individual ports by container and arriving nationwide by all modes of transportation—air freight, tankers, containers, bulk cargo, and rail.[1] Imported commodities are categorized according to the Harmonized Commodity Description and Coding System (HS). The data on individual port traffic are available at the 6-digit HS level of detail. Additional data on national imports arriving by all modes are available at the 10-digit HS level. Inforum converts those HS data to Standard Industrial Classification (SIC) codes for interface with the LIFT model.

CBO's analysis of the port-closure scenarios is built on the assumption that imports of specific commodities would decline by the amounts that would have been expected to arrive in Los Angeles and Long Beach. The reductions are net of imports assumed to be diverted to other ports (including some in Canada and Mexico) or arriving by other modes of transportation (including some transshipment to bulk cargo and air freight).[2] One key factor in deciding how much traffic could be diverted to unaffected ports is the reasonableness of the resulting increase in traffic at those ports.

1. Data on trade in goods, by commodity, were provided to CBO by the Foreign Trade Division of the Census Bureau and by the U.S. Maritime Administration.

2. CBO assumed that net containerized imports at U.S. ports (including Los Angeles and Long Beach) would have grown by 7.5 percent annually in 2006 through 2008 in the absence of a shutdown.

In a three-year shutdown, the amount of diversion is assumed to grow each year, consistent with the construction of new capacity at other ports and greater use of alternative modes of transportation. Specifically, CBO assumed that:

- In the first year, 35 percent of the baseline container shipments to the Los Angeles and Long Beach ports would arrive elsewhere in the United States;

- By the second year, that figure would rise to 55 percent with the construction of additional port and air-freight capacity; and

- By the third year, 70 percent of that baseline traffic would enter the country.

To implement the import reductions in the simulations, Inforum raised import prices to the level required to reduce imports of a commodity by the amount assumed in the disruption scenario. That level may not be the price paid by importers, because nonprice rationing, or shortages, might occur during the disruption. Rather, those higher prices represent the "shadow price" of imports—the true cost of imports to their users. Higher shadow prices encourage U.S. consumers and businesses to substitute other goods for scarce imports and encourage U.S. producers to boost output of those items.

Since the shadow price can differ substantially from the actual price received by foreign suppliers, the rise in import prices overstates the total amount that U.S. customers pay to foreign suppliers in the simulations. CBO assumed that only 25 percent of the rise in import prices represents a genuine increase in those prices. The rest is recycled back to the United States through an increase in U.S. income from foreign assets. (Part of the rise in shadow prices can be thought of as an increase in the income of foreign subsidiaries of U.S. firms.)

Appendix B: Disruption of Container Shipments from Hong Kong

Although this report focuses on the consequences of disruptions to U.S. port activity, events that forced the closure of major foreign ports would also be of concern to the United States. The impact on U.S. consumption or production would depend on the value of the goods that were not delivered to the United States, regardless of where the supply chain was interrupted.

Some people have expressed specific concern about the effects of a closure of Hong Kong, the largest container port in the world (see Figure B-1). However, the opportunities to divert traffic around Hong Kong appear to be substantial, which would diminish the impact of a shutdown of that port.

Hong Kong (including the cities of Hong Kong and Kowloon) is the biggest single source of container shipments to the United States. In 2004, $43.4 billion in containerized imports arrived in the United States from Hong Kong. They accounted for about 10 percent of all containerized imports to the United States and about 3 percent of total U.S. imports of goods.

Those figures overstate the importance of Hong Kong as a source of U.S. imports, however. Hong Kong is a major location for transshipment—nearly 90 percent of the containerized goods leaving that port originated elsewhere (see Table B-1). Containerized goods and bulk cargoes arrive in Hong Kong from other ports in Asia, generally on relatively small vessels, and by land from elsewhere in China. Those shipments are consolidated and loaded onto very large container ships for the journey to North America and elsewhere.

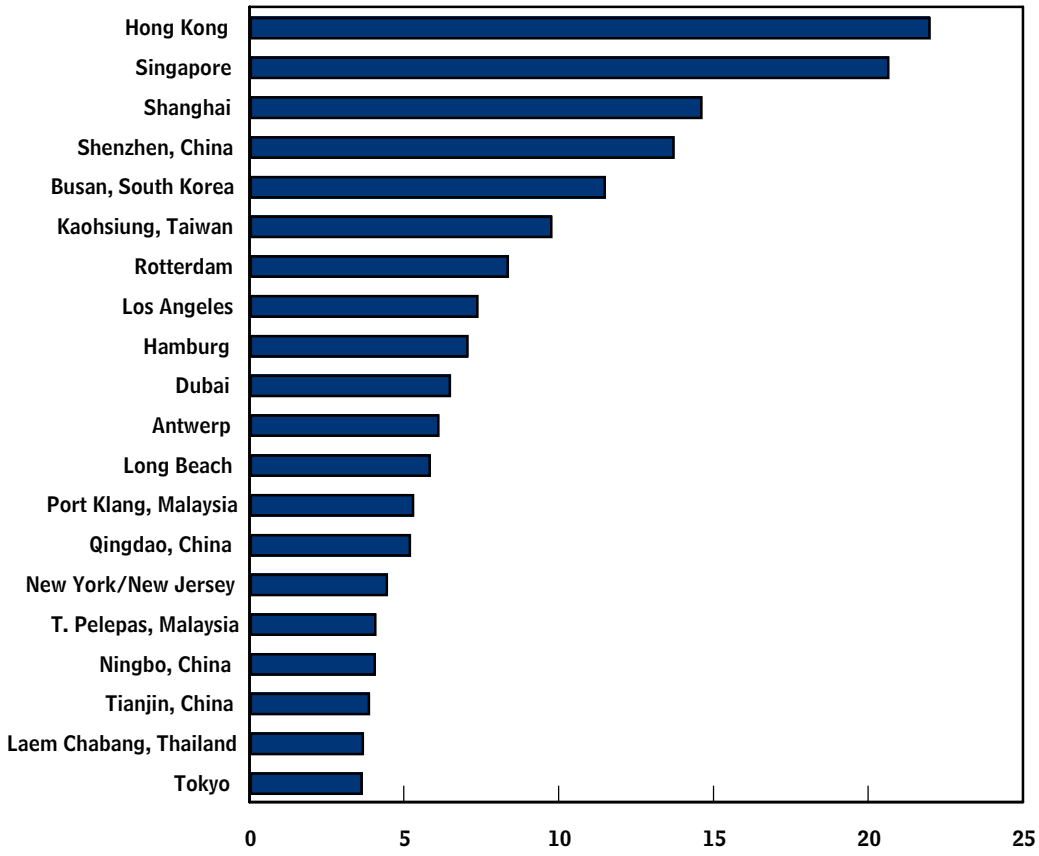
Any closure of Hong Kong would probably force other ports in the region to take on more of the task of consolidating shipments. In addition, many container shipments to the United States and other destinations would most likely forgo transshipment altogether, traveling on smaller vessels than would otherwise be the case.

Thirteen of the world's top 20 ports for container shipments are located in Asia; thus, the opportunities for other regional ports to compensate for a closure of Hong Kong are significant. Moreover, those ports are already competing aggressively with Hong Kong for additional business. All of them have rapidly expanded the capacity to handle containers in recent years. Judging by 2005 traffic levels, if all Hong Kong container traffic was diverted to the closest top-20 ports (in Singapore, China, South Korea, Taiwan, and Japan), shipments from those ports would increase by 25 percent.

Figure B-1.

Containerized Imports and Exports from the World's 20 Largest Ports, 2004

(Millions of 20-foot equivalent units)



Source: Congressional Budget Office using data from Bloomberg.com, "Hong Kong Trails Singapore in 2005 Container Volume" (January 16, 2006), available at www.bloomberg.com/apps/news?pid=10000080&refer=asia&sid=aPIM0vYUVhbQ#.

Note: Marine containers come in various sizes. To allow for consistency in comparisons, those sizes are commonly presented in terms of a standard 20-foot container. For example, one 40-foot container would be counted as two 20-foot equivalent units.

For those reasons, a closure of Hong Kong could raise the cost of shipping goods to the United States, but it would be unlikely to curtail shipments significantly. The cost increase would be lower if additional diversion occurred to smaller ports in Asia. If an increased percentage of available container space was used for goods with the highest value—as would be likely—the economic impact on the United States would be lower still.

Table B-1.

Top 20 Containerized Imports to the United States, by Value, That Passed Through or Originated in Hong Kong, 2004

(Billions of dollars)

HS#	Category of Import	Total Containerized Imports from Hong Kong	Total Originating in Hong Kong	Total Transshiped from Hong Kong	Percentage Transshiped
85	Electric Machinery, Sound and Television Equipment, Parts	8.5	0.7	7.9	92.3
95	Toys, Games, and Sports Equipment and Parts	6.3	0.2	6.1	96.9
84	Machinery, Boilers, Reactors, Parts	3.9	0.2	3.7	94.7
61	Apparel Articles and Accessories, Knit or Crochet	3.9	1.3	2.6	65.8
64	Footwear	3.8	0.1	3.7	97.9
62	Apparel Articles and Accessories, Not Knit or Crochet	3.4	1.4	2.0	57.8
94	Furniture, Bedding, Lamps, Etc.	2.2	0.1	2.1	93.8
42	Leather Articles, Saddlery, Handbags	2.1	0.1	2.0	95.1
39	Plastics and Articles Thereof	1.4	0.2	1.2	86.6
49	Printed Books, Newspapers, Etc.	0.8	0.2	0.6	73.0
90	Optic, Photographic, and Medical Instruments	0.7	*	0.7	93.3
73	Articles of Iron or Steel	0.5	0.1	0.5	89.7
67	Prepared Feathers, Down, Etc.	0.5	*	0.5	96.7
83	Miscellaneous Articles of Base Metal	0.5	*	0.5	91.5
48	Paper and Paperboard	0.5	0.1	0.4	88.3
91	Clocks and Watches and Parts	0.4	*	0.4	95.1
63	Textile Articles, Needlecraft, Worn Textile Articles	0.4	*	0.4	93.1
96	Miscellaneous Manufactured Articles	0.3	*	0.3	89.1
87	Vehicles and Parts, Except Railway or Tramway	0.3	*	0.3	86.4
82	Tools, Cutlery, Etc.	0.3	*	0.2	92.7
	Total, Top 20 Containerized Imports	**40.8**	**4.9**	**35.9**	**88.0**
All Containerized Imports		**43.4**	**5.3**	**38.1**	**87.8**

Source: Congressional Budget Office based on data from the U.S. Maritime Administration.

Note: HS = Harmonized Commodity Description and Coding System; * = less than $50 million.