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Assessment of the Impact of Panama Canal Transit Cost Changes on the Peruvian Economy

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Executive Summary

In 2004, the Autoridad del Canal de Panama (ACP) performed a detailed analysis to determine the impact of Canal transit cost increases on the Canal's customers. This research indicated that an increase in Canal transit costs would not have significant adverse effects on traffic, although the impact would vary by Canal customer segment. Given the mix of commodities that transit the Canal and the political and economic importance of the countries of origin, the ACP determined that it was important to explicitly assess and understand the impact of different pricing options on the economies of stakeholder countries.

This report provides a high-level overview of Peruvian trade in relation to the Panama Canal and a detailed analysis of the impact of potential new Canal pricing options on the export and import commodities transiting the Canal that are most important to Peru's economy, representing approximately 80 percent of total volume that trades through the Canal to and from Peru. For each commodity, the analysis examines the relevance of Canal-based traffic to Peru's overall imports and exports and the impact of transit cost increases on overall landed costs and Peru's economy.

Peruvian Waterborne Trade

During 2001-2003, the Peruvian economy was one of the fastest growing in South America, with an average growth rate of 4.8 percent. The Peruvian economy is not highly dependent on international trade, given that its total trade accounts for less than 30 percent of GDP. Exports have been growing nearly twice as fast as imports over the past 10 years.

Approximately 95 percent of Peru's international trade by weight and 71 percent of trade by value move by sea. Between 2000 and 2002, Peru was a net exporter with respect to sea trade, with exports accounting for 53 percent of total waterborne goods trade.

Peru's major trade partners are Asia, Europe, and South America, which accounted for 89 percent of Peru's exports by value in 2002. Asia (China and Japan) is the most important market for Peruvian exports, followed by Europe. On the import side, Asia and South America are Peru's largest import partners.

Peru's exports are primarily composed of raw materials and natural resources, particularly mineral and metal ores, petroleum products, and fishmeal. Mineral ores make up 53 percent of export tons. On the import side, approximately 75 percent of Peru's total sea import tons are raw materials and capital goods for Peru's industrial sector. Oil products and grain account for more than half of total import tonnage.

Peruvian Trade Through the Panama Canal

Peru's major Canal-relevant trade lanes are to/from the East Coast US, Europe, and the East Coasts of South and Central America. East Coast US and Europe account for more than two-thirds of export tons, while East Coast South America and East Coast US account for two-thirds of import tons.

Panama Canal-relevant Peruvian exports were 35 percent of Peru's total sea exports in 2003, while Canal-relevant imports were 40 percent of total sea imports. Container cargo, zinc, iron and copper ores, and salt make up half of Canal-relevant export volumes, while container cargo, crude oil, wheat, and diesel oil make up half of import volumes.

Methodology for Canal-Relevant Commodity Analysis

For the purposes of this study, the ACP analyzed Peruvian export commodities and import commodities, representing 80 percent of Peru's trade volume through the Canal.

As mentioned previously, these commodities were analyzed with the objective of determining the potential impact of an increase in Canal transit costs on landed cost, and therefore the relevance of transit cost increases to Peruvian trade and Peru's economy.

The methodology for analysis of export commodities was threefold:

1. The relevance of Panama Canal tonnage transits for 1999-2003 to the overall trade in the commodity for Peru was determined.

2. If the commodity tonnage transits through the Canal were above a certain threshold (percent of country trade) then the commodity was analyzed further to determine the relevance of a potential increase in Canal transit cost on landed cost. The components

of total landed cost include FOB, Canal transit cost (toll plus other marine services), other freight costs, and insurance.

3. A sensitivity analysis was then applied to determine a range of impacts on landed cost given different Canal transit cost increase scenarios.

For imports, the ACP undertook a more general analysis of the impact of Canal transit cost increases, focused on the final landed cost of each commodity and the impact of the aggregated value of Canal-relevant imports on total Peruvian imports and GDP.

Export Commodities Analysis

Overall, Panama Canal-relevant exports, including all containerized cargo, make up 27 percent of total Peru merchandise exports. As shown in Exhibit 1-1, the export commodities analyzed for this study represented approximately 53 percent of Peru's total merchandise exports in 2003; approximately 33 percent of this value transited the Panama Canal.

Of the 17 commodities analyzed in this report, Canal exported quantities account for different shares of each commodity's total exports. In some cases, like salt, zinc metal, coffee, and fish, more than 50 percent of Peru's exports of this commodity transit the Panama Canal. In other cases, only 20-50 percent of a commodity's exports are transported through the Panama Canal, including bulk copper metal, copper ore, gasoline, fishmeal, fish oil, zinc ore, wood, and vegetable preparations.

Some of the analyzed export commodities also represent an important portion of total Peruvian exports. In 2003, copper (refined copper and copper ore) exports accounted for 15 percent of Peru's total exports, fishmeal exports accounted for 8.5 percent, zinc (refined zinc and zinc ore) accounted for 7 percent, and vegetables accounted for 4.3 percent. The other analyzed commodities represent less than 4 percent of total exports each.

Exhibit 1-1

Canal-Relevant Peruvian Exports Analyzed

Commodity	1. FOB Value of Canal Exports (US$M)	2. Canal Share of Total Exports	3. Total Export Value (US$M)	4. Commodity Exports Share of Peru's Exports	5. Canal Transit Cost Share of CIF	6. 200% Toll Increase Impact on CIF
Bulk						
Copper metal	$1,727.62	34.5%	$913.9	10.4%	0.1%	0.22%
Copper ore	$403,27	34.2%	$421.9	4.8%	0.5%	0.76%
Crude petroleum	$170.30	16.3%	$266.2	3.0%	1.0%	1.57%
Gasoline	$224.38	47.2%	$76.4	0.9%	1.2%	1.84%
Residual fuel oil	$178.75	15.5%	$324.7	3.7%	1.2%	1.89%
Fishmeal	$541.00	21.2%	$742.0	8.5%	0.5%	0.73%
Fish oil	$432.57	37.0%	$80.1	0.9%	0.5%	0.69%
Iron ore	$18.50	11.8%	$94.05	1.1%	8.0%	12.75%
Salt	$8.40	100%	$3.3	0.04%	8.3%	12.93%
Zinc metal	$840.25	98.7%	$163.1	1.9%	0.3%	0.38%
Zinc ore	$216.77	33.9%	$430.1	4.9%	1.0%	1.44%
Container						
Vegetables	$564.41	9.1%	$374.7	4.3%	0.5%	0.74%
Coffee	$1,160.04	80.4%	$181.05	2.1%	0.3%	0.44%
Fruit	$787.57	15.4%	$111.2	1.3%	0.4%	0.58%
Fish and crustaceans	$2,205.54	57.6%	$240.0	2.7%	0.2%	0.37%
Wood	$1,306.79	26.0%	$97.3	1.1%	0.4%	0.62%
Copper metal	$1,971.42	15.3%	$913.9	10.4%	0.3%	0.43%
Vegetable prep.	$963.55	41.7%	$135.8	1.6%	0.3%	0.52%

Description of columns:

1 The merchandise FOB value of the Canal-relevant portion of exports for each commodity
2 The percent of the total FOB export value for each commodity that transited the Canal
3 The total FOB value of all Peruvian exports of each commodity, regardless of transportation mode or route
4 The percent of total Peruvian exports FOB value accounted for by each commodity
5 The percent of the final landed cost (CIF) of each commodity accounted for by the total Canal transit costs (toll, other marine services) of that commodity
6 The percent change in the CIF as a result of a 200 percent increase in the Panama Canal toll for ships carrying this commodity

With the exception of salt and iron ore, Canal cost is not a significant portion of the analyzed commodities' CIF. Salt, iron ore, and certain other commodities that are important to the Peruvian economy (copper, zinc, and fishmeal) were further analyzed to understand the potential effects of an increase in Canal tolls on demand.

- ***Copper:*** Copper exports transiting the Canal are about 6.8 percent of total exports. This is a high value commodity and thus the Canal cost is a small portion of the total CIF cost; a maximum increase in Canal tolls of 200 percent would impact refined

copper CIF by only 0.22 percent and copper ore CIF by 0.76 percent. Additionally, market dynamics, i.e., increasing European and Asian demand for copper and stable US demand, indicate that the market is not sensitive to small price increases, and that the larger challenge for Peru will be delivering sufficient copper to meet demand.

- ***Zinc:*** Peru is the dominant producer of exported zinc, with few alternative sources of supply**.** Canal transit cost represents only 0.38 percent of zinc metal and 1.44 of zinc ore CIF, thus an increase in the Canal toll would not materially affect landed cost or the competitive landscape. Additionally, zinc represents only 6.7 percent of Peru's total exports, and thus the impact of a Canal toll increase would not have a significant effect on Peru's economy.

- ***Fishmeal:*** Peru is the world's dominant producer and exporter of fishmeal. Canal cost represents only 0.73 percent of fishmeal's CIF, thus an increase in the Canal toll would not materially affect landed cost or the competitive landscape. Furthermore, Peruvian fishmeal exports transiting the Panama Canal represent only 1.8 percent of Peru's exports, and thus the impact of a Canal toll increase would not have a significant effect on Peru's economy.

- ***Iron ore:*** Even though a 200 percent increase in Canal tolls would highly impact the CIF price of iron ore, only a small percentage of iron ore exports transit the Canal (12 percent), representing 0.1 percent of total Peruvian exports, and thus the impact of a Canal toll increase would not have a significant effect on Peru's economy.

- ***Salt:*** All Peruvian salt exports transit the Canal, bound for the East Coast US. The landed cost of salt is highly sensitive to Canal toll increases: A 200 percent increase in tolls would affect the CIF price of salt by 12.93 percent or US$3.1 per ton. Further analysis determined that it would likely take an increase in CIF price of US$8 (the difference between the CIF of imported salt and salt at the mine mouth) however to shift imports. Additionally, salt represents only 0.04 percent of total exports, so a toll increase would not material affect the Peruvian economy.

Import Commodities Analysis

In 2003, Peru's Canal-relevant imports accounted for 14 percent of its total merchandise imports (valued in CIF terms) (Exhibit 1-2). Additionally, Peru's imports transiting the Panama Canal represented only 2 percent of Peru's GDP in 2003.

In 2003, Peru's current account deficit was US$1 billion, or 1.7 percent of GDP. The analysis determined that an increase in import prices, due to an increase in Canal tolls, would have a minimal impact on Peru's deficit and national income: Even if tolls were increased by 200 percent for all Peruvian imports that transit the Canal, the cost of total goods imports would grow by only 1.2 percent, the current account would remain at 1.7 percent of GDP, and national income would drop by about 0.02 percent, with an negligible impact on inflation.

Exhibit 1-2
Canal-Relevant Peruvian Imports Analyzed

Commodity	Canal Share	Canal Transit Tons 2003 (thousands)	Average CIF/Ton	CIF Value of Canal Transit Tons (US$M)
Crude petroleum	11%	634.10	$ 201	$ 127.31
Wheat	11%	969.96	$ 162	$ 157.18
Diesel oil & gasoline	10%	523.68	$ 286	$ 149.96
Fertilizers, misc.	8%	424,.44	$ 175	$ 74.18
Coal	7%	355.28	$ 44	$ 15.76
Corn	5%	82.86	$ 131	$ 10.83
Iron and steel	5%	259.24	$ 583	$ 151.11
Soybeans	2%	5.51	$ 252	$ 1.39
Liquefied gas	2%	202.06	$ 368	$ 74.28
Container cargo	4%	207.33	$ 2,181	$ 452.17
Other	36%	2,097.33		
Total CIF Value of Panama Canal Transit Tons (US$M)				**$ 1,214.15**

Source: Mercer analysis, UN COMTRADE , ACP database and US Waterborne 2003.

Conclusions

The analyses above demonstrate that given either the small proportion of a particular import/export commodity that transits the Canal, or the relatively small percentage of the landed cost represented by the Canal cost, the effect of a Panama Canal transit cost increase would not have a significant impact on Peru's economy, nor on the principal industries that provide Canal-relevant export commodities.

Finally, the larger question facing Peru's economy with regard to the Canal is less whether the transit cost changes examined would have a significant impact, but rather whether the Canal will have sufficient capacity available to meet demand in the future, while providing an adequate level service. The implications for the critical supply chains that serve Peru's economy of a deterioration in service – due to increased wait times or decreased reliability, for example – in the event that capacity is insufficient to meet demand, would be substantially more important than the analyzed Canal transit cost increases. Hence, the need to add capacity to the Canal – recognizing that the capital expense will have to be paid for through tolls – is the more critical issue facing Peru's economy, rather than the essentially negligible impact of the transit cost increases examined in this study.

2

Introduction

2.1 Study Context

The Panama Canal is a critical and unique element of the global marine transportation industry. Its construction almost a century ago remains a well-known triumph of vision, engineering, and determination. Its efficient, safe handling of more than 13,000 transits per year has made the Canal an important element of the global transport network. Growing trade volumes, however, and the increasing reliance by shipping companies on vessels larger than can physically pass through the Canal's locks (post-Panamax vessels) have raised questions about what the Canal's future investments and pricing policies should be, including whether or when a third set of locks should be built.

In 2004, the Autoridad del Canal de Panama (ACP) performed a detailed analysis to determine the impact of toll price increases on the Canal's customers. This research indicated that an increase in Canal transit tolls would not have significant adverse effects on traffic, although the impact would vary by Canal customer segment. Given the mix of commodities that transit the Canal and the political and economic importance of the countries of origin, the ACP determined that it was important to explicitly assess and understand the impact of different pricing options on the economies of stakeholder countries.

This report provides a high-level overview of Peru's trade in relation to the Panama Canal and a detailed analysis of the impact of potential new Canal pricing options on the export and import commodities transiting the Canal that are most important to the Peruvian economy.

The overall objectives of this study were as follows:

- Generate a clear understanding of Peruvian maritime trade

- Review historical Canal transit data to determine principal imported and exported commodities for Peru
- Determine the relevance of this Canal-based traffic to Peruvian overall commodity imports and exports
- Develop an analysis of the impact of Canal transit cost increases on the overall landed costs of selected commodities
- Develop an analysis on the overall impact of Canal cost increases on the Peruvian economy
- Appraise the ability of different industries within Peru to continue to compete despite the toll difference

2.2 Approach to the Study

To address the commodities that are the most relevant to the Peruvian economy, this report focuses on the highest-volume and highest-value imported and exported commodities that transit the Canal. The report assesses Peruvian imports and exports at a commodity level, aiming for a detailed analysis of approximately 80 percent of total volume that trades through the Canal to and from Peru.

The analysis examines, for each commodity, the relevance of Canal-based traffic to overall country commodity imports and exports; the impact of transit cost increases on overall landed costs; the expected ability to pass on cost increases to end customers; and the overall impact on the country's economy.

The analysis involved the following work steps:

- *Overview of Peruvian maritime trade:* Development of a high-level description of current Peruvian sea trade, including commodities and main partners. This overview allowed the ACP to understand Peru's principal and alternative trade routes, the overall impact of the Panama Canal on shipping, and the impact of key commodity trades on the Peruvian economy.

- *Commodity identification:* Identification of the principal commodities to be analyzed, based on commodity volume and value transiting the Panama Canal.

- *Commodity analysis:* Two-part work step: 1) High-level analysis involving estimation of commodity value, principal transportation cost components, and the percentage of the commodity that transits the Canal. This analysis allowed the ACP to decide which commodities transiting the Canal are significant to the Peruvian economy. 2) For the selected key commodities, a more detailed analysis was completed to determine the impact on shipping costs of a change in Canal toll charges.

- *Economic impact on Peru:* Determined the possible economic impact of potential toll increases for Peru, based on the previous analyses, and assessed whether toll increases would have a significant impact on the Peruvian economy and foreign trade.

The ACP commissioned Mercer Management Consulting, Inc. to undertake the analyses involved in this project. Mercer, which has one of the largest consultancies in the world dedicated to transportation, provided a seasoned team of professionals with extensive knowledge of worldwide trade and transportation, and of the Panama Canal's market and customer base specifically.

3

Overview of Peru's Sea Trade

3.1 Imports and Exports

Peru has the fifth largest population in Latin America, but ranks 11th in terms of per capita GDP. However, during 2001-2003, the Peruvian economy was one of the fastest growing in Latin America, with an average growth rate of 4.8 percent, well above its average GDP growth of 3.7 percent per year during 1994-2003.

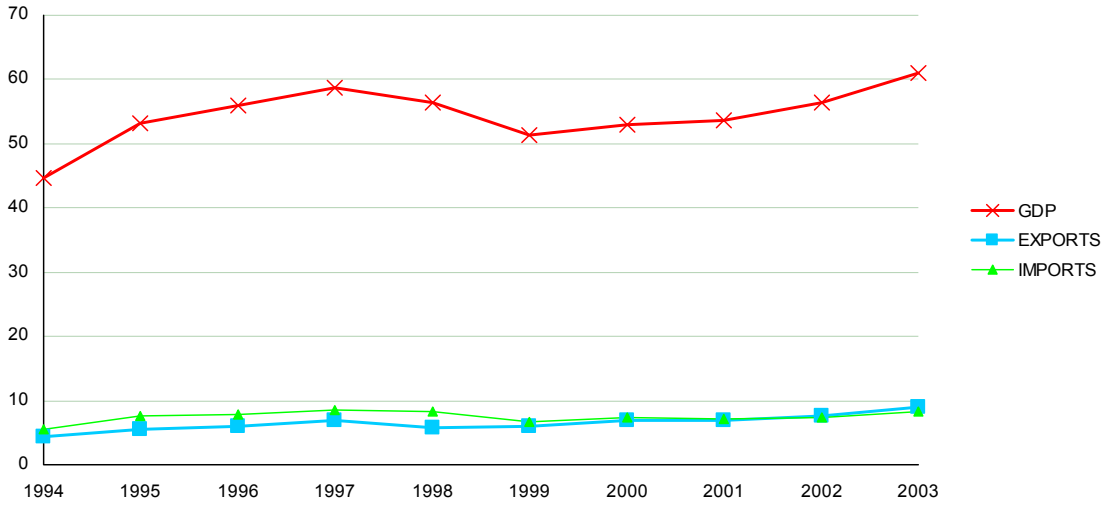
Since 2002, Peru has been a net exporter, reversing its former trade deficit (Exhibit 3-1). The Peruvian economy is not highly dependent on international trade, given that its total trade (exports and imports) accounts for less than 30 percent of GDP (Exhibit 3-2). However, Peru has revealed a strong interest in engaging in new free trade agreements to improve its current account balance.

Between 1994 and 2003, Peruvian goods exports grew at an average annual compound rate of 8.4 percent per year, while merchandise imports grew by 4.6 percent. The share of exports with respect to GDP has been growing steadily during the last 10 years and currently accounts for around 15 percent of GDP, in comparison to 10 percent in 1994.

Exhibit 3-1

Peru's Trade and GDP: 1994-2003

(US$ billions, current prices)

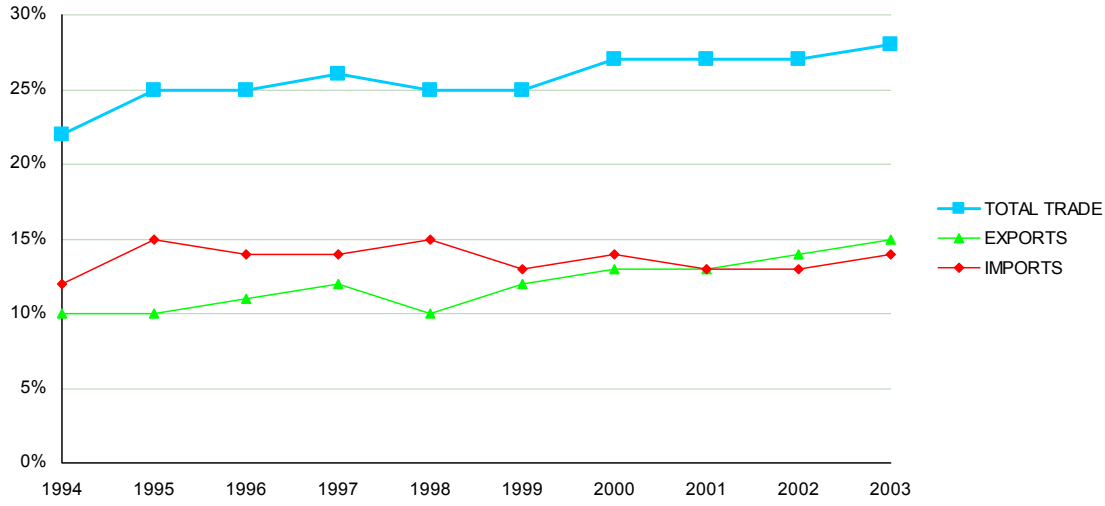


Source: Banco Central de Reserva del Peru.

Exhibit 3-2

Peru's Trade as a Percentage of GDP

(percentage of US$ billions, current prices)



Source: Central Bank of Peru.

In 2002, Peru announced the National Strategic Exports Plan (PENX), whose main objective is to promote and encourage exports as the primary growth engine of the Peruvian economy. President Toledo set a goal of developing foreign trade and doubling Peru's exports to US$13.6 billion by the year 2006. From January to November 2004, total exports reached US$10.2 billion, which means that exports will need to grow by an additional US$3.4 billion to reach the stated goal. In addition, the government has

initiated negotiations with the US to sign a bilateral free trade agreement by 2006 that would likely further increase exports. The government also has underlined the need for greater investment to modernize the country's ports and airports to maintain and improve the country's trade infrastructure.

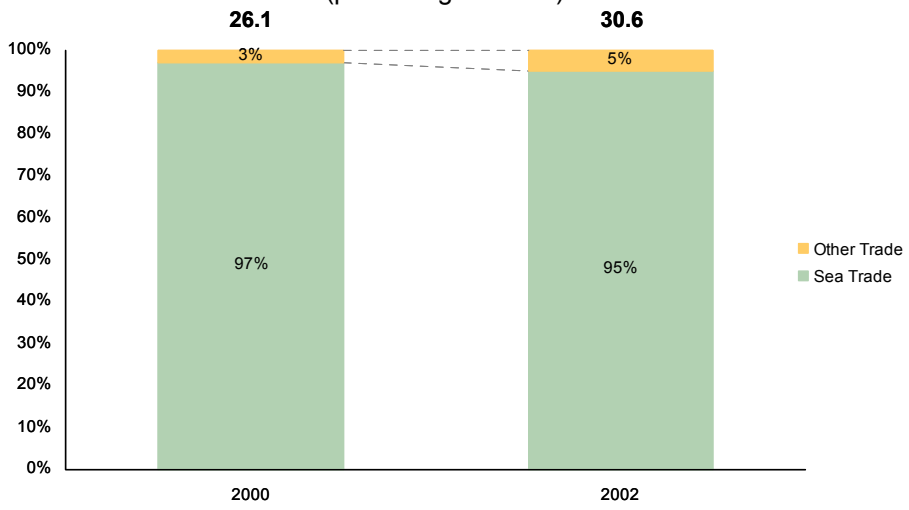
Between 2000 and 2002, Peru's sea trade maintained a stable share of total trade. In tonnage terms, sea trade accounted for approximately 95 percent of total trade (Exhibit 3-3). Waterborne trade represented 71 percent of total trade by value in 2002 (Exhibit 3-4).

Peru has always been highly dependent on sea trade, but this dependence has declined since 1999, when Peru's total trade balance became positive in 2001. Between 2000 and 2002, Peru was a net exporter with respect to sea trade and could remain so if its trade balance continues to be positive. In 2002, Peru's sea exports were 53 percent of total sea trade (Exhibit 3-5).

Exhibit 3-3

Peru Sea Trade as a Percentage of Total Trade: 2000-2002

(percentage of tons)



Source: Economic Commission for Latin America and the Caribbean.

Exhibit 3-4

Peru Sea Trade as a Percentage of Total Trade: 2000-2002

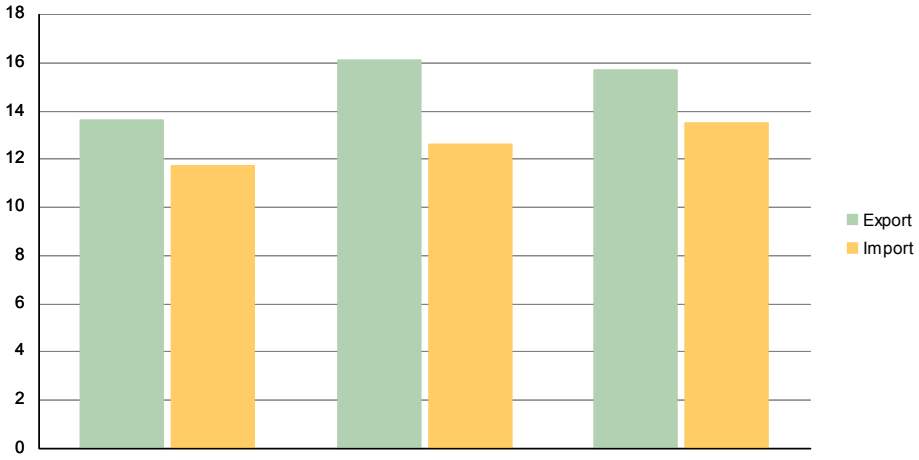
(US$ billions)

Source: Economic Commission for Latin America and the Caribbean.

Exhibit 3-5

Peru Sea Trade, 2000-2002

(millions of tons)



	2000	2001	2002
Exports	53%	56%	53%
Imports	47%	44%	47%

Source: Economic Commission for Latin America and the Caribbean.

3.2 Key Trade Partners

Peru's major trade partners are Asia, Europe, the United States, and South America, which combined accounted for 87 of total trade in tons in 2002. Unilateral trade acts developed by the US over the past few years have been a major driver of Peruvian exports to the United States.

As mentioned previously, Peru was a net exporter through 2002 (last year for which data is available). Given Peru's geographic location, nearly all trade is by sea. Peru's mineral resources and production capacity have resulted in strong exports to the US, Asia, Europe, and South America. These regions accounted for 89 percent of Peru's exports by value in 2002 (Exhibits 3-6).

In terms of sea exports, Asia, Latin America, and the Caribbean countries accounted for 65 percent of Peru's export tonnage (Exhibit 3-7).

Exhibit 3-6

Major Destinations for Peru's Exports: 2002

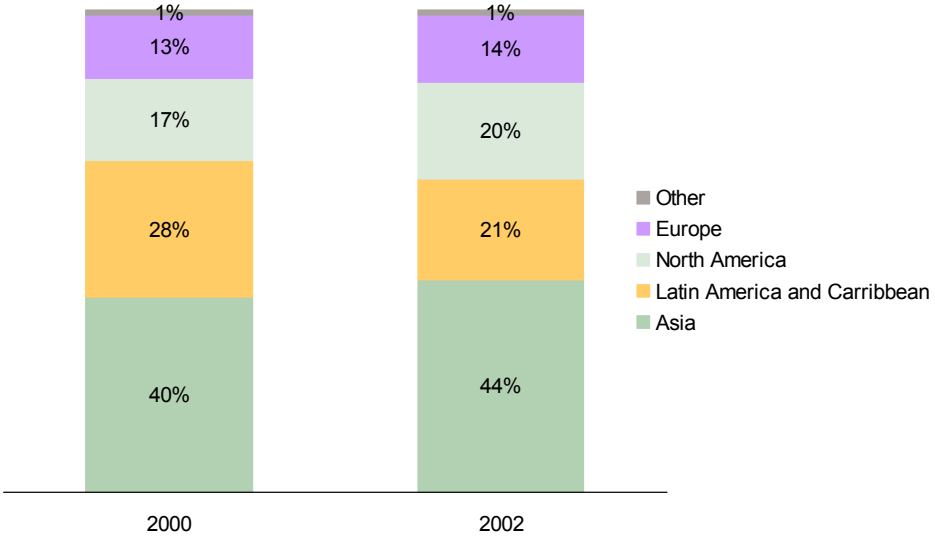
(US$ millions)

Source: Ministerio de Comercio Exterior y de Turismo de Peru.

Exhibit 3-7

Major Destinations for Peru's Sea Exports: 2000 and 2002

(percentage of tons)



Source: Economic Commission for Latin America and the Caribbean.

On the import side, Peruvian imports are primarily raw materials and intermediate goods. In terms of sea trade import value, South America is the most important source of imports for Peru, accounting for 32 percent of imports by value in 2002 (Exhibit 3-8). Asia, the US, and Europe are also very important providers of Peruvian imports and accounted for a stable share of Peru's imports during the 2000-2002 period.

In terms of sea imports, Latin America and the Caribbean countries are by far the largest import partners for Peru, accounting for 66 percent of imports in 2002 (Exhibit 3-9)

Exhibit 3-8

Major Originations for Peru's Imports: 2002

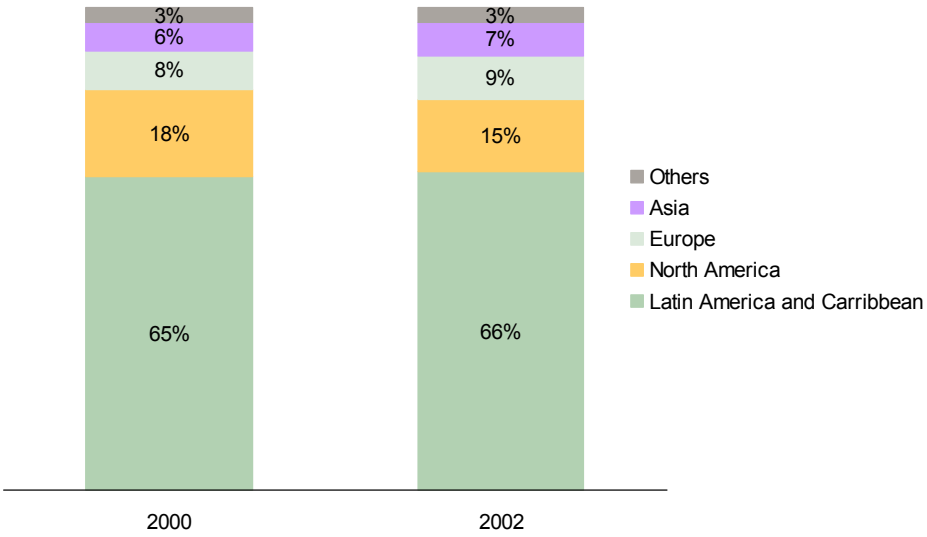
(US$ millions)

Source: Ministerio de Comercio Exterior y de Turismo de Peru.

Exhibit 3-9

Major Originations for Peru's Sea Imports: 2000 and 2002

(percentage of tons)



Source: Economic Commission for Latin America and the Caribbean.

Region-Specific Key Trade Partners

United States

The United States has enacted unilateral trade acts that provide Peruvian goods with duty-free access to its market. For example, the US Andean Trade Promotion and Drug Eradication Act (ATPDEA) has the objective of promoting exports as a means of reducing drug-crop production in Peru. Under ATPDEA, more than 6,000 products are allowed to enter duty-free into the United States. New markets for Peruvian products are in the process of development, due to advantageous preferential treatment, including the Generalized System of Preferences (GSP) and Most Favored Nation (MFN) status.

As a result of ATPDEA, Peruvian exports to the US increased by 12 percent from 2001 to 2002, from $US1.75 billion to $US1.96 billion. As a result, the share of Peru's total exports to the US grew by one percent, to 26 percent of total exports.

The US is Peru's third largest import partner. Between 2001 and 2002, imports from the US to Peru decreased from $1.62 billion to $US1.41 billion, representing a decline in share from 23 percent to 19 percent.

The principal commodities imported from the United States are wheat, corn, fertilizers, and container cargo. Imports from the US are expected to show significant growth as a result of the Free Trade Agreement being developed with the US, once it is approved. This increase will be reflected mainly in container cargo, while grain imports from the US, which are based on per capita consumption, can be expected to follow population trends.

Asia

Asia (China and Japan) is the most important growth market for Peruvian exports. In the last five years. Asia has become Peru's biggest destination for exports in tonnage terms, and between 1998 and 2002, Asia's share of Peru's total exports (in tons) grew from 38 percent to 44 percent. This shift in exports towards Asia is driven by demand for copper and other mineral ores. Peru also exports fishmeal to Asia. By increasing bilateral ties with China, Peru will gain export revenue as well as bargaining power with the United States.

In value terms, Asia is Peru's third largest export partner, and a fast growing market: between 2001 and 2002, exports to Asia from Peru grew by 12 percent, from $US1.29 billion to $US1.45 billion,.

Asia is Peru's second largest regional partner for imports, with China, Korea ,and Japan providing the bulk of these imports. The main commodities imported from China are coal and coke; and from Japan and Korea, container cargo. Imports from Asia have also

grown significantly, between 2001 and 2002 they grew by 10 percent, from $US1.35 billion to $US1.49 billion.

Europe

Peru-EU trade policy is similar to Peru-US policy; for example, the National Plan for the Fight Against Drugs, which gives additional preferences to countries that are fighting drug trafficking, provides Peru with duty-free access to the EU for industrial and agricultural goods. Peru also benefits from other unilateral trade acts, such as GSP and MFN status. Peru has enjoyed the biggest increase in exports due to EU trade policy of any Andean country. The impact of a Free Trade Agreement between Peru and the EU is still under debate.

Europe is one of Peru's largest export markets, and in 2002, 35 percent of its export tons were destined for Europe. Within Europe, the UK is Peru's largest import partner, followed by Spain, Italy, the Netherlands, and Belgium. Peru mainly exports copper ore, other mineral ores, fishmeal, and agricultural products to Europe. With respect to imports, Europe is Peru's fourth largest partner.

South America

Peru has multiple trade agreements with several South American countries and regions. Agreements with countries such as Ecuador, Colombia, and Venezuela are primarily designed to lower import taxes between the involved parties over a determined period of time for specific products. Peru also has a free trade agreement with Bolivia in which none of its products are subject to import taxes.

South America as a whole is the fourth largest importer of Peru's products, with 9 percent of total export tons destined for this region. South America is also Peru's largest source of imports, accounting for 32 percent of tons. Venezuela, Argentina, and Chile are Peru's main import trade partners within the region. The main commodities imported from Argentina are corn and wheat; from Chile, container cargo; and from Venezuela, crude oil, chemicals, and container cargo.

3.3 Key Trade Commodities

Peru's exports reflect its geography: abundant mineral resources in the Andes, and fishing resources along the Pacific shore. In 2002, minerals accounted for 58 percent of sea exports in tonnage, and 43 percent by value. The main mineral exports are gold, copper, zinc, lead, silver, tin and iron ore, and other mineral ores. Oil products also play an important role in exports, and accounted for 14.5 percent of sea traded export tonnage, and 6.6 percent of sea exports by FOB value. Fishmeal and fish oil are the major exported fishing resources. In 2002, fishmeal accounted for 10 percent of seaborne

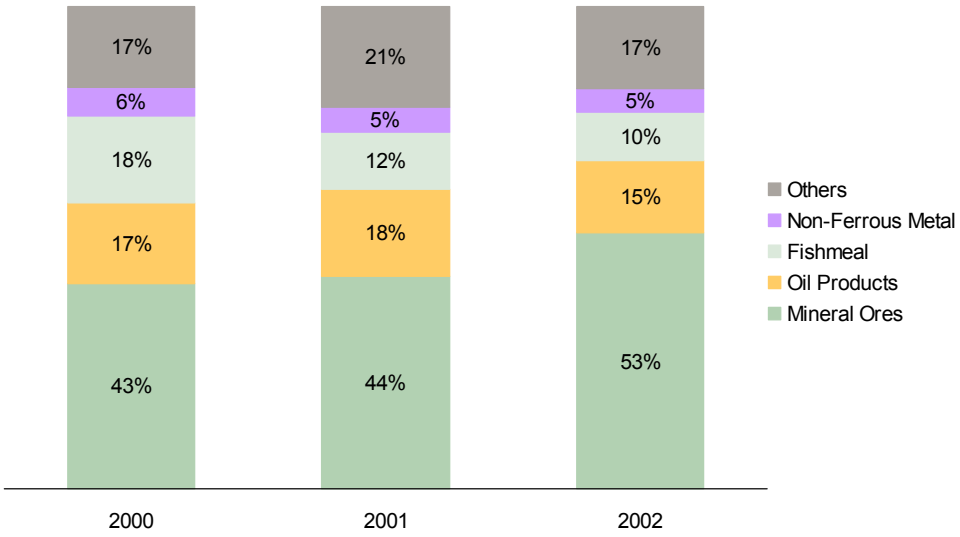
exports by weight and 16 percent of seaborne exports by FOB value (Exhibits 3-10 and 3-11).

Between 2000 and 2002, Peru's fishmeal exports decreased as a percentage of sea export tonnage, from 18 percent to 10 percent, while mineral ore exports gained share, increasing from 43 percent to 53 percent. However, over-dependence on mineral and metal ores makes the economy susceptible to fluctuations in world prices. Gold represents the biggest export increase in the last 10 years. The increase in mineral ore exports has also meant that the share of dry bulk cargo moving by sea has increased with respect to other types of cargo.

Exhibit 3-10

Peru's Sea Exports: Key Commodities by Weight

(percentage of tons)

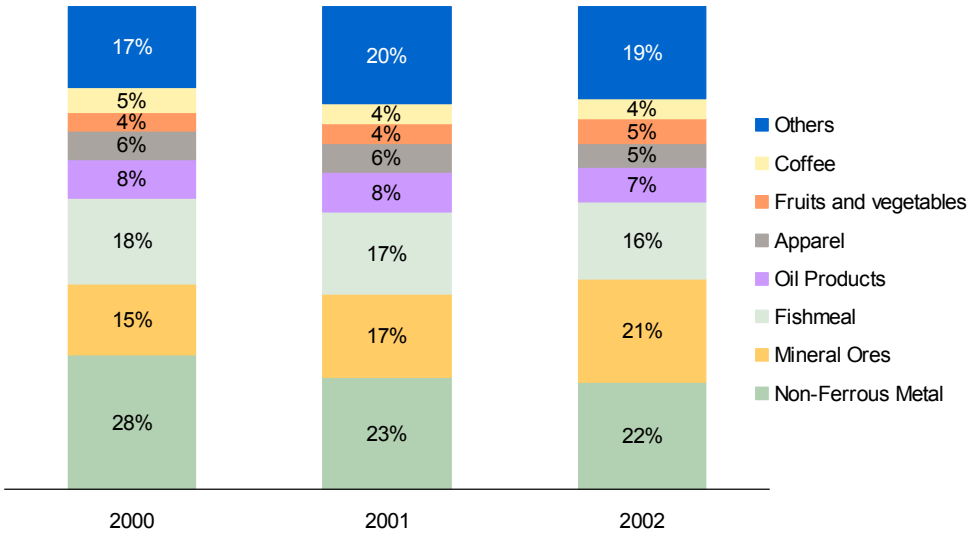


Source: Economic Commission for Latin America and the Caribbean.

Exhibit 3-11

Peru's Sea Exports: Key Commodities by Value

(percentage of US$)



Source: Economic Commission for Latin America and the Caribbean.

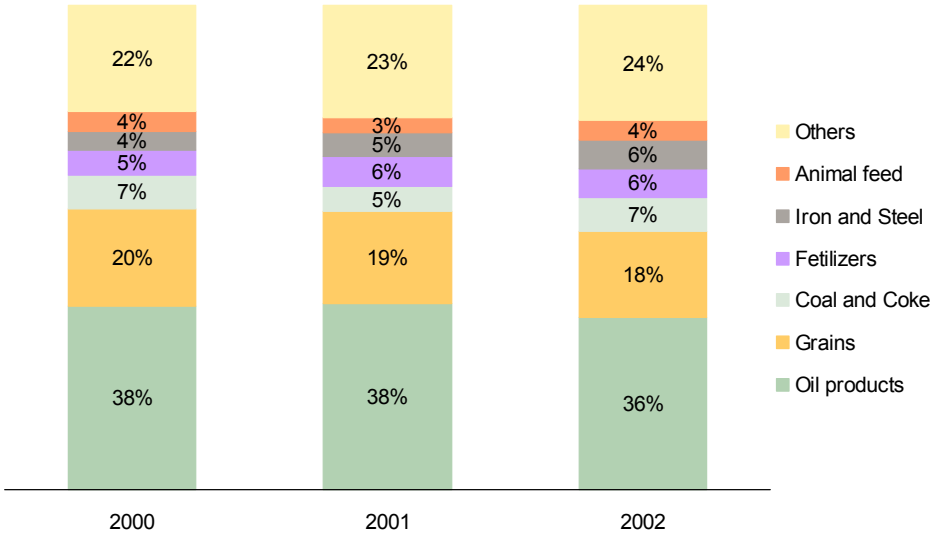
On the import side, approximately 75 percent of Peru's total sea import tons are raw materials and capital goods for Peru's industrial sector. The most important imported raw materials are oil products, grain, coal, and coke, fertilizers, and iron and steel, with oil products and grain accounting for more than half of total import tonnage. Between 2000 and 2002, the relative share of these major commodities' imports was fairly stable (Exhibit 3-12).

Imports by value are highly fragmented, with many high-value commodities imported in containers. However, oil products and grain are still key imports in value terms (Exhibit 3-13).

Exhibit 3-12

Peru's Sea Imports: Key Commodities by Weight

(percentage of tons)

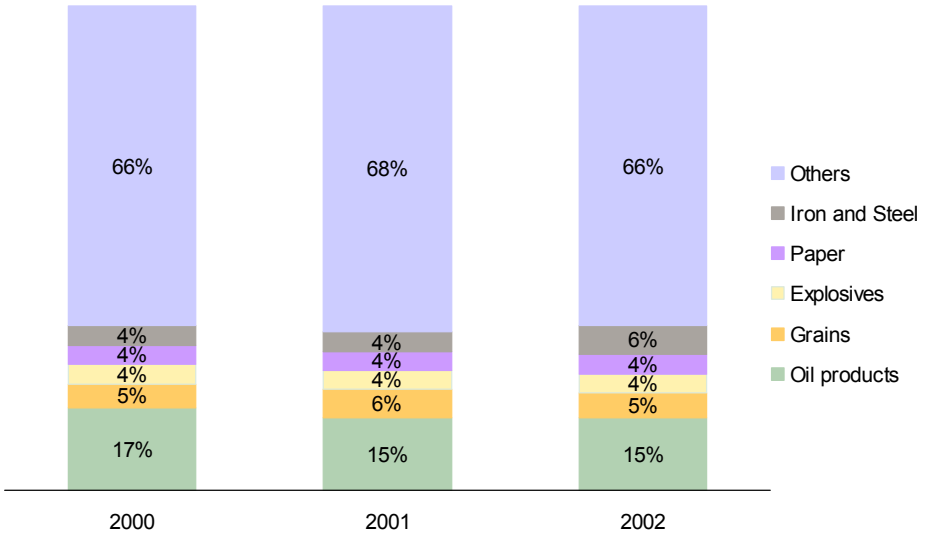


Source: ECLAC Economic Commission for Latin America and the Caribbean.

Exhibit 3-13

Peru's Sea Imports: Key Commodities by Value

(percentage of US$)



Source: Economic Commission for Latin America and the Caribbean.

3.4 Peru's Market Trends and Challenges

In 2002, the country's four-year recession came to an end, and Peru has since seen robust economic recovery and growth. A boom in manufacturing for export-related sectors explains part of this strong performance. The mining and energy industries remain very attractive sectors of the Peruvian economy, and with continued capital flow from investors, they will likely continue to provide long-term benefits. The privatization of Empresa Minera del Peru (major mining company) and Petroleos de Perú (leading oil company) is expected to continue improving prospects for the minerals and energy sectors.

It is expected that continuing economic expansion in both developed and newly industrializing countries, particularly Asia, will increase Peruvian exports of traditional commodities and raw materials to these regions. It is also expected that the FTA with the United States will first impact Peru's imports, with a delayed effect on exports, due to the fact that there are few firms in Peru with the necessary capabilities for exporting to international markets.

In order to maintain positive momentum in the economy, Peru will need to overcome certain challenges, including its reliance on mineral ores and metals to earn international currency, as this subjects the economy to strong fluctuations in world price changes.

Callao is Peru's main port and trade gateway. In 2003, Callao handled 78 percent of Peru's total sea trade and 88 percent of all container trade. The port is reaching its capacity limits due to an export boom driven by US and Chinese demand for goods, such as minerals, textiles, asparagus, and coffee. Additionally, relative to other countries, Peru's port costs are high, even when compared with other ports in the region (e.g., Chile and Argentina). Both capacity requirements and port costs will need to be addressed if exports are to continue to drive Peru's growth.

4

Peru and the Panama Canal

4.1 Trade Routes Relevant to the Panama Canal

Given Peru's geographical location, trade with only a few of its important trade partners must transit the Panama Canal. Its major Canal-relevant trade lanes (both for exports and imports) are to/from the East Coast US, Europe, and the East Coasts of South and Central America (Exhibit 4-1).

Exhibit 4-1

Panama Canal-Relevant Export Trade Routes for Peru: 2003

(million tons)

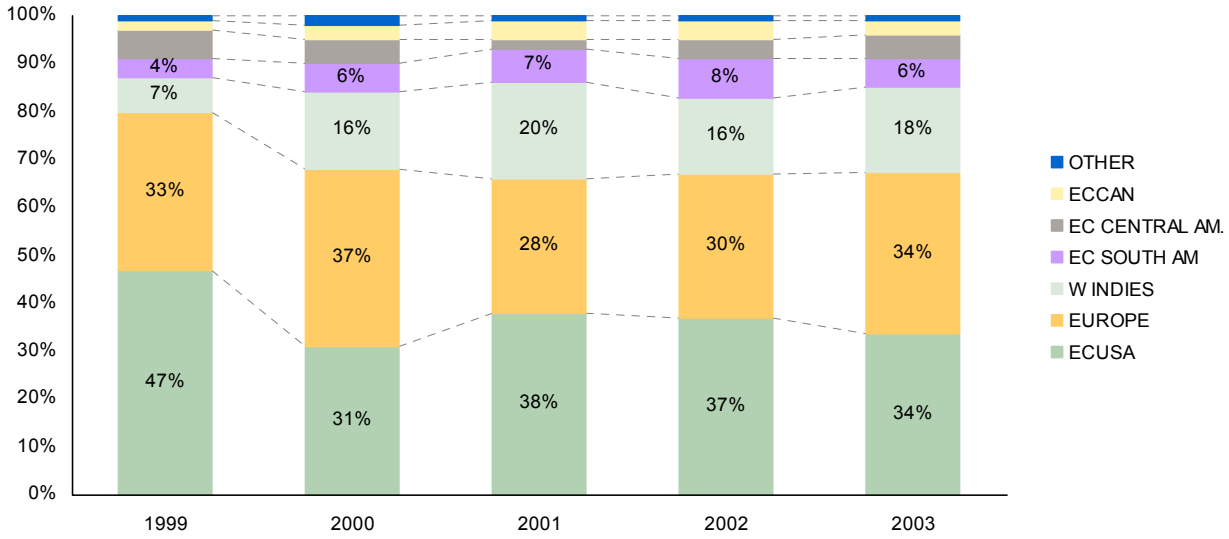
Source: Panama Canal Authority (ACP).

Panama Canal-relevant Peruvian exports amounted to 5.6 million tons in 2003, or around 35 percent of Peru's total sea exports.[1] Peruvian exports through the Panama Canal can be broken down into three primary trade lanes: Peru to the East Coast US, Peru to Europe, and Peru to the West Indies. Between 1999 and 2003, trade from Peru to the West Indies grew by an average compound rate of 31 percent, while trade in the other two relevant lanes remained fairly stable (Exhibit 4-2).

Exhibit 4-2

Peru's Canal-Relevant Export Trade Partners: 1999-2003

(percentage of tons)



Source: Panama Canal Authority (ACP)

The most important trade lanes for Peru's imports are from East Coast South America, the East Coast US, Europe, and the West Indies. Together, these trade partner regions provided 93 percent of Peruvian import tons that flow through the Canal (Exhibit 4-3).

Panama Canal relevant Peruvian imports amounted to 5.8 million tons in 2003, or around 40 percent of Peru's total sea imports.[2] From 1999 to 2003, Peru's imports from Europe increased by an average compound rate of 12 percent per year. This trade lane has increased in share, while trade from the East Coast US and East Coast South America have decreased in share. (Exhibit 4-4).

[1] ECLAC, ACP.
[2] ECLAC, ACP.

Exhibit 4-3

Panama Canal-Relevant Import Trade Routes for Peru: 2003

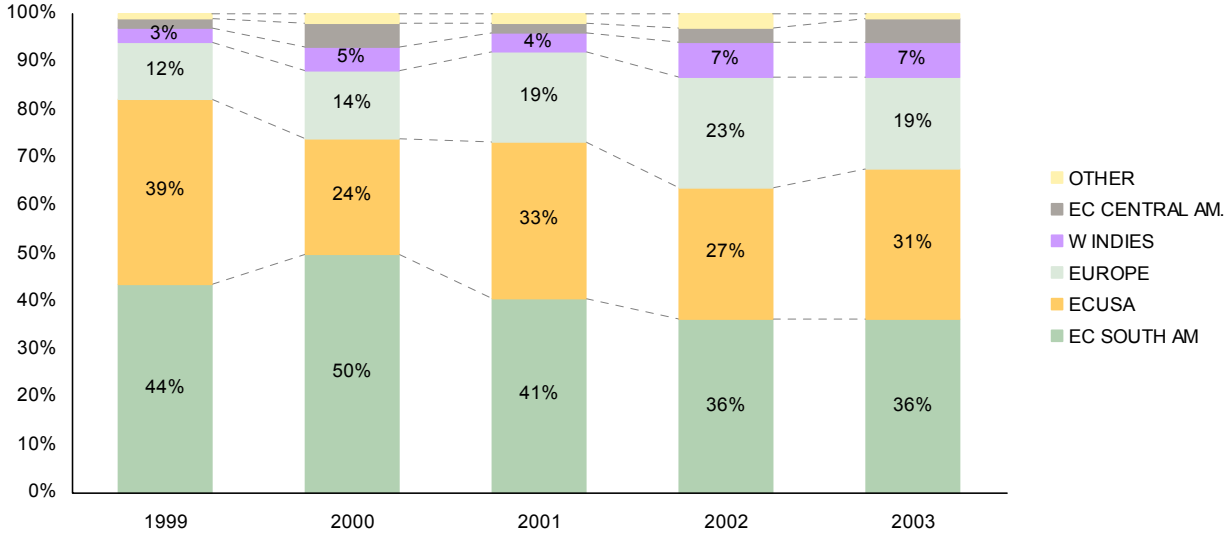
(million tons)

Source: Panama Canal Authority (ACP).

Exhibit 4-4

Peru's Canal-Relevant Import Trade Partners: 1999-2003

(percentage of tons)



Source: Panama Canal Authority (ACP).

East Coast United States

The East Coast US (ECUS) is the most important Canal-relevant trade partner for Peru. In total Peruvian imports and exports moving in this trade lane account for 33 percent of Peru's total Canal-relevant trade.

In 2003, approximately 2 million tons of Peruvian exports transited the Panama Canal from Peru to the ECUS. Exports to the ECUS relative to total Peruvian exports transiting the Canal have decreased from 47 percent to 34 percent during 1999-2003, as seen in Exhibit 4-2.. The main exported commodities moving from Peru to the ECUS are salt with 21 percent share of tons, followed by cement (10 percent), copper metal and copper ore (8 percent), residual fuel oil (8 percent), zinc (6 percent), gasoline (6 percent), crude petroleum (5 percent), and container cargo (5 percent).

The ECUS is also the second largest provider of Canal-relevant imports to Peru: In 2003, Peru imported 1.5 million tons from the ECUS that transited the Panama Canal. The US share of Peru imports passing through Panama Canal has fluctuated at around 30 percent (Exhibit 4-4). The main imported commodities from this region are wheat (41 percent of total imported commodities transiting the Canal), followed by container cargo (12 percent), fertilizers (7 percent), chemicals (5 percent), lubricating oil (4 percent), and flour (4 percent).

Europe

Europe is the second most important Canal-relevant trade partner for Peru. In total, Peruvian imports and exports moving in this trade lane account for 26 percent of Peru's total trade transiting the Canal.

Europe is the second largest trade partner for Peruvian exports: In 2003, Peruvian exports to Europe accounted for 34 percent of total Peruvian exports transiting the Canal, as seen in Exhibit 4-2. From 1999 to 2003, the tonnage flowing in this trade lane increased by 5 percent. The European Union accounts for almost 84 percent of Peru's total exports to Europe. Peru's primary exports to the EU are zinc metal and zinc ore (34 percent of the tonnage transiting the Canal in this trade lane), copper metal and copper ore (19 percent), container cargo (17 percent), and fishmeal (17 percent).

Europe is also Peru's third largest import partner (Exhibit 4-4). Between 1999 and 2003, Europe's share of Peruvian imports passing through Panama Canal fluctuated at around 17percent; imports from Europe to Peru that transit the Canal increased by 12 percent. The European Union represents 60 percent of the imports from Europe. Within this trade lane the main imported commodities are fertilizers (26 percent of the tonnage transiting the Canal in this trade lane), container cargo (24 percent), wheat (21 percent), and iron and steel (9 percent).

East Coast South America

East Coast South America (ECSA) is the third most important Canal-relevant trade lane for Peru. In total Peruvian imports and exports moving in this trade lane account for 22 percent of Peru's total Canal trade.

The ECSA is Peru's fourth largest Canal-relevant export destination. In 2003, Peruvian exports transiting the Canal to the ECSA accounted for 6 percent of total Peruvian exports transiting the Canal, as seen in Exhibit 4-2. Between 1999 and 2003, the tonnage flowing in this trade lane increased by 15 percent. Colombia and Venezuela are Peru's principal export trade partners within this region, accounting for 97 percent of Canal trade in this lane. Major commodities Peru exports to the ECSA include container cargo and soybeans, which account for 89 percent of Peru's exports transiting the Canal on this route.

The ECSA is the largest provider of Peru's imports; in 2003, 36 percent of Peru's imports that transited the Canal were from this region. Since 1999, tonnage transiting the Canal from this region and the share of imports decreased by 6 percent and 4 percent, respectively. Colombia and Venezuela accounted for 97 percent of total Peru imports transiting the Canal from the ECSA. Within this trade lane, the main imported commodities are crude petroleum (25 percent of tonnage), coal (16 percent), gasoline (13 percent), container cargo (10 percent), liquefied petroleum gas (8 percent) and jet fuel (7 percent).

West Indies

The West Indies (WI) includes the countries of Trinidad and Tobago, Cuba, Haiti, the Dominican Republic, Jamaica, and Puerto Rico. Trinidad and Tobago is generally the most important in terms of trade. The West Indies region is the fastest growing Canal-relevant trade partner for Peru, both for imports and exports.

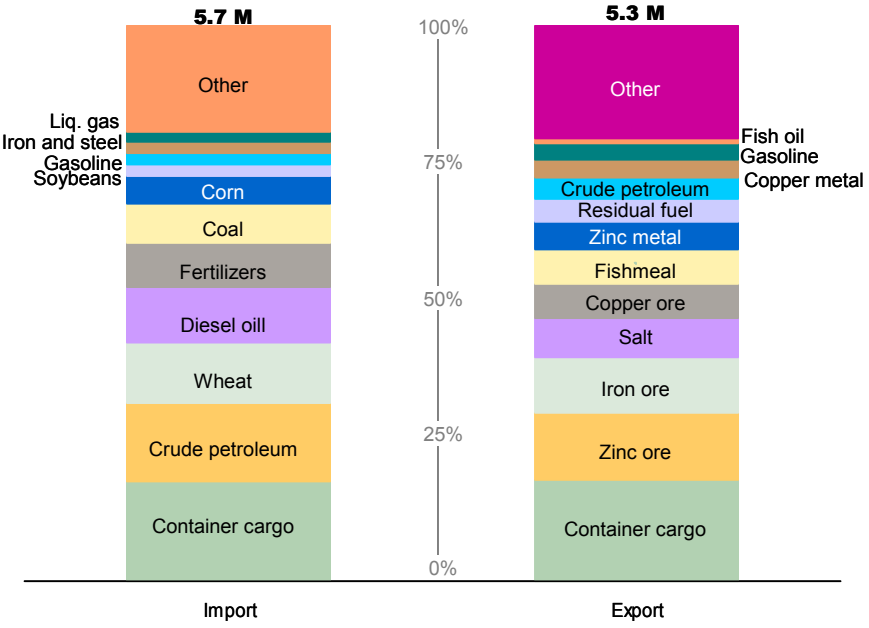
The West Indies is the third largest Canal-relevant export destination for Peru. In 2003, Peruvian exports transiting the Canal to the WI accounted for 18 percent of total exports transiting the Canal, as seen in Exhibit 4-2. Between 1999 and 2003, the tonnage flowing in this trade lane increased by 31 percent. Trinidad and Tobago accounted for 48 percent of Peru's total exports to the WI. Peru's principal commodities exported to this region through the Canal in 2003 were iron ore (50 percent of tonnage), container cargo (21 percent), and crude petroleum (12 percent).

The WI trade lane represents only a small share of Peru's total Canal-relevant imports (7 percent in 2003), however, the West Indies' share of total Peruvian imports transiting the Canal has increased by 24 percent since 1999. Container cargo and crude petroleum are the most relevant imports from this region, accounting for 55 and 25 percent of Canal-relevant imports from this region.

4.2 Peruvian Imports/Exports through the Canal

For the purposes of this report, Mercer analyzed Peruvian trade that transits the Panama Canal using the "80/20 rule," i.e., those commodities comprising 80 percent of Panama Canal tonnage (exports and imports) were analyzed. Based on this framework, the key commodities transiting the Canal are shown in Exhibit 4-5.

Exhibit 4-5
5 year Average Peru Relevant Panama Canal Trade
(percentage of tons)



Source: ACP.

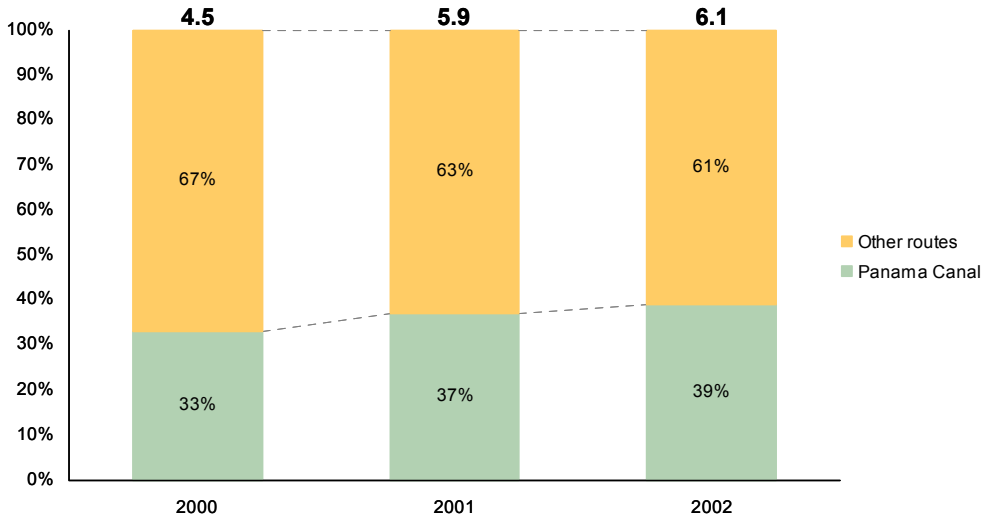
During 2000-2002, Peru's exports through the Panama Canal increased from 33 percent to 39 percent of total sea export tons (Exhibit 4-6). The share of Peruvian exports moving through the Panama Canal has increased due to growth in exports to the East Coast US, the East Coast Canada, the ECSA, and the West Indies. Overall, Peru's sea exports increased annually by an average of 7.4 percent per year during 2000-2002, while its exports through the Panama Canal increased by 16 percent per year over the same period.

As shown in Exhibit 4-7, over the past five years, zinc ore, iron ore, salt and container cargo have accounted for nearly half of Peru's exports through the Canal. However, some Canal-relevant exports have decreased in share significantly, such as crude petroleum and salt.

Exhibit 4-6

Share of Peru's Exports Moving Through the Panama Canal: 2000-2002

(percent of tons)

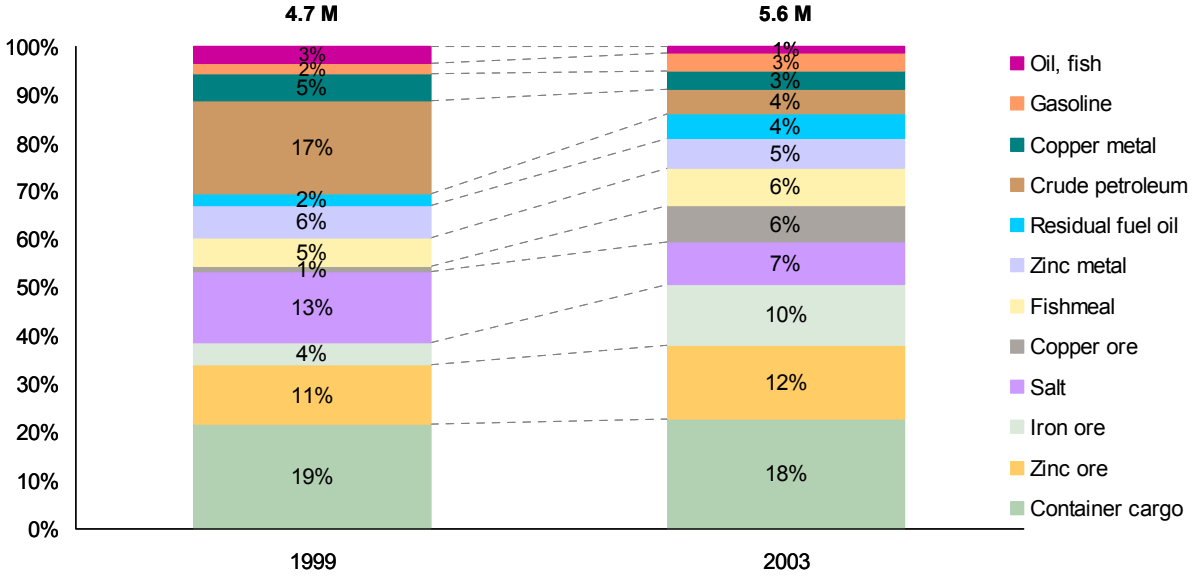


Source: Economic Commission for Latin America and the Caribbean, ACP.

Exhibit 4-7

Canal-Relevant Peruvian Exports by Commodity

(percentage of tons)



Source: ACP.

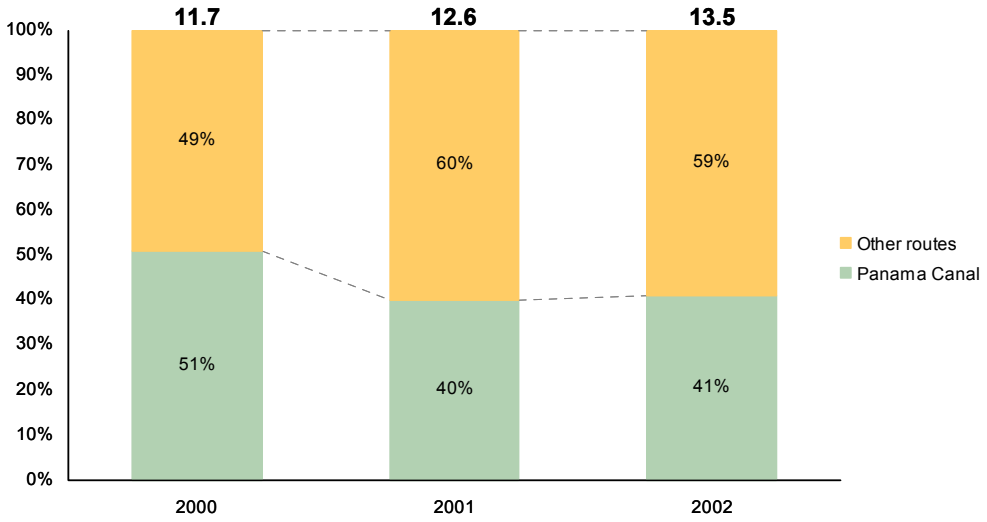
On the import side, between 2000 and 2002, Peru's imports through the Panama Canal decreased from 51 percent to 41 percent of total sea import tons, mainly due to a decrease in imports from the East Coasts of Central and South America (Exhibit 4-8).

Between 1999 and 2003, the composition of Peru's imports through the Panama Canal changed significantly. Shares of Canal-relevant import trade tons increased by 28 percent for container cargo and 54 percent for wheat. The share of corn relative to Peru's imports decreased from 10 percent to 1 percent, and this has become practically an insignificant import commodity through the Canal. The share of diesel oil also decreased, dropping from 14 percent share of imports to 4 percent. Crude petroleum, container cargo, and wheat remain the most significant Peruvian imports transiting the Panama Canal (Exhibit 4-9).

Exhibit 4-8

Share of Peru Imports Moving Through the Panama Canal: 2000-2002

(percentage of tons)

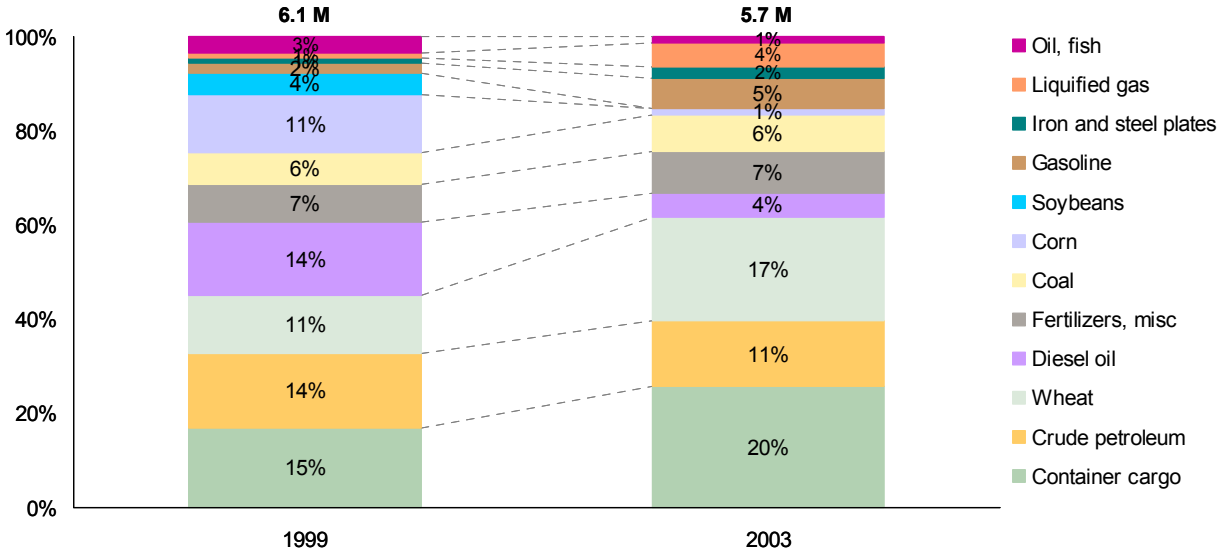


Source: Economic Commission for Latin America and the Caribbean, ACP.

Exhibit 4-9

Canal-Relevant Peruvian Imports by Commodity: 1999-2003

(percent of tons)



Source: ACP.

4.3 Canal-Relevant Peruvian Export Commodities

4.3.1 Zinc

Zinc is used as a coating to protect iron and steel from corrosion (galvanized metal), as an alloying metal to make bronze and brass, as a zinc-based die casting alloy, and as rolled zinc.

In 2002, Peru was the third largest producer (after China and Australia), and the second largest exporter of zinc ore and concentrates in the world. Peru primarily exports zinc ore, but exports of refined zinc metal have outpaced the growth of ore concentrates as producers are looking to process and refine the ore locally. Zinc ores and metal account for almost 15 percent of mining exports and almost 7 percent of Peru's total exports by value (Exhibit 4-10).

Asia is expected to continue to lead demand for zinc metal. China, with 23 percent of the world's zinc smelting capacity, has become one of the biggest importers of zinc concentrates. Southern Asia has the potential to become a significant zinc consumer as well. Western South America is expected to meet much of this demand.

Since trade to Asia will not transit the Panama Canal, the relevant issue for the Canal is primarily ECUS demand and, secondarily, European demand. Europe in particular, will require new sources of zinc concentrates over the next few years.

Exhibit 4-10

Peru's Zinc Exports: 2002

(percentage of US$)

Source: Central Bank of Peru.

4.3.2 Fishmeal

One-third of commercially caught fish is used as raw material for fishery byproducts, the most important of which are fishmeal. The main use of fishmeal is to produce feed for animals such as poultry, pigs, ruminants, and fish in aquaculture.

Peru is the world's largest producer and exporter of fishmeal. In 2003, Peru accounted for more than 40 percent of the world's fishmeal exports. Fishmeal accounts for almost 72 percent of fishing product exports and almost 8 percent of Peru's total exports by value (Exhibit 4-11). Other major exporters include Chile and the Scandinavian countries (Iceland, Norway and Denmark).

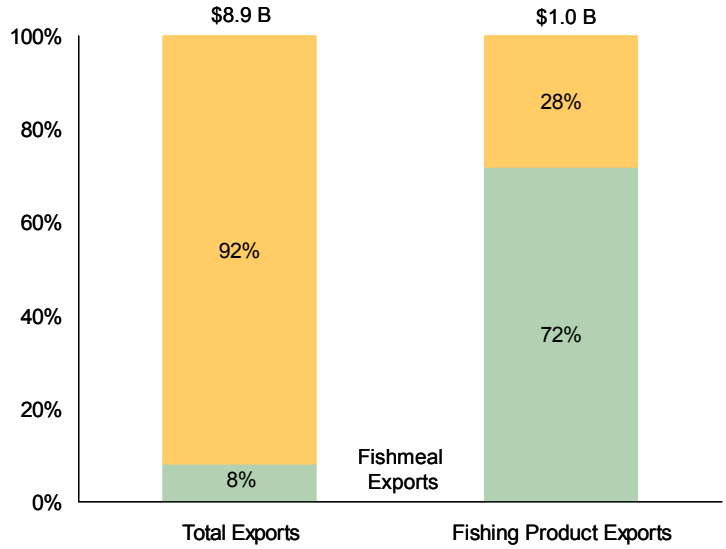
Only about 9 percent of the world's trade in fishmeal transits the Panama Canal. The Panama Canal is a major conduit for South American fishmeal (mainly from Peru and Chile). Around 80 percent of the fishmeal that transits the Canal originates in Peru, with its primary destination being Europe. Since trade to Asia will not transit the Panama Canal, the relevant issue for the Canal is primarily European demand.

In recent years the European Union has created discriminatory measures against fishmeal, demanding salmonella and bacterial analysis, and banning the use of fishmeal in ruminant diets due to mad cow disease. These restrictions have had a significant impact on Peru's Canal-relevant fishmeal exports. In the next few years, the market for fishmeal is expected to continue to trend away from Europe and toward Asia, particularly as Asia increases its focus on aquaculture.

Exhibit 4-11

Peru's Fishmeal Exports: 2002

(percentage of US$)



Source: Central Bank of Peru.

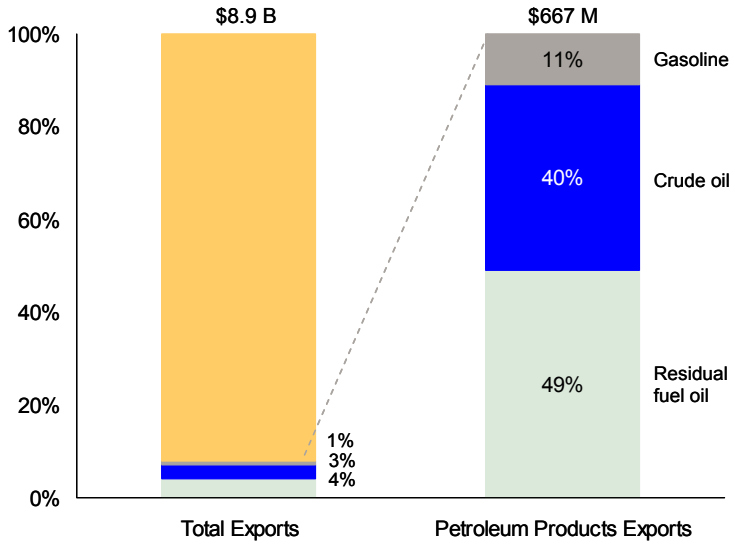
4.3.3 Petroleum Products

Peru's major exported petroleum products include crude oil, residual fuel oil, and gasoline. These three products together account for 8 percent of total exports by value. (Exhibit 4-12) Each commodity is discussed separately in the sections below.

Exhibit 4-12

Peru's Petroleum Product Exports: 2002

(percentage of US$)



Source: Central Bank of Peru, Ministry of Commerce and Tourism Peru, Mercer analysis.

Crude Oil

More than 32 million barrels of crude oil travel on inter-regional trades routes in the world annually, and an additional 10 million barrels per day travel on shorter intra-regional trade routes as well. Of this global volume, less than 90,000 barrels per day has transited the Canal in recent years, representing less than 0.3 percent of global activity. Consequently, the Canal's role in the movement of crude oil is very limited. The recent re-activation of the Trans Panama Crude Oil Pipeline (PTP) in November 2003 is expected to curtail the growth of Canal crude oil traffic in the future.

With respect to Peru, crude oil products account for 40 percent of petroleum product exports and 3 percent of Peru's total exports by value (Exhibit 4-12). Crude oil production has decreased, with output dropping by 4.2 percent annually between 1995 and 2003. A combination of poor drilling results and unattractive royalty terms resulted in some companies abandoning activities in Peru in the late 1990s. In an attempt to boost oil exploration and production activities, the Peruvian government has established new royalty incentives.

The Panama Canal is a major conduit for South American and Central American crude oil, mainly from countries like Ecuador, Venezuela, Colombia, Peru, and Chile. Only 5 percent of the crude oil that transits the Canal originates in Peru, primarily destined for the West Indies and the ECUS.

Residual Fuel Oil

Residual fuel oil (RFO) is the primary oil refining byproduct, a heavy, highly viscous fuel that is high in energy per unit of weight but difficult to handle. It is used as fuel for electric power generation, for industrial boilers and furnaces, and for large diesel ship engines and the few steamships remaining in the world.

World production and demand for RFO has been declining since the late 1970s. At present, Venezuela and Russia are among the largest sources of RFO. The largest single geographic market for RFO is the United States, with major oil-fired power plants located in the Northeast and Florida. In the Caribbean and Central America, RFO is a vital element of power generation.

The only growing market for RFO is the marine diesel marketplace, with more RFO moving from Venezuela and other countries to places such as Panama for sale to passing ships than ever before. The global marine diesel market has historically relied on RFO at major ports near refinery centers, such as Houston, Singapore, Rotterdam, Saudi Arabia, the Caribbean, and Venezuela.

With respect to Peru, residual fuel oil exports account for 49 percent of petroleum product exports and 4 percent of Peru's total exports by value (Exhibit 4-12). Residual fuel oil production is totally dependent on crude oil production, which as mentioned above has been declining in Peru. The Peruvian government however has established royalty incentives in order to enhance oil exploration and production.

The Panama Canal is a major conduit for South American, Central American, and US residual fuel oil, including from countries such as Venezuela, Peru, Chile, Ecuador, and Colombia. Only 10 percent of the residual fuel oil that transits the Canal originates in Peru. The major destinations for Peruvian residual fuel oil are the ECUS and the West Indies.

Gasoline

Gasoline is traded throughout the world as the primary auto fuel in much of the developed world and a rival to diesel fuel for light trucks and commercial vehicles as well as many smaller boats and yachts.

Peru's gasoline exports account for 11 percent of petroleum product exports and 1percent of Peru's total exports by value (Exhibit 4-12). Gasoline production is totally dependent on crude oil production, which as mentioned previously has decreased in recent years. The Peruvian government however has established royalty incentives in order enhance oil exploration and production.

The Panama Canal is a major conduit for gasoline moving to South America, ECUS, Central American and Asia, mainly from countries like Venezuela, China, Peru, Chile, Ecuador, and Colombia. Only 3 percent of the gasoline that transits the Canal is from Peru. The major destination for Peruvian gasoline transiting the Canal is the ECUS.

4.3.4 Iron Ore

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Iron ore is the source of primary iron for the world's iron and steel industries. Almost all (98 percent) of iron ore is used in the steel making process.

Peru is not a major iron ore producer. Australia and Brazil, with roughly equal shares, dominate the export market, with a combined share of world iron ore exports of 62 percent. Iron ore accounts for almost 3 percent of mining exports and 1.4 percent of Peru's total exports by value (Exhibit 4-13).

Asia is the natural market for iron ore from West Coast South America, and Chinese interests control the biggest producer of iron ore in Peru. Since trade to Asia will not transit the Panama Canal, the relevant issue for the Canal is primarily European demand.

The Panama Canal is a major conduit for the South American iron ore, mainly from countries like Peru, Brazil, and Chile. Around 50 percent of the iron ore that transits the Canal originates in Peru. The major destination for Peruvian iron ore transiting the Canal is the West Indies.

Exhibit 4-13

Peru's Iron Ore Exports: 2002

(percentage of US$)

Source: Central Bank of Peru.

4.3.5 Salt

Salt is produced and traded globally for a number of uses, the most important being for chemical production, road de-icing, and direct consumption. Salt is found in almost all countries of the world and is mined in a variety of ways. Consumption is tied to overall economic activity, with higher usage levels in northern regions because of salt's use as a de-icer. North America is the largest consumer of salt.

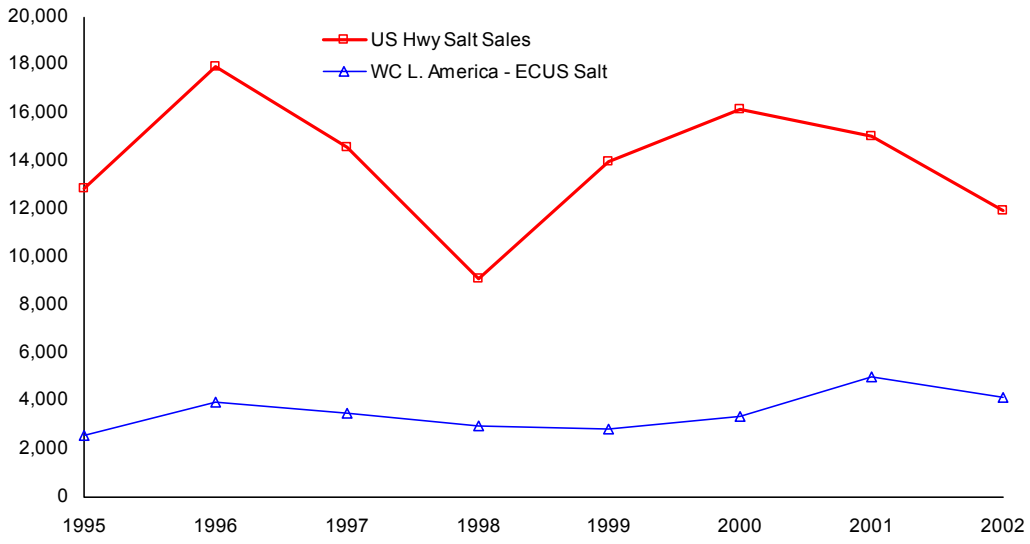
Ninety-one percent of salt transiting the Canal moves eastbound from the West Coast of Latin America to the United States (primarily from Chile, Mexico, and Peru). Of the salt arriving on the US Gulf and US East Coasts, 86 percent is destined for the North Atlantic ports of New York, Portland, Baltimore, Boston, Philadelphia, Providence, and Norfolk. There is a moderately strong correlation between US highway salt sales and eastbound Canal salt volume (Exhibit 4-14).

Salt only accounts for 0.07 percent of Peru's mining product exports and around 0.04 percent of total exports by value (Exhibit 4-15) . Around 7 percent of the salt that transits the Canal originated from Peru; Peruvian salt exports are destined for the ECUS.

Exhibit 4-14

Canal Salt Traffic versus US Highway Salt Sales: 1995-2002

(000 tons)



Source: ACP, Salt Institute.

Exhibit 4-15
Peru's Salt Exports: 2002
(percentage of US$)

Source: UN COMTRADE, Central Bank of Peru.

4.3.6 Copper

Copper is used in building construction, electronics and electronic products, transportation, industrial machinery, and consumer and general products. All end-use demand is for refined copper; concentrates are refined either in the exporting or importing country.

In 2003, Peru was the fifth largest producer of copper in the world (after Chile, Indonesia, the US, and Australia) and the fourth largest exporter. The WCSA is the world's largest exporting region of copper concentrates, while Asia and Europe are the largest importers of copper ores.

Copper trade through the Canal is broken into two categories: copper ore and refined copper. The Canal is a major conduit for refined copper (about 40 percent of world trade) and somewhat less significant for copper concentrates (about 15 percent of global trade). The WCSA is practically the only origin region that supplies Canal-relevant copper ore and refined copper, accounting for 98 percent of the refined copper transiting the Canal and 91 percent of copper ore, primarily moving to Europe and the ECUS.

A former world copper production surplus was reversed in 2003, and global inventories declined by about 300,000 tons. The increasing relocation of consumer equipment manufacture to Asia has resulted in important changes to copper trade flows around the world. The growth markets for copper are China, Japan, and other Asian economies. It is expected that Asia will account for nearly 47 percent of copper consumption in the next

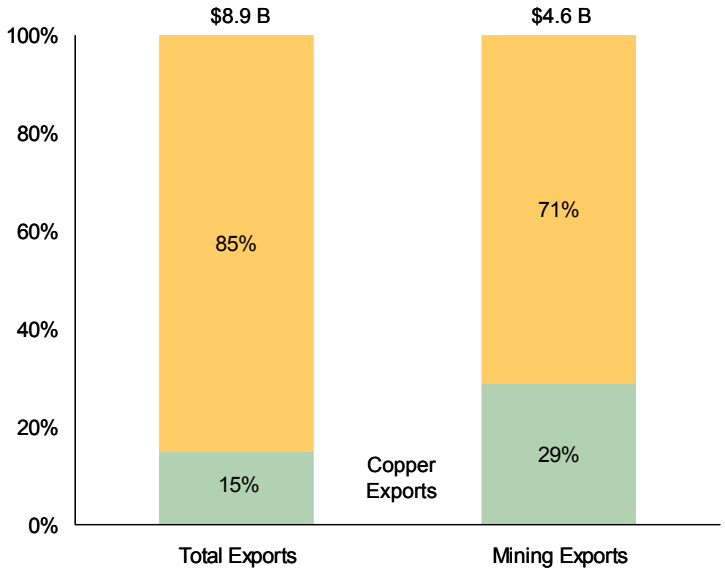
25 years, with West Coast South America expected to fulfill most future increases in global copper demand.

Copper ores and metals account for 29 percent of mining exports and 15 percent of Peru's total exports by value (Exhibit 4-16). China is the main destination for Peruvian copper ores. Refined copper trade between the US and WCSA is also expected to double during the next 25 years. Since trade to Asia will not transit the Panama Canal, the relevant issue for the Canal is primarily European demand.

Exhibit 4-16

Peru's Copper Exports: 2002

(percentage of US$)



Source: UN COMTRADE, Central Bank of Peru.

4.3.7 Containerized Cargo

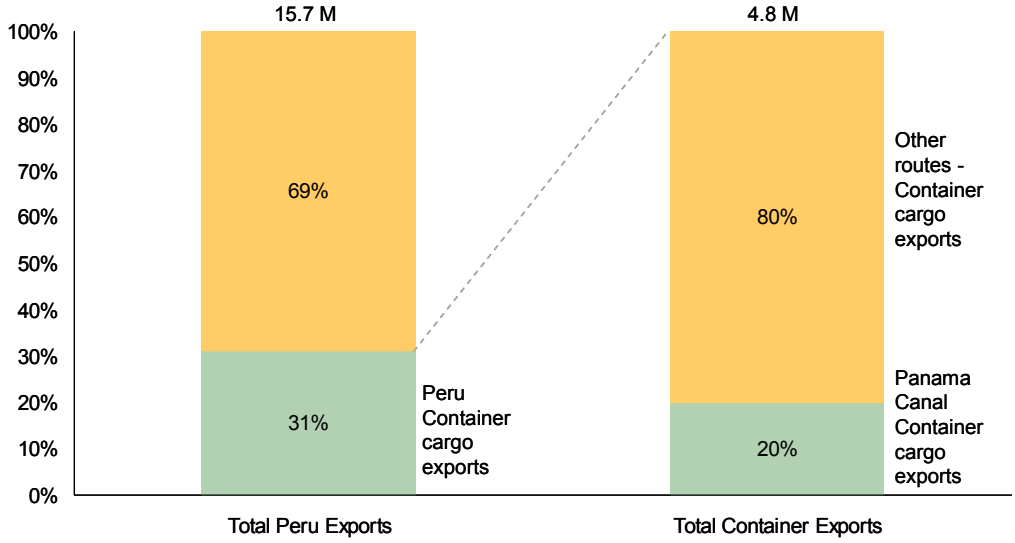
In 2002, approximately 30 percent of total tonnage exported from Peru moved in containers, and approximately 20 percent of Peru's exported container cargo transited the Panama Canal (Exhibit 4-17). Thus containerized cargo made up 6 percent of total Peruvian export tons in 2002.

The main trade lanes relevant to the Canal for Peru's exported containerized cargo are Europe, ECUS, ECSA, East Coast Central America (ECCA), and the West Indies. The main commodities exported by Peru in containers are edible vegetables such as onions, coffee, fruit (mainly bananas, dates, figs, pineapple, etc.), shellfish, wood products (mainly lumber), refined copper, and prepared vegetables. Key containerized cargo exports discussed in this section are shown in Exhibit 4-18.

Exhibit 4-17

Peru's Container Exports and the Panama Canal, 2002

(percentage of tons)

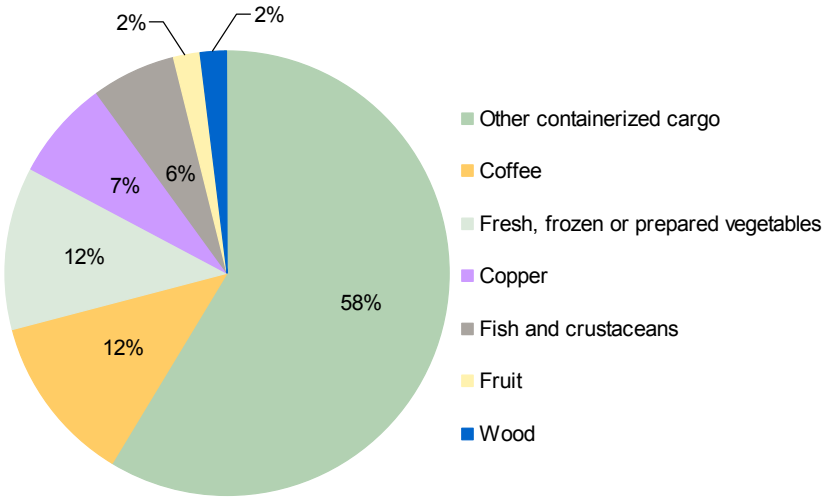


Source: Plan Nacional de Desarrollo Portuario, ACP.

Exhibit 4-18

Peru's Containerized Cargo Exports by Commodity: 2002

(percent of tons)



Source: ACP, US Waterborne, Eurostat, Mercer analysis.

Coffee

Coffee is one of Peru's most important export commodities, accounting for 2 percent of total export tons in 2003. However, Peru is not one of the top coffee exporters in the world, and only accounts for around 2 percent of the world's exports.

In 2003, Peru exported around 120,000 tons of coffee through the Panama Canal, which is equivalent to 12 percent of the exported containerized cargo tonnage transiting the Canal from Peru. On the other hand, Peru exported around 190,000 tons of coffee by sea, thus approximately 60 percent of Peru's coffee sea exports transit the Panama Canal.

Fresh, Frozen, and Prepared Vegetables

Vegetable products are transported in containers as fresh or frozen vegetables or as vegetable preparations. Vegetable exports account for 3.5 percent of Peru's total export tons. This commodity category includes vegetables such as onions, tomatoes, potatoes, lettuce and carrots. In 2002, Peru exported US$ 306 million worth of vegetables by seaborne transport. In value terms, the most relevant exported vegetable for Peru in 2002 was asparagus (in different forms). In total, vegetables account for 12 percent of the exported containerized cargo tonnage transiting the Canal from Peru.

Copper

Refer to section 4.3.6 for bulk copper discussion. Copper is also transported in containers; in 2003 containerized copper accounted for 7 percent of exported containerized cargo tonnage transiting the Canal from Peru.

Fish and Crustaceans

Shellfish are also an important containerized export commodity for Peru, and in 2003, accounted for 1 percent of Peru's total exports; Peru's shellfish exports only account for 0.3 percent of world exports, however. In 2003, shellfish accounted for 6 percent of Peru's Canal-relevant containerized cargo exports in tons.

Fruit

Fruit exported from Peru is transported as bulk or containerized cargo. In total, Peru's fruit exports accounted for 1 percent of its total exports in 2003 and 0.3 percent of world fruit exports. Containerized fruit accounted for 2 percent of Peru's total Canal-relevant containerized cargo exports in tons.

Wood

Wood exports from Peru are transported as bulk or containerized cargo. In total, Peru's wood exports accounted for 1 percent of Peru's total exports in 2003 and 0.2 percent of world exports of this commodity. Containerized wood through the Canal accounted for 1.9 percent of Peru's total Canal-relevant containerized cargo in tons.

4.4 Canal-Relevant Peruvian Import Commodities

Peru imports a diverse range of products, from raw materials and fuels such as coal, to finished goods such as machinery. Containerized cargo is very relevant; however the merchandise mix is very fragmented and cannot be exhaustively described. In this section the main bulk imported products are described.

4.4.1 Grain

Corn

Corn is primarily used to feed livestock, but is also a major source of food products for human consumption. It is into many types of food and industrial products, including starches, sweeteners, corn oil, beverage and industrial alcohol, and fuel ethanol.
The United States is not only the world's top corn producer, but also the top exporter. In 2003 (October-September), the United States exported 53 percent of world corn exports by weight. Corn transiting the Canal to Peru is primarily from the United States and the Russian Federation.

Wheat

Like corn and soybeans, wheat is a staple grain that is processed to make many end-consumer foodstuffs. The United States is the world's largest exporter of wheat, followed by Canada, France, Australia, and Argentina. Wheat transiting the Canal bound for Peru is mainly imported from the US (76 percent) and the Russian Federation (11 percent).

Soybeans

Soybeans make up a significant portion of the world's food supply. Soybeans are converted into a large variety of food and food-related products such as oil, crackers, vegetarian burgers, non-dairy cheese and milk, bread/flour, etc. The United States is the world's largest exporter of soybeans, with 45 percent of the world's total soybean exports. Soybeans transiting the Canal bound for Peru are mainly sourced from the US.

4.4.2 Fertilizers

Fertilizers are key components of agricultural production, enhancing the ability of existing land and soil resources to increase food production. The most common fertilizers are: nitrogen, phosphorus, potassium, calcium, sulfur, and magnesium.

The United States is the world's largest exporter of fertilizer products by value, followed by the Russian Federation, Canada and Germany. Fertilizers transiting the Canal to Peru are sourced from the US, with 31 percent share, and the Russian Federation, with a 42 percent share.

4.4.3 Petroleum Products

Crude petroleum and petroleum products are by far the most important import commodities for Peru. Peru petroleum products imports include mainly crude petroleum, diesel oil, gasoline, and liquefied gas. In 2003, Peru imported US$1.3 billion in crude petroleum products.

Canal relevant crude petroleum is sourced mainly from Colombia (57 percent) and Venezuela (24 percent), while diesel oil, gasoline and liquefied gas imports are mostly from Venezuela.

The new Camisea natural gas project will provide a substitute energy source for Peru, taking share from oil products imports, especially diesel and natural gas.

4.4.4 Iron and Steel

World steel production was 970 million tons in 2003, and according to the International Iron and Steel Institute is expected to reach 1 billion tons at the end of 2004. For the first time in 20 years, there is worldwide growth in demand for steel, which is expected to lead to tightening of supplies and higher prices mainly due to large infrastructure investments (e.g. housing, reconstruction) in countries or regions like the US, Europe, India or Russia.

Peru mainly imports iron and steel plates, sheets, and coils through the Panama Canal. In 2003, the most relevant trade lanes for these imports were the East Coast of South America (60 percent) and Europe (40 percent).

4.4.5 Coal

Coal is the one of the most important commodities imported by Peru by weight; 7 percent of Peru's Canal-relevant imports are coal. Canal-relevant coal destined for Peru is primarily imported from Colombia and Venezuela.

5

Canal-Relevant Commodities Analysis

5.1 Methodology for Export Commodities Analysis

This section provides the results of an analysis of the Peru Canal-relevant commodities discussed in section 4. These commodities were analyzed with the objective of determining the potential impact of an increase in the Canal toll on landed cost, and therefore the relevance of a toll increase to Peru trade and the Peru economy.

The methodology for analysis was threefold:

1. The relevance of Panama Canal tonnage transits for 1999-2003 to the overall trade in the commodity for Peru was determined. Where possible, commodities were matched to the ACP's description of each category and HS 4-digits or HS2-digits.

2. If the commodity tonnage transits through the Canal were above a certain threshold (percent of country trade) then the commodity was analyzed further to determine the relevance of a potential increase in Canal toll on landed cost. (For Peru exports, freight and insurance charges were determined by calculating these charges for Peru imports of the same commodity that travel via Canal-relevant routes.)

3. A sensitivity analysis was then applied to determine a range of impact on landed cost given different toll increase scenarios.

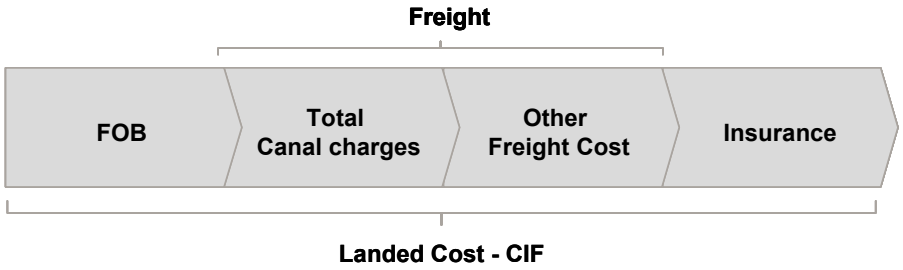
This methodology may have been slightly modified depending on the particular commodity analyzed (and if so, that information is noted below).

In most cases, the first step involved two analyses to determine the significance of a particular commodity's Panama Canal transits with respect to Peru trade:

- Total value of the exports of a specific commodity compared to total Peru exports
- Total value of the specific commodity transiting the Canal compared to the value of Peru's total exports of that commodity

ACP transit data was used to determine Panama Canal transits for each commodity. If the commodity tonnage transits through the Canal were above a certain threshold (percent of country trade or exports through the Canal), the next step involved first determining what percentage of total landed cost is represented by the Panama Canal transit costs (toll plus other marine services). For the purposes of this analysis, landed cost was unbundled as shown in Exhibit 5-1.

Exhibit 5-1
Components of Landed Cost



To determine total landed cost (CIF) for each exported commodity, the FOB, tonnage, and freight and insurance charges were obtained from several sources, depending on the type of commodity (bulk or containerized commodities). All costs are average values of all sea trade exports.

- Bulk commodities: Mercer used a benchmark value obtained through the UN COMTRADE statistics database data. Using 2002 data, the FOB/ton, insurance/ton, freight charge/ton and CIF/ton values were obtained, and these ratios were then used to convert the tonnage transiting the Canal into dollar values.

- Containerized commodities:

  – Mercer used a benchmark value obtained through the US Waterborne Commerce 2003 database for US imports from Peru to estimate the FOB, freight and insurance and CIF values.

  – The commodities to be analyzed were obtained using 2003 US Waterborne Commerce data. Those commodities accounting for around 70 percent of containerized cargo to an HS2 level were selected, which included edible vegetables (HS2 code 07), coffee (HS2 code 09), fruit (HS2 code 08), fish and crustaceans (HS2 code 03), wood (HS2 code 44), copper (HS2 code 74) and preparations of vegetables and fruits (HS2 code 20).

- Given that Europe is one of the most relevant markets for containerized Peruvian cargo, the selected commodities were backed-up by obtaining the relevant Peruvian export commodities at the HS2 level using Eurostat data for 2003. In the case of Peru, the pre-selected US Waterborne Commerce containerized commodities matched the relevant commodities imported by the European Union.

- The US and EU imported tonnage for the relevant containerized commodities was added and in the end 42 percent of 2003 Canal-relevant containerized Peruvian exports were accounted for.

When a commodity is analyzed as bulk cargo and this commodity is also exported in containers, the analysis for the containerized commodities is carried out separately but included in the same section where the bulk commodity is analyzed (e.g., copper).

The average Canal toll per ton for each commodity was calculated using ACP data from ships fully laden with that commodity.

A total CIF per ton was then calculated, and compared to the total Canal charges (toll plus other marine services) per ton for that commodity to determine the percentage share accounted for by the Canal transit cost out of the total landed cost, i.e.:

Total Canal Charges[3] */ (FOB+Canal Charges+Freight+Insurance) = Total Canal Charges as % of CIF*

For the purposes of this study, the toll charges were obtained directly from ACP for ship transits for vessels containing only one type of analyzed commodity, and thus a more accurate toll/ton value was obtained. Other marine services (OMS) charges were calculated as a percentage of total Canal charges; on average, OMS is around 22 percent of total Canal charges, but the more accurate value is used for each analyzed commodity.

In the final step, a sensitivity analysis was applied to determine the potential increase in CIF for potential toll increase scenarios, including toll increases of 50, 100, 150, and 200 percent. OMS charges were maintained constant.

5.2 Zinc

5.2.1 Overview

Zinc ores and zinc metal account for almost 15 percent of mining exports and almost 7 percent of Peru's total exports. For 2000-2003, an average of 77 percent of Peru's total zinc export tonnage (including zinc ore and zinc metal) transited the Canal (Exhibit 5-2).

[3] *Total Canal Charges = Toll Charges + Other Marine Services Charges (OMS)*

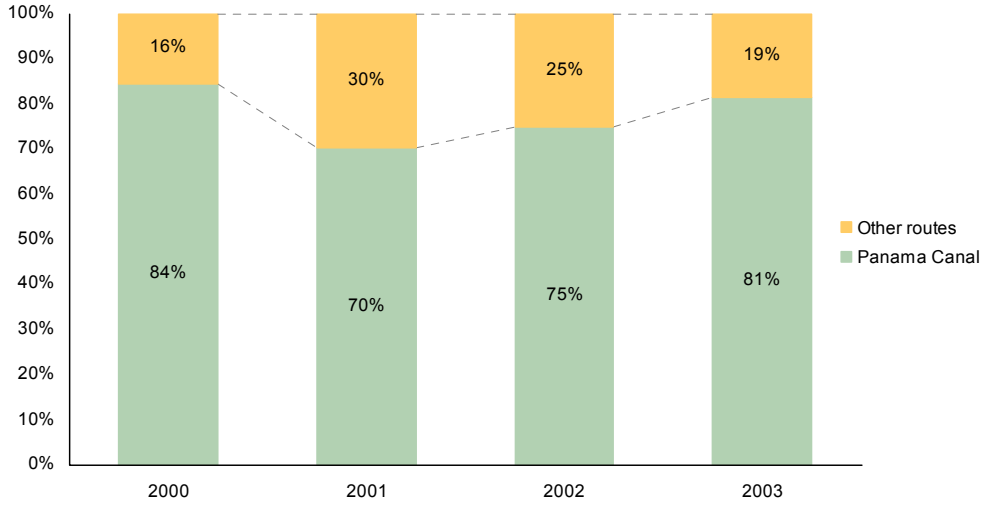
As described above, two analyses were carried out to determine the significance of Panama Canal zinc transits with respect to Peru's trade: total value of zinc exports was compared to total Peru exports, and the total value of zinc transiting the Canal was compared to the value of Peru total zinc exports.

These analyses determined that the value of Peru's total zinc exports (ore and metal) in 2003 was $600 million (Exhibit 5-3). Of this, 52 percent transited the Panama Canal, or 3.6 percent of Peru's total exports.

Exhibit 5-2

Canal Transit Share of Peru's Zinc Exports: 2000-2003

(percentage of tons)

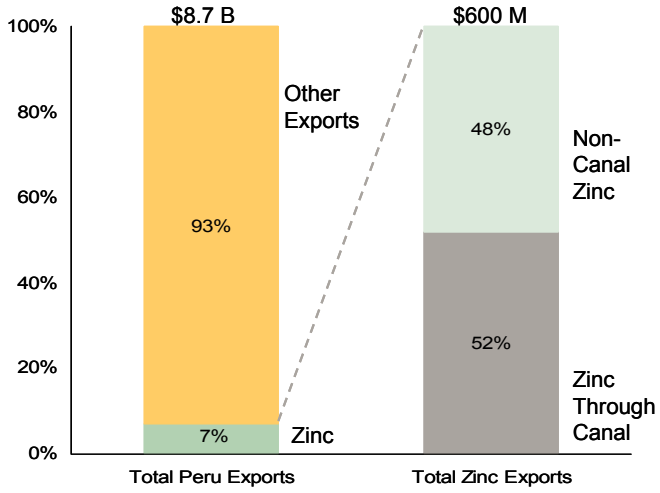


Source: Central Bank of Peru, ACP database and Mercer analysis.

Exhibit 5-3

Canal Transit Share of Total Zinc Exports: 2003

(percentage of US$)



Source: UN COMTRADE, ACP data.

5.2.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-4 shows the cost components of the calculated CIF for zinc exports. Using the methodology described in section 5.1, the analysis found that that the Canal transit cost represents 1.0 percent of the total landed cost for zinc ore and 0.3 percent for zinc metal.

Exhibit 5-4
Canal Cost Share of Peru Exported Zinc CIF (Landed Cost)
(2003 values in US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Zinc metal	$840	$31.4	$2.2	$874	0.3%
Zinc ore	$217	$37.7	$2.4	$257	1.0%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting zinc through the Canal would have a low impact on the commodity's total landed cost.

A sensitivity analysis further showed that zinc exports would not be affected in a significant way by Panama Canal toll changes (Exhibits 5-5 and 5-6). Even with a 200 percent toll increase, the CIF price for zinc metal would increase by a maximum of 0.38 percent, equivalent to US$ 3.3 per ton, while the CIF price of zinc ore would increase by 1.44 percent, equivalent to US$3.7 per ton.

Exhibit 5-5
Sensitivity Analysis of Peru Zinc Metal CIF

Toll increase	50%	100%	150%	200%
Zinc metal CIF price impact	0.09%	0.19%	0.28%	0.38%
Zinc metal new CIF price	US$ 874.6	US$ 875.4	US$ 876.2	US$ 877.1

Source: Mercer analysis.

Exhibit 5-6
Sensitivity Analysis of Peru Zinc Ore CIF

Toll increase	50%	100%	150%	200%
Zinc ore CIF price impact	0.36%	0.72%	1.08%	1.44%

Zinc ore new CIF price	US$ 257.7	US$ 258.7	US$ 259.6	US$ 260.5

Source: Mercer analysis.

5.2.3 Analysis of Commodity Relevance

Peru is a major zinc exporter, and there are few alternative sources for zinc. Thus an increase in Canal toll would not affect the competitive landscape. Additionally, zinc transiting the Canal represents only 3.6 percent of Peru's exports. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade and economy nor on the industry's role in the Peruvian economy.

5.3 Copper

5.3.1 Overview

Copper ores and metals account for 29 percent of mining exports, and 15 percent of Peru's total exports by value. The Canal is a major conduit for refined copper, with approximately 40 percent of world trade passing through the Canal, and somewhat less significant for copper concentrates, with 15 percent transiting the Canal.

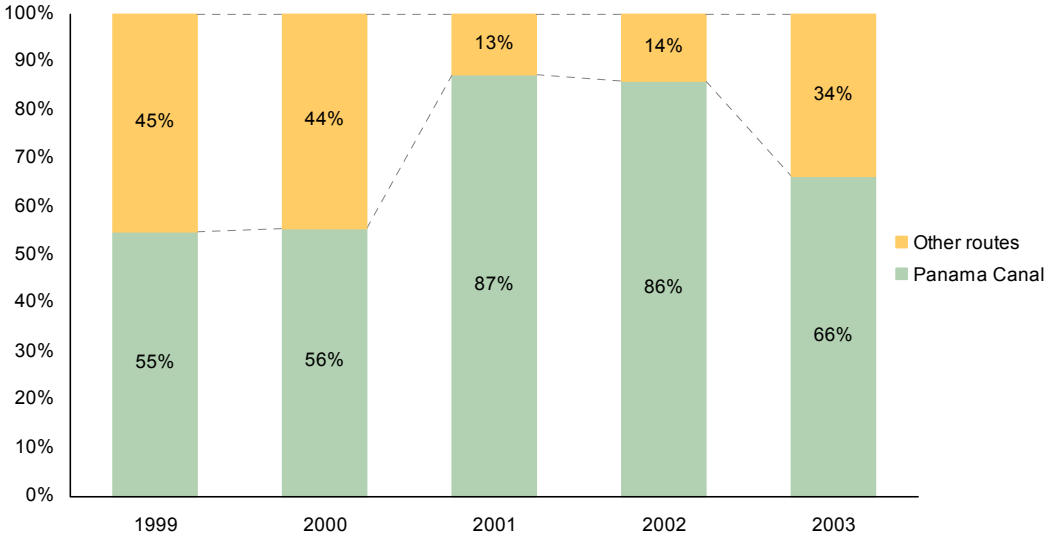
From 2000 to 2003, an average of 70 percent of Peru's total copper export tonnage (including copper ore and copper metal) transited the Canal. The copper trade through the Canal is mainly categorized as copper metal and copper ore; however refined copper is also a relevant containerized commodity (Exhibit 5-7).

The value of Peru's total copper exports (ore and metal) in 2003 was $1.3 billion dollars. Of this, 34 percent transited the Panama Canal as bulk and 15 percent as containerized cargo (representing 5.1 percent and 2.3 percent of total Peruvian exports, respectively) (Exhibit 5-8).

Exhibit 5-7

Panama Canal Transit Share of Peru's Copper Exports: 1999-2003

(percentage of tons)

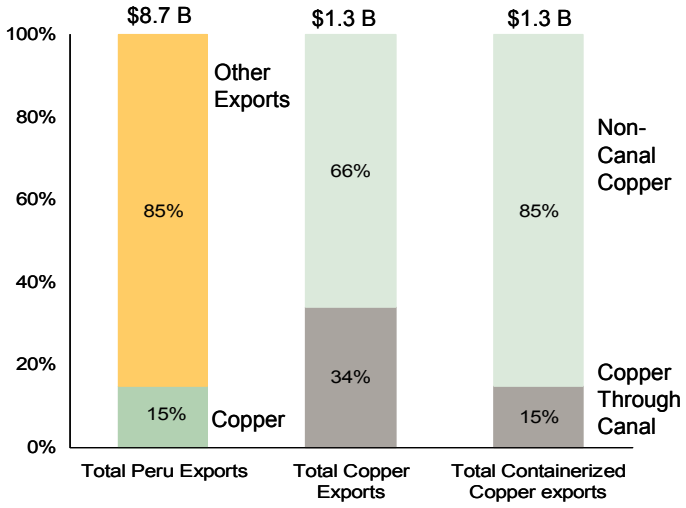


Source: Central Bank of Peru, ACP database, Mercer analysis.

Exhibit 5-8

Canal Transit Share of Total Copper Exports: 2003

(percentage of US$)



Source: UN COMTRADE, ACP data.

5.3.2 Panama Canal Cost Share of Landed Cost

In section 5.1 the methodology for commodities analysis was described, however, given that Peru's copper can be transported as bulk or in containers, Canal cost relevance to landed cost was developed as follows:

- For bulk copper, UN COMTRADE data for copper exports was used, both for FOB and CIF per ton values.

- For containerized copper 2003 US Waterborne Commerce data for Peruvian containerized copper was used and an average for all containerized copper metals was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 6.9 tons/TEU;[4] the canal charges per TEU are valued at $40.6 dollars and Canal toll at $30.5 dollars.

Exhibit 5-9 shows the cost components of the calculated CIF for Peru copper exports. Total Canal transit costs represent 0.1 percent of Peru copper metal CIF; 0.5 percent of Canal copper ore CIF, and 0.4 percent of containerized copper CIF.

Exhibit 5-9
Canal Transit Cost Share of Peru Exported Copper CIF (Landed Cost)
(2003 values in US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Copper metal	$1,727	$37.6	$2.6	$1,751	0.1%
Copper ore	$403	$90.9	$2.5	$482	0.5%
Containerized Copper ($/TEU)	$13,603	$466	$40.6	$14,171	0.4%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting copper through the Canal would have a low impact on the commodity's total landed cost.

A sensitivity analysis further showed that copper ore, copper metal, and containerized copper exports would be minimally affected by Panama Canal toll changes (Exhibit 5-10). Even if the Canal toll were increased by 200 percent, the CIF price for copper metal would increase by a maximum 0.22 percent, is equivalent to US$ 3.9 per ton; the CIF price of copper ore would increase by 0.76 percent, equivalent to US$3.7 per ton; and the CIF price for containerized copper metal would increase by a maximum of 0.43 percent, equivalent to US$ 45.8 per ton.

[4] ACP 2004 Demand Forecast Model.

Exhibit 5-10
Sensitivity Analysis of Peru Copper CIF

Toll increase	50%	100%	150%	200%
Copper metal CIF price impact	0.06%	0.11%	0.17%	0.22%
Copper metal new CIF price	US$ 1,767.7	US$1,768.7	US$1,769.7	US$ 1,770.7
Copper ore CIF price impact	0.19%	0.38%	0.57%	0.76%
Copper ore new CIF price	US$ 497.5	US$ 498.4	US$ 499.3	US$ 500.3
Containerized copper CIF price impact	0.11%	0.22%	0.32%	0.43%
Containerized copper new CIF price ($/TEU)	US$14,186	US$14,201	US$14,216	US$14,232

Source: Mercer analysis.

5.3.3 Analysis of Commodity Relevance

The growth markets for copper are China and other Asian economies, but they are all but irrelevant for the Canal. Trade to Asia from the major supply sources in Chile and Peru does not transit the Canal nor will it reduce exports to North America and Europe, as South American mines are expected to be able to meet demand increases through the forecast period. Therefore, the relevant issue for the Canal is primarily European demand and, secondarily, US demand.

European demand for copper is expected to show steady growth, and the trade would appear to be relatively insensitive to tolls, due to a lack of product or source substitutes and copper's high value; however, the trade is sensitive on the basis of the alternate route from Peru to Europe via Cape Horn. Furthermore, the US is not expected to be able to satisfy its internal copper demand with own production, so trade into that region is also expected to remain stable.

Given copper's very high price in dollars per ton, even a 200 percent increase in the Canal toll would not materially affect the CIF of copper.. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade and economy nor on the industry's role in the Peruvian economy.

5.4 Fishmeal

5.4.1 Overview

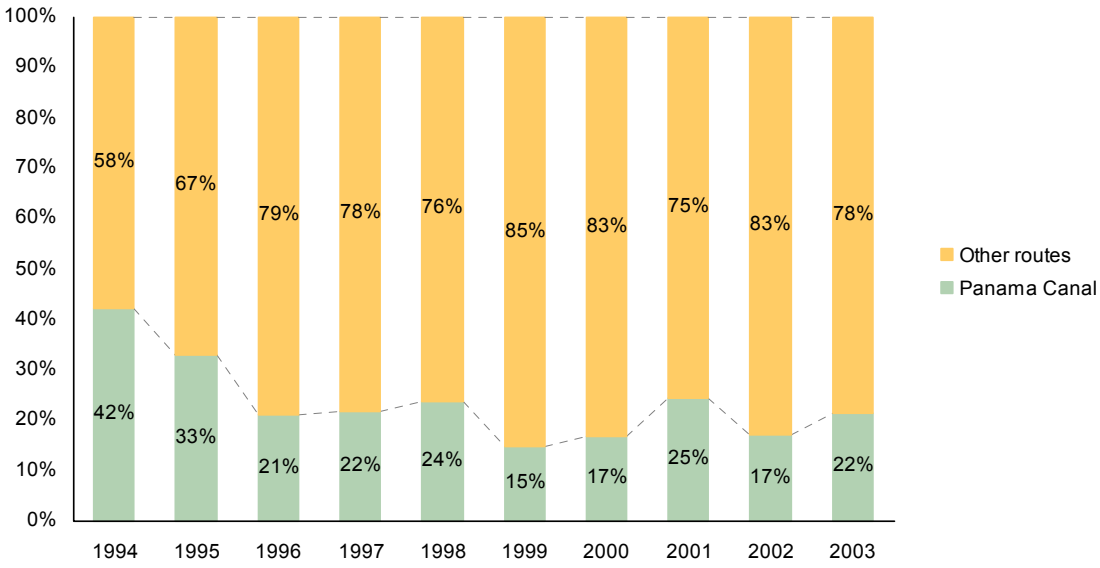
Fishmeal accounts for 72 percent of fishing products exports and almost 8 percent of Peru's total exports by value. Between 1994 and 2003, the share of Peru's total fishmeal exports transiting the Canal decreased from more than 40 percent in 1994 to a little more than 20 percent in 2003. This downward trend will continue as demand shifts from the EU towards Asia (Exhibit 5-11).

The value of Peru's total fishmeal in 2003 was $742 million, which represented 8.5 percent of Peru's total exports (Exhibit 5-12). Of this, 21 percent transited the Panama Canal, or 1.8 percent of total Peruvian exports.

Exhibit 5-11

Canal Transit Share of Peru's Fishmeal Exports: 1994-2003

(percentage of tons)

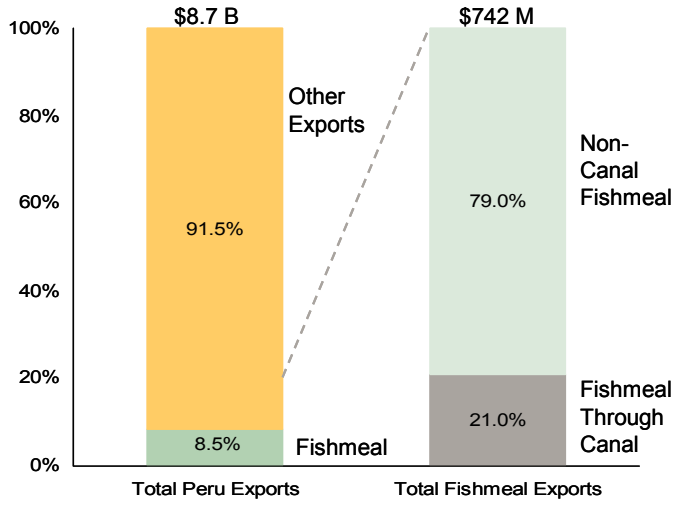


Source: Central Bank of Peru, ACP database, Mercer analysis.

Exhibit 5-12

Canal Transit Share of Total Fishmeal Exports: 2003

(percentage of US$)



Source: UN COMTRADE, ACP data.

5.4.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-13 shows the cost components of the calculated CIF for fishmeal exports. Using the methodology described in section 5.1, the analysis found that that the Canal transit cost represents 0.5 percent of the total landed cost for fishmeal.

Exhibit 5-13

Canal Transit Cost Share of Peru Exported Fishmeal CIF (Landed Cost)

(2003 values in $US/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Fishmeal	541	57.1	2.9	601	0.5

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting Fishmeal through the Canal would have a low impact on the commodity's total landed cost.

A sensitivity analysis further showed that fishmeal exports would be moderately affected by Panama Canal toll changes (Exhibit 5-14).If the Canal toll was increased by a maximum of 200 percent, the CIF price for fishmeal would increase by 0.73 percent, is equivalent to US$ 4.3 per ton.

Exhibit 5-14
Sensitivity Analysis of Peru Fishmeal CIF

Toll increase	50%	100%	150%	200%
Fishmeal CIF price impact	0.18%	0.36%	0.55%	0.73%
Fishmeal new CIF price	US$ 602.1	US$603.1	US$604.2	US$ 605.3

Source: Mercer analysis.

5.4.3 Analysis of Commodity Relevance

Peru is a world dominant producer and exporter of fishmeal. The Canal cost represents only 0.73 percent of fishmeal's CIF, thus an increase in the Canal toll would not materially affect the landed cost nor the competitive landscape. Furthermore, Peru fishmeal exports transiting the Panama Canal represent only 1.8 percent of Peru's exports. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade and economy nor on the industry's role in the Peruvian economy.

5.5 Salt Analysis

5.5.1 Overview

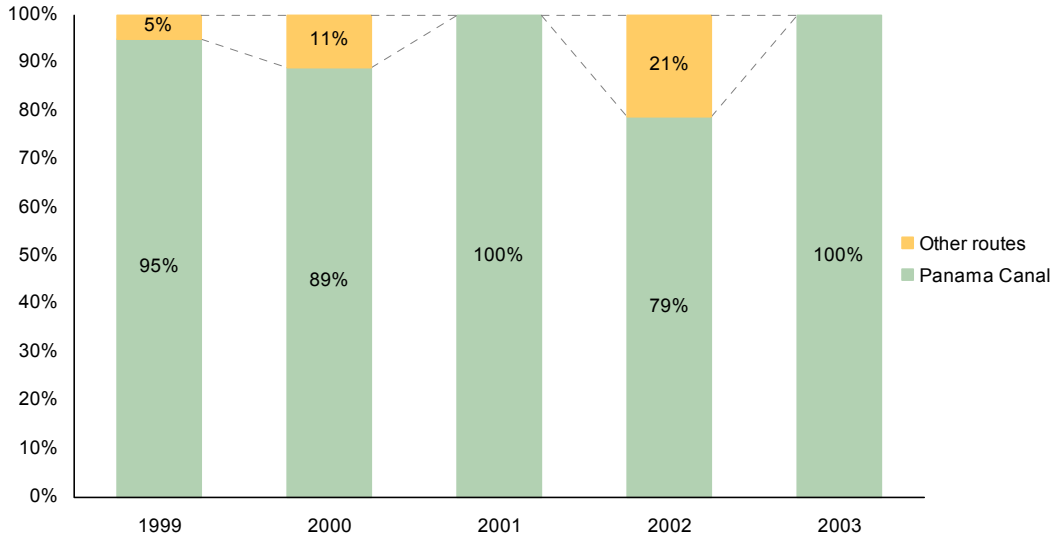
In 2003, 100 percent of Peru's salt export tons transited the Canal, bound for the ECUS (Exhibit 5-15).

The value of Peru's salt transiting the Canal in 2003 was $3.4 million, representing 0.04 percent of Peru's total exports (Exhibit 5-16).

Exhibit 5-15

Canal Transit Share of Peru's Salt Exports: 1999-2003

(percentage of tons)

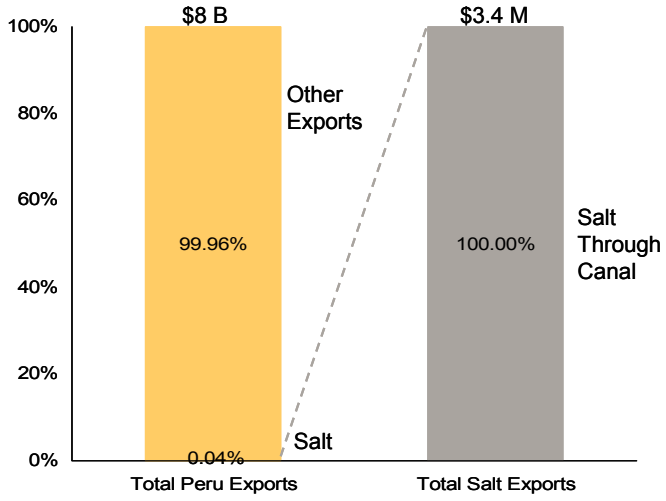


Source: Central Bank of Peru, ACP database, Mercer analysis.

Exhibit 5-16

Canal Transit Share of Total Salt Exports: 2003

(percentage of US$)



Source: UN COMTRADE, ACP data.

5.5.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-17 shows the cost components of the calculated CIF for salt exports. Using the methodology described in section 5.1, the analysis found that that the Canal transit cost represents 8.3 percent of the total landed cost for salt.

Exhibit 5-17
Canal Transit Cost Share of Salt CIF (Landed Cost)
(2003 values in US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Salt	8	13.9	2.0	24	8.3

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting salt through the Canal would have a high impact on the commodity's total landed cost.

A sensitivity analysis further showed that salt exports would be highly affected by Panama Canal toll changes (Exhibit 5-18). If the Canal toll were increased by a maximum of 200 percent, the CIF price for salt would increase by 12.9 percent, equivalent to US$3.1 per ton.

Exhibit 5-18
Sensitivity Analysis of Peru Salt CIF

Toll increase	50%	100%	150%	200%
Salt CIF price impact	3.23%	6.4%	9.7%	12.9%
Salt new CIF price	US$ 25.1	US$25.8	US$26.6	US$27.4

Source: Mercer analysis.

5.5.3 Analysis of Commodity Relevance

The East Coast US is the main destination for salt transiting the Canal from Peru. Salt imports as a share of US highway salt sales have demonstrated a moderately strong negative correlation to time charter rates of -62 percent. This correlation is indicative of a high sensitivity to shipping costs. And, practically, the availability of domestic salt and numerous additional sources on the Atlantic side of the Canal provide easy sources that can displace Peruvian salt imports.

Salt imports to the five key US Northeastern ports had an average customs value of $12.09/long ton in 2001 and 2002, compared to $19.88/long ton for rock salt at the mine mouth.[5] Therefore, reducing the difference by $8/ton would eliminate imports. Any toll increase would affect import volumes through the Canal in proportion to the $8 per ton margin.

[5] U.S. Census Bureau, 2002, US Geological Survey Minerals Yearbook, 2002.

The sensitivity analysis determined that a 200 percent increase in Canal tolls would increase the CIF price per ton by US$3.1 per ton. According to our analysis of salt market dynamics and the most probable demand scenarios, only when the price per ton is increased by US$8 would US imports be affected. Therefore, a 200 percent increase in Canal tolls would not substantially affect demand from the US.

Salt exports also represent a very small proportion of Peru's total exports (0.04 percent) and thus Peru's trade and the economy are not expected to be impacted by a Canal cost increase for salt exports.

5.6 Crude Oil

5.6.1 Overview

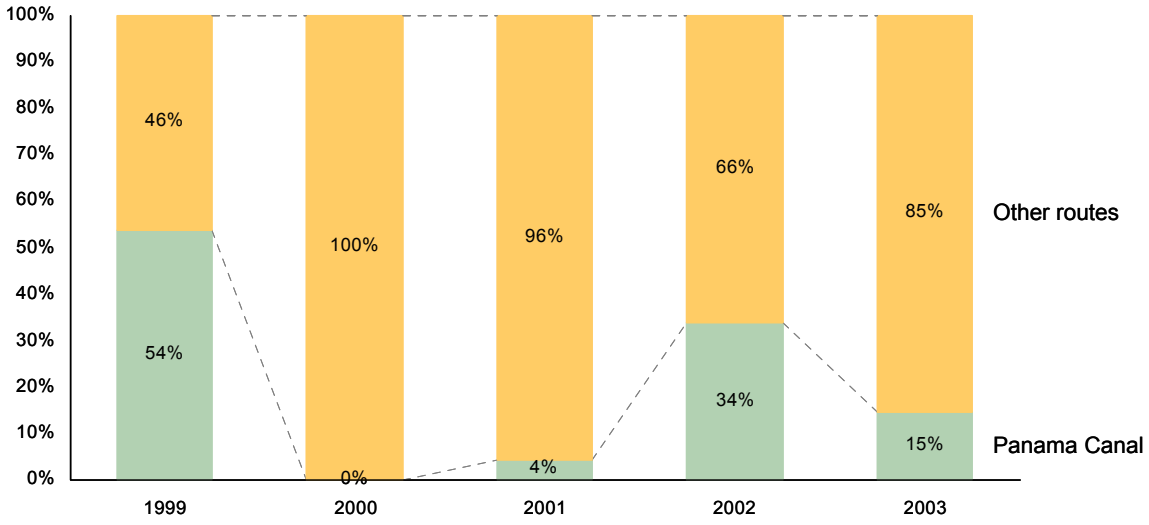
Between 1999 and 2003, Peru crude oil exports fluctuated significantly, but overall increased by 3 percent. Over the same period, Peru's crude oil tons transiting the Canal decreased by 72 percent in total, with a high variation year to year. For example, according to ACP data, in 2000, none of Peru's crude oil exports transited the Canal. (Exhibit 5-19).

The value of Peru's total crude oil exports in 2003 was $266 million. Crude oil exports transiting the Canal represent 16 percent of total crude oil exports by value, or 0.5 percent of Peru's total exports (Exhibit 5-20).

Exhibit 5-19

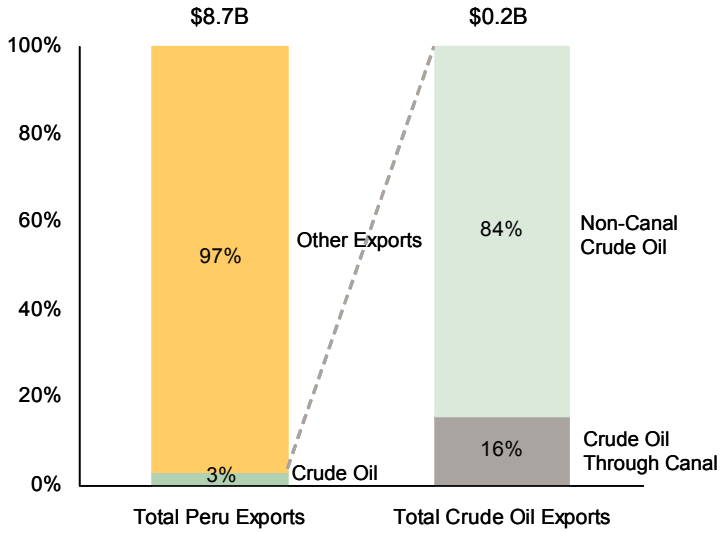
Canal Transit Share of Peru's Crude Oil Exports: 1999-2003

(percentage of tons)



Source: Mercer analysis, UN Comtrade, ACP database

Exhibit 5-20
Canal Transit Share of Total Crude Oil Exports: 2003
(percentage of US$)



Source: Mercer analysis, UN Comtrade, ACP data.

5.6.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-21 shows the cost components of the calculated CIF for Peru crude oil exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represents 1 percent of the CIF of this commodity.

Exhibit 5-21
Canal Transit Cost Share of Peru Exported Crude Oil CIF (Landed Cost)
(2003 values in US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Crude Oil	$170	$51	$2.30	$224	1%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting oil through the Canal would have a very low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that if the Canal toll were increased by 200 percent, the CIF price for crude oil would increase by 1.6 percent, which is equivalent to US$ 3.9 per ton (Exhibit 5-22).

Exhibit 5-22
Sensitivity Analysis of Peruvian Crude Oil CIF

Toll increase	50%	100%	150%	200%
Crude oil CIF price impact	0.4%	0.8%	1.2%	1.6%
Crude oil new CIF price	US$ 224	US$ 225	US$ 226	US$ 227

Source: Mercer analysis.

5.6.3 Analysis of Commodity Relevance

A maximum 200 percent increase in Canal tolls would have a low impact on the CIF price for Peru's crude oil, and demand would not likely be affected. Additionally, Peru's crude oil exports transiting the Canal are only 0.5 percent of Peru's total exports. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.7 Gasoline

5.7.1 Overview

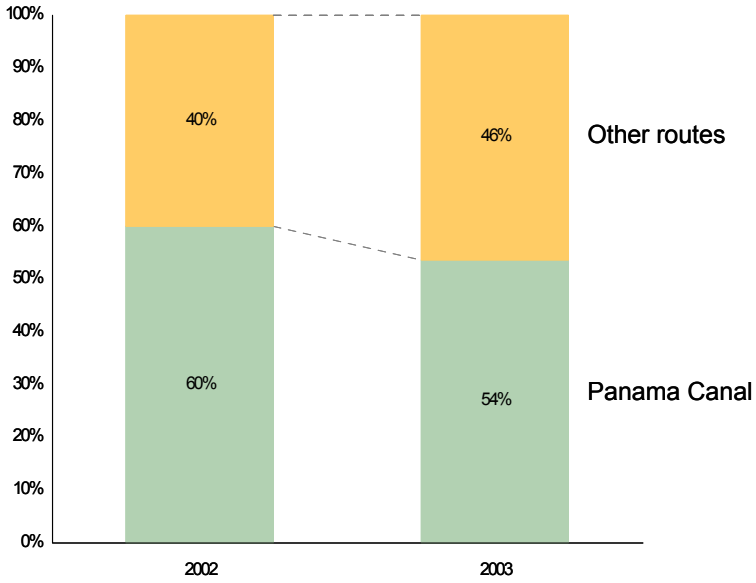
In 2003, approximately 54 percent of exported gasoline tons transited the Canal (Exhibit 5-23). Peru's gasoline exports decreased by 37 percent between 2002 and 2003. During the same period, Peruvian gasoline transiting the Canal decreased by 44 percent

The value of Peru's total gasoline exports in 2003 was $76 million, which represented 0.9 percent of Peru's total exports (Exhibit 5-24). Gasoline exports transiting the Canal represent 47 percent of total gasoline exports by value, or 0.4 percent of Peru's total exports (Exhibit 5-24).

Exhibit 5-23

Canal Transit Share of Total Gasoline Exports: 2002-2003

(percentage of tons)

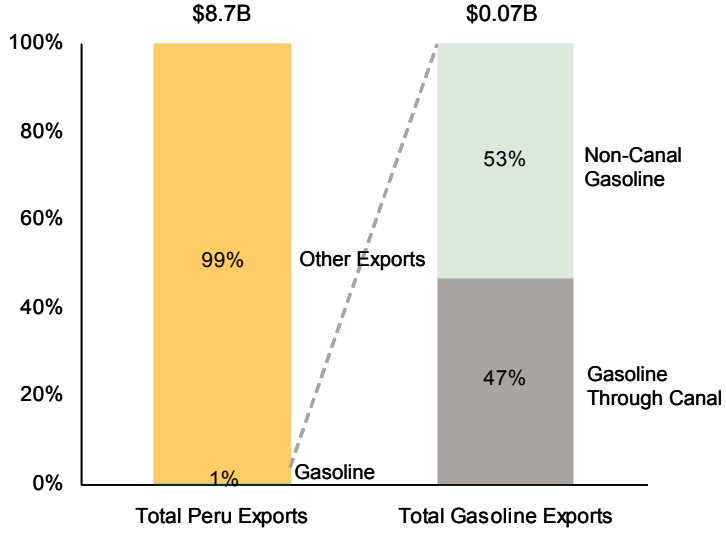


Source: Mercer analysis, UN Comtrade, ACP database

Exhibit 5-24

Canal Transit Share of Total Gasoline Exports: 2003

(percentage of US$)



Source: Mercer analysis, UN Comtrade, ACP data.

5.7.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-25 shows the cost components of the calculated CIF for Peru gasoline exports. Using the methodology described in section 5.1, the analysis found that total Canal charges represents 1.2 percent of Peruvian gasoline CIF.

Exhibit 5-25
Canal Cost Share of Peru Exported Gasoline CIF (Landed Cost)
(2003 values in US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Gasoline	$224	$12	$2.80	$239	1.2%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting gasoline through the Canal would have a very low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that if the Canal toll increased by 200 percent, the CIF price for crude oil would increase by 1.8 percent, equivalent to US$ 4.40 per ton (Exhibit 5-26).

Exhibit 5-26
Sensitivity Analysis of Peruvian Gasoline CIF

Toll increase	50%	100%	150%	200%
Gasoline CIF price impact	0.5%	0.9%	1.4%	1.8%
Gasoline new CIF price	US$ 240	US$ 241	US$ 242	US$ 243

Source: Mercer analysis.

5.7.3 Analysis of Commodity Relevance

Although a large portion of Peru's gasoline exports transit the Canal, these exports represent only 0.4 percent of Peru's total exports. Furthermore, a 200 percent increase in the Canal toll would have a low impact on the CIF price, and demand would not likely be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.8 Residual Fuel Oil

5.8.1 Overview

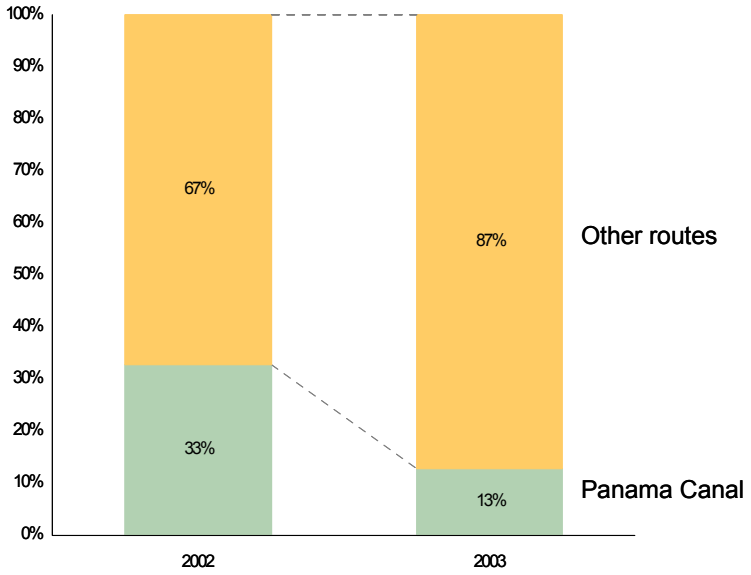
In 2003, approximately 13 percent of Peru's residual fuel oil export tons transited the Canal, primarily bound for the US. Peru's residual fuel oil exports increased by 25 percent between 2002 and 2003; during the same period, Peru's residual fuel oil transiting the Canal decreased by 51 percent mainly due to a large decrease in West Indies demand (Exhibit 5-27).

The value of Peru's total residual fuel oil exports in 2003 was $76 million. Of Peru's residual fuel exports, 15 percent by value transit the Canal, representing 0.6 percent of Peru's total exports (Exhibit 5-28).

Exhibit 5-27

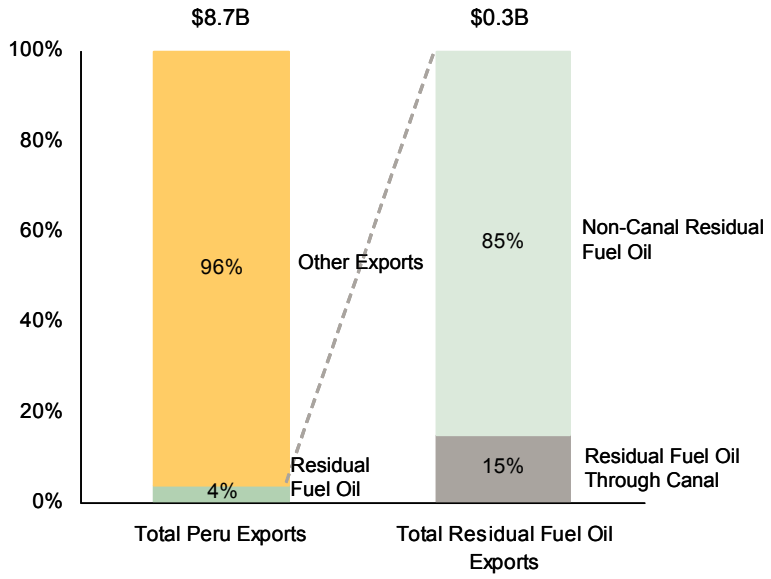
Canal Transit Share of Peru's Residual Fuel Oil Exports: 2002-2003

(percentage of tons)



Source: Mercer analysis, UN Comtrade, ACP database.

Exhibit 5-28
Canal Transit Share of Total Residual Fuel Oil Exports: 2003
(percentage of US$)



Source: Mercer analysis, UN Comtrade, ACP data.

5.8.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-29 shows the cost components of the calculated CIF for Peru residual fuel oil exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represent 1.2 percent of Peruvian residual fuel oil CIF.

Exhibit 5-29
Canal Transit Cost Share of Peru Exported RFO CIF (Landed Cost)
(2003 values in (US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Residual fuel oil	$179	$4	$2.20	$185	1.2%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting RFO through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that if the Canal toll were increased by 200 percent, the CIF price for crude oil would increase by 1.9 percent, equivalent to US$ 3.50 per ton (Exhibit 5-30).

Exhibit 5-30
Sensitivity Analysis of Peruvian Residual Fuel Oil CIF

Toll increase	50%	100%	150%	200%
Residual fuel oil CIF price impact	0.5%	0.9%	1.4%	1.9%
Residual fuel oil new CIF price	US$ 185	US$ 186	US$ 187	US$ 188

Source: Mercer analysis.

5.8.3 Analysis of Commodity Relevance

Peru residual fuel oil exports transiting the Canal represent only 0.6 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.9 Iron Ore

5.9.1 Overview

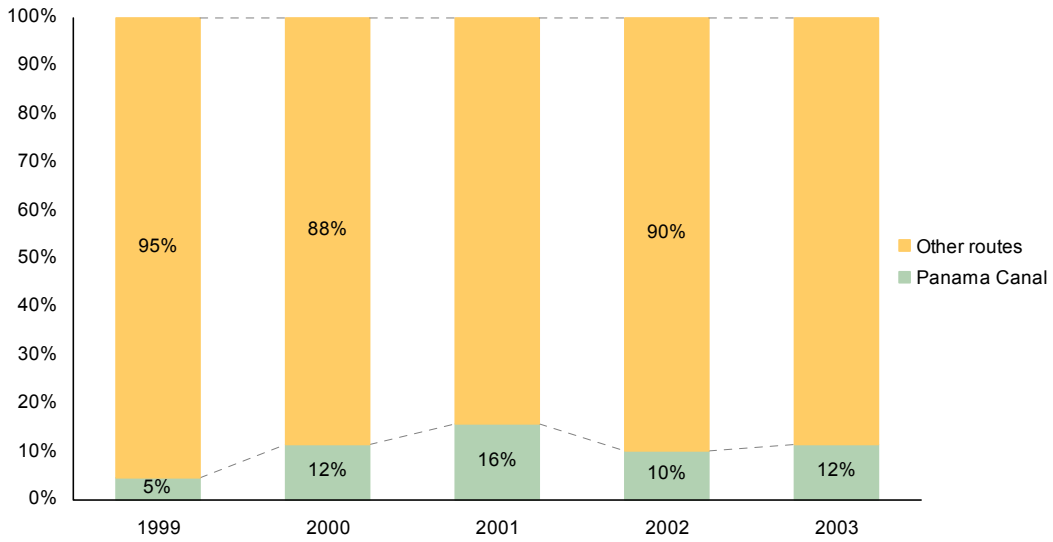
For the period 2000-2003, an average of 11 percent of total Peru iron export tons transited the Canal (Exhibit 5-31).

The value of total Peru iron ore exports in 2003 was $94 million Iron ore transiting the Canal represents 12 percent of total iron ore exports by value and thus 0.1 percent of total Peruvian exports (Exhibit 5-32).

Exhibit 5-31

Canal Transit Share of Peruvian Iron Ore Exports: 1999-2003

(percentage of tons)

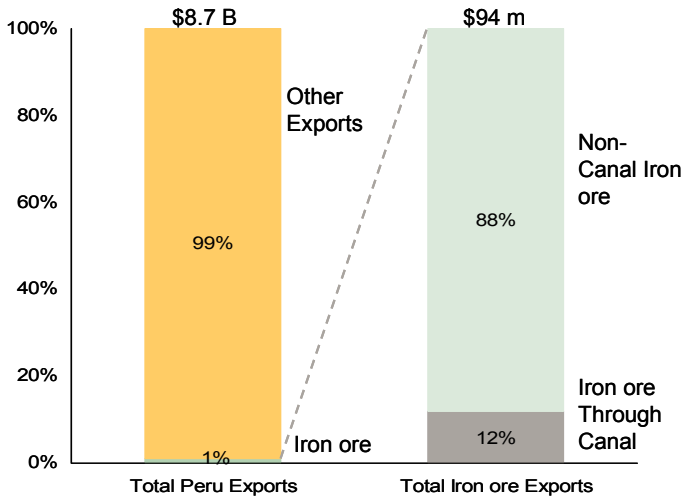


Source: Mercer analysis, UN Comtrade, ACP database.

Exhibit 5-32

Canal Transit Share of Total Iron Ore Exports: 2003

(percentage of US$)



Source: Mercer analysis, UN Comtrade, Central Bank of Peru, ACP data.

5.9.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-33 shows the cost components of the calculated CIF for Peru iron ore exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represents 8.0 percent of Peruvian iron ore CIF.

Exhibit 5-33
Canal Transit Cost Share of Peru Exported Iron Ore CIF (Landed Cost)
(2003 values in US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Iron ore	$18.5	$4.8	$2.0	$25.3	8.0%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting iron ore through the Canal would have a significant impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that if the Canal toll were increased by a maximum of 200 percent, the CIF price for iron ore would increase by 12.7 percent, equivalent to US$ 3.22 per ton (Exhibit 5-34).

Exhibit 5-34
Sensitivity Analysis of Peruvian Iron Ore CIF

Toll increase	50%	100%	150%	200%
Iron ore CIF price impact	3.19%	6.38%	9.56%	12.75%
Iron ore new CIF price	US$ 26.09	US$ 26.89	US$ 27.70	US$ 28.51

Source: Mercer analysis.

5.9.3 Analysis of Commodity Relevance

Even though a 200 percent increase in Canal tolls would significantly impact the CIF price of iron ore moving from Peru to the East Coast of the US or Europe, only a small percentage of iron ore exports (12 percent) transit the Canal. Additionally, iron ore exports transiting the Canal represent only 0.1 percent of total Peruvian exports. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.10 Fish Oil

5.10.1 Overview

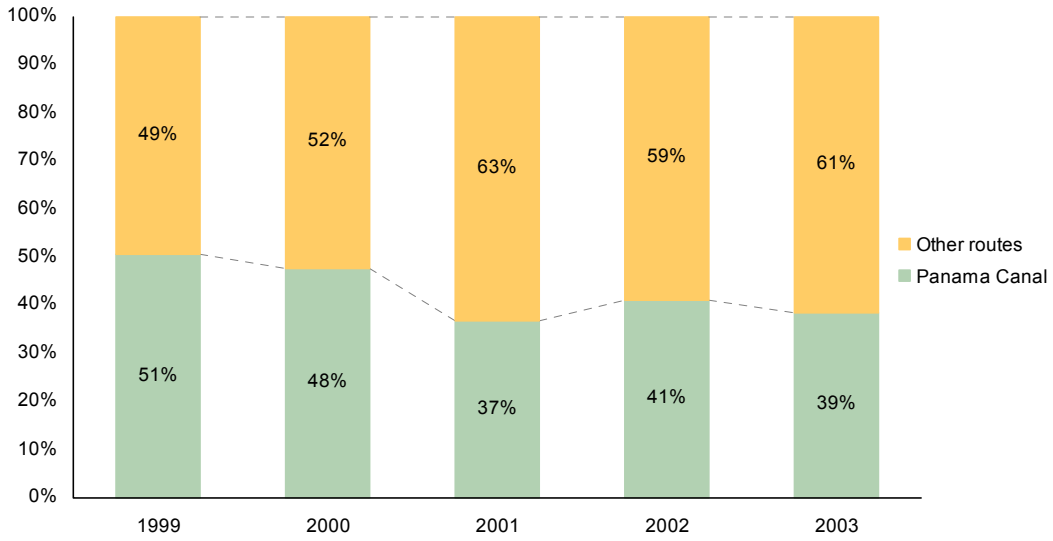
Fish product exports represent 9.4 percent of Peru's total exports. Fish oil accounts for 9.6 percent of fish product exports and 0.9 percent of Peru's total exports by value. During 2000-2003, an average of 42 percent of total Peru fish oil exports transited the Canal (Exhibit 5-35).

The value of total Peru fish oil exports in 2003 was $80 million. Fish oil exports transiting the Canal were 37 percent of total fish oil exports, or 0.3 percent of total Peruvian exports (Exhibit 5-36).

Exhibit 5-35

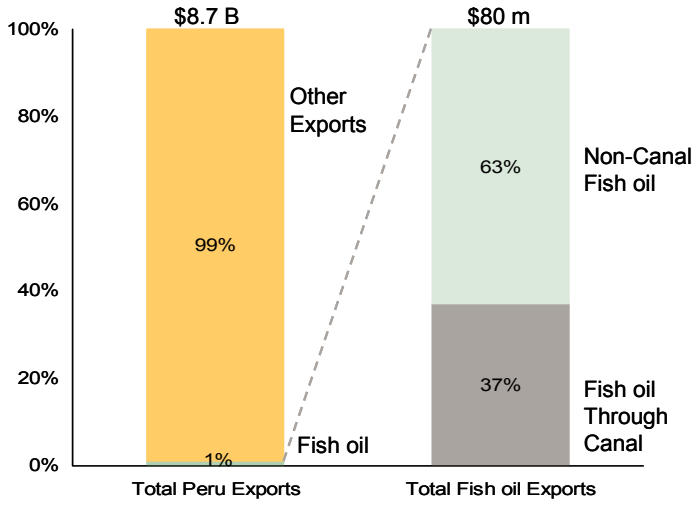
Canal Transit Share of Peru's Fish Oil Exports: 1999-2003

(percentage of tons)



Source: Mercer analysis, UN Comtrade, Central Bank of Peru, ACP database.

Exhibit 5-36
Canal Transit Share of Total Fish Oil Exports: 2003
(percentage of US$)



Source: Mercer analysis, UN Comtrade, Central Bank of Peru, ACP data.

5.10.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-37 shows the cost components of the calculated CIF for Peru fish oil exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represents 0.5 percent of Peruvian fish oil CIF.

Exhibit 5-37
Canal Transit Cost Share of Peru Exported Fish Oil CIF (Landed Cost)
(2003 values in (US$/ton)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Fish oil	$433	$81.1	$2.4	$516	0.5%

Source: Mercer analysis, UN Comtrade, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting fish oil through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for fish oil would increase by 0.7 percent, equivalent to US$ 3.58 per ton, if the Canal toll were increased by a maximum of 200 percent (Exhibit 5-38).

Exhibit 5-38
Sensitivity Analysis of Peruvian Fish Oil CIF

Toll increase	50%	100%	150%	200%
Fish oil CIF price impact	0.17%	0.35%	0.52%	0.69%
Fish oil new CIF price	US$516.98	US$ 517.98	US$ 518.77	US$ 519.66

Source: Mercer analysis.

5.10.3 Analysis of Commodity Relevance

Peru fish oil exports transiting the Canal represent only 0.3 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.11 Edible Vegetables

5.11.1 Overview

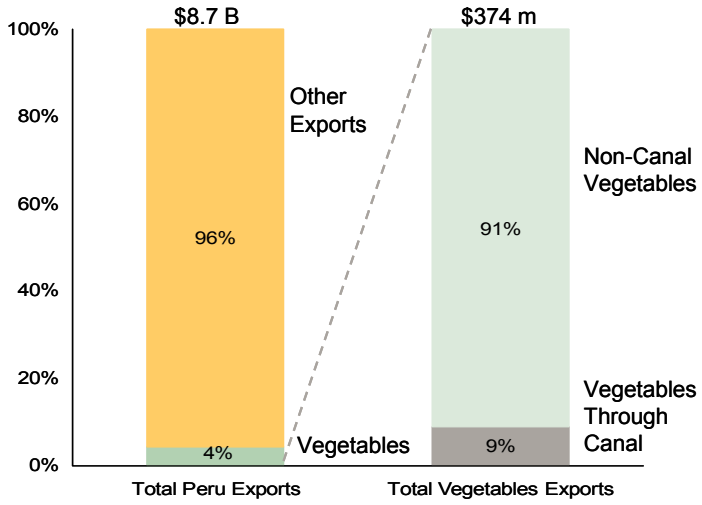
Edible vegetable exports in the case of Peru consist mainly of containerized onions and asparagus. In 2003, approximately 12 percent of Peru's containerized cargo that transited the Canal were vegetables.[6]

For containerized vegetables, 2003 US Waterborne Commerce and Eurostat data for containerized Peruvian vegetables was used and an average for vegetables was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2 tons/TEU[7] and the Canal charges per TEU are valued at $40.6 and Canal tolls at $30.5 dollars.

These analyses determined that the value of total Peru vegetables exports in 2003 was $374 million. Edible vegetable exports transiting the Canal represent 9 percent of total vegetables exports and 0.4 percent of total Peruvian exports by value (Exhibit 5-39).

[6] 2003 US Waterborne Commerce Peru imports, Eurostat, ACP data, Mercer analysis.
[7] ACP 2004 Demand Forecast Model.

Exhibit 5-39
Canal Transit Share of Peru's Vegetables Exports: 2003
(percentage of US$)



Source: Mercer analysis, UN Comtrade, Eurostat, Central Bank of Peru, ACP data.

5.11.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-40 shows the cost components of the calculated CIF for Peru vegetables exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represent 0.5 percent of Peruvian vegetables CIF.

Exhibit 5-40
Canal Transit Cost Share of Peru Exported Vegetables CIF (Landed Cost)
(2003 values in US$/TEU)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Vegetables	$6,321	$1,793	$40.6	$8,216	0.5%

Source: Mercer analysis, UN Comtrade, US Waterborne, ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting vegetables through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for vegetables would increase by 0.74 percent, which is equivalent to US$61 per TEU, if the Canal toll were increased by a maximum of 200 percent (Exhibit 5-41).

Exhibit 5-41
Sensitivity Analysis of Peruvian Vegetables CIF

Toll increase	50%	100%	150%	200%
Vegetables CIF price impact	0.19%	0.37%	0.56%	0.74%
Vegetables new CIF price ($/TEU)	US$8,231	US$8,246	US$8,261	US$8,277

Source: Mercer analysis

5.11.3 Analysis of Commodity Relevance

Peruvian vegetable exports transiting the Canal represent only 0.4 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.12 Coffee

5.12.1 Overview

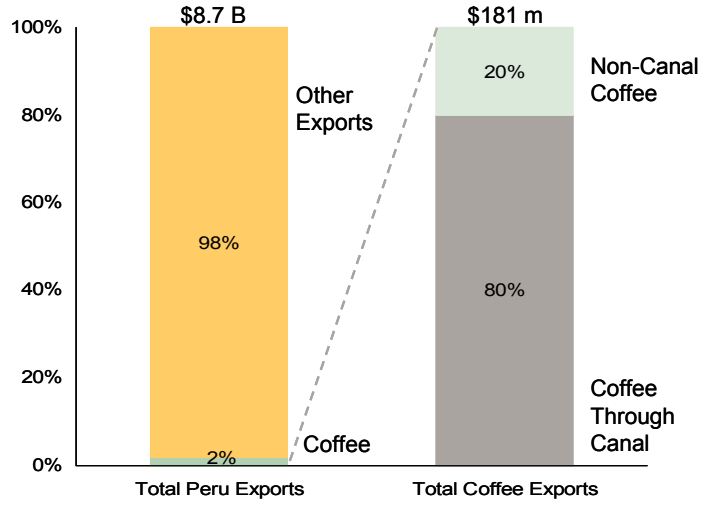
Out of the coffee, tea and mate commodity group, Peru mainly exports containerized coffee. In 2003 approximately 12 percent of Peruvian containerized cargo that transited the Canal was coffee.[8]

For coffee, 2003 US Waterborne Commerce and Eurostat data for containerized Peruvian coffee was used and an average for coffee was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2 tons/TEU[9] and the Canal charges per TEU are valued at $40.6 and Canal tolls at $30.5 dollars.

These analyses determined that the value of total Peru coffee exports in 2003 was $181 million. Coffee exports transiting the Canal represent 80 percent of total coffee exports and thus 1.7 percent of total Peru exports (Exhibit 5-42).

[8] 2003 US Waterborne Commerce Peru imports, Eurostat, ACP data, Mercer analysis.
[9] ACP 2004 Demand Forecast Model.

Exhibit 5-42
Canal Transit Share of Total Coffee Exports: 2003
(percentage of US$)



Source: Mercer analysis, UN Comtrade, Eurostat., Central Bank of Peru, ACP data.

5.12.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-43 shows the cost components of the calculated CIF for Peru coffee exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represent 0.3 percent of Peruvian coffee CIF.

Exhibit 5-43
Canal Transit Cost Share of Peru Exported Coffee CIF (Landed Cost)
(2003 values in US$/TEU)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Coffee	$12,992	$788	$40.6	$13,883	0.3%

Source: Mercer analysis, UN Comtrade, US Waterborne and ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting coffee through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for coffee would increase by 0.44 percent, equivalent to US$ 61 per TEU, if the Canal toll were increased by 200 percent (Exhibit 5-44).

Exhibit 5-44
Sensitivity Analysis of Peruvian Coffee CIF

Toll increase	50%	100%	150%	200%
Coffee CIF price impact	0.11%	0.22%	0.33%	0.44%
Coffee new CIF price	US$13,898	US$13,913	US$13,928	US$13,944

Source: Mercer analysis.

5.12.3 Analysis of Commodity Relevance

Although 80 percent of Peru coffee exports transit the Canal as containerized coffee, coffee represents only 1.7 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.13 Fruit

5.13.1 Overview

In 2003, approximately 2 percent of Peru's containerized cargo that transited the Canal was fruit.[10]

For containerized fruit, 2003 US Waterborne Commerce and Eurostat data for containerized Peruvian fruit was used and an average for fruit was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2 tons/TEU[11] and the Canal charges per TEU are valued at $40.6 and Canal tolls at $30.5 dollars.

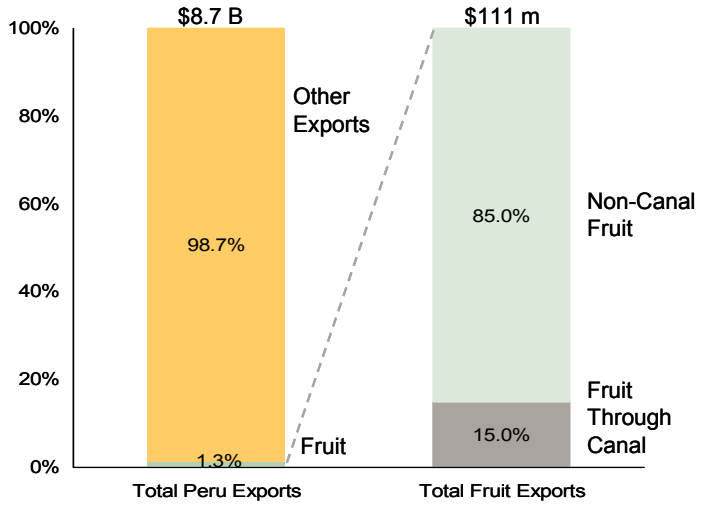
The value of total Peru fruit exports in 2003 was $111 million. Fruit exports transiting the Canal represent 15 percent of total fruit exports and thus represent 0.2 percent of total Peruvian exports by value (Exhibit 5-45).

[10] 2003 US Waterborne Commerce Peru imports, Eurostat, ACP data, Mercer analysis.
[11] ACP 2004 Demand Forecast Model.

Exhibit 5-45

Canal Transit Share of Total Fruit Exports: 2003

(percentage of US$)



Source: Mercer analysis, UN Comtrade, Central Bank of Peru, ACP data.

5.13.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-46 shows the cost components of the calculated CIF for Peru fruit exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represent 0.4 percent of Peruvian fruit CIF.

Exhibit 5-46

Toll as a Percentage of Peru Exported Fruit CIF (Landed Cost)

(2003 values in US$/TEU)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Fruit	$8,821	$1,611	$40.6	$10,533	0.4%

Source: Mercer analysis, UN Comtrade, US Waterborne and ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting fruit through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for fruit would increase by 0.58 percent, equivalent to US$ 61 per TEU, if the Canal toll were increased by 200 percent (Exhibit 5-47).

Exhibit 5-47
Sensitivity Analysis of Peruvian Fruit CIF

Toll increase	50%	100%	150%	200%
Fruit CIF price impact	0.14%	0.29%	0.43%	0.58%
Fruit new CIF price ($/TEU)	US$10,548	US$10,564	US$10,579	US$10,594

Source: Mercer analysis.

5.13.3 Analysis of Commodity Relevance

Peru fruit exports transiting the Canal represent only 0.2 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.14 Fish and Crustaceans

5.14.1 Overview

In 2003, approximately 6 percent of Peru's containerized cargo that transited the Canal were fish and crustaceans.[12]

For containerized fish and crustaceans, 2003 US Waterborne Commerce and Eurostat data for containerized Peruvian fish and crustaceans was used and an average for fish and crustaceans was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2 tons/TEU[13] and the Canal charges per TEU are valued at $40.6 and Canal tolls at $30.5 dollars.

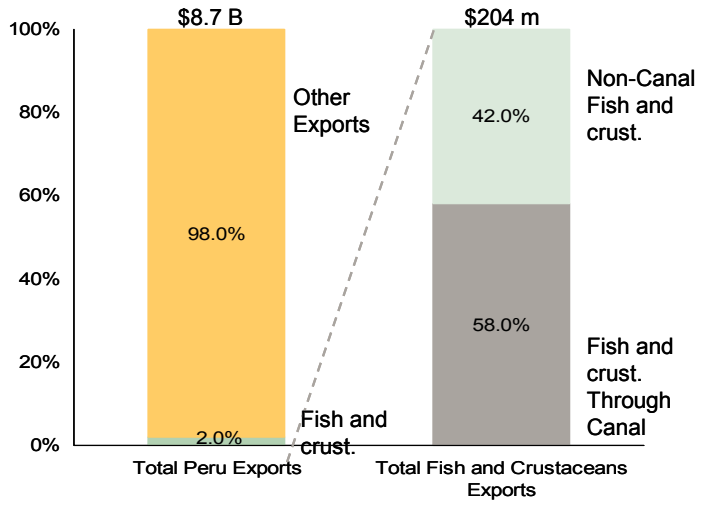
The value of total Peru fish and crustacean exports in 2003 was $204 million. Peru's fish exports transiting the Canal represent 58 percent of its total fish and crustacean exports and thus 1.6 percent of total Peruvian exports (Exhibit 5-48).

[12] 2003 US Waterborne Commerce Peru imports, Eurostat, ACP data, Mercer analysis.
[13] ACP 2004 Demand Forecast Model.

Exhibit 5-48

Canal Transit Share of Total Fish Exports: 2003

(percentage of US$)



Source: Mercer analysis, UN Comtrade, Eurostat, Central Bank of Peru, ACP data.

5.14.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-49 shows the cost components of the calculated CIF for Peru fish and crustaceans exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represent 0.2 percent of Peruvian fish and crustacean export CIF.

Exhibit 5-49

Canal Transit Cost Share of Peru Exported Fish CIF (Landed Cost)

(2003 values in US$/TEU)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Fish and crustaceans	$15,218	$1,354	$40.6	$16,674	0.2%

Source: Mercer analysis, UN Comtrade, US Waterborne and ACP data.

Based on this analysis, it can be expected that an increase in the toll for fish through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for fish and crustacean exports would increase by 0.37 percent, equivalent to US$ 61 per TEU, if the Canal toll were increased by 200 percent (Exhibit 5-50).

Exhibit 5-50
Sensitivity Analysis of Peruvian Fish Exports CIF

Toll increase	50%	100%	150%	200%
Fish and crustaceans CIF price impact	0.09%	0.18%	0.27%	0.37%
Fish and crustaceans new CIF price ($/TEU)	US$16,698	US$16,704	US$16,719	US$16,735

Source: Mercer analysis.

5.14.3 Analysis of Commodity Relevance

Total fish and crustacean exports transiting the Canal represent only 1.6 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.15 Wood

5.15.1 Overview

Peru exports a wide variety of wood products such as boards, plywood, veneer and lumber. For this analysis, data at an HS2 level were analyzed for the commodity code 44 (wood and articles of wood). In 2003, approximately 1.9 percent of Peru's containerized cargo that transited the Canal were wood products.[14]

For containerized wood, 2003 US Waterborne Commerce and Eurostat data for containerized Peruvian wood was used and an average for wood was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2 tons/TEU[15] and the Canal charges per TEU are valued at $40.6 and Canal tolls at $30.5 dollars.

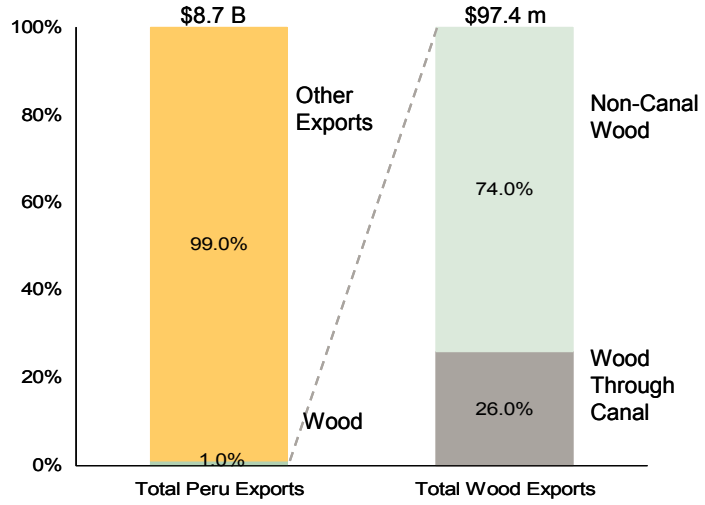
The value of total Peru wood exports in 2003 was $97.4 million. Peru's wood exports transiting the Canal represent 26 percent of its total wood exports and thus 0.3 percent of total Peruvian exports (Exhibit 5-51).

[14] 2003 US Waterborne Commerce Peru imports, Eurostat, ACP data, Mercer analysis.
[15] ACP 2004 Demand Forecast Model.

Exhibit 5-51

Canal Transit Share of Total Wood Exports: 2003

(percentage of US$)



Source: Mercer analysis, UN Comtrade, Eurostat, Central Bank of Peru, ACP data.

5.15.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-52 shows the cost components of the calculated CIF for Peru wood exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represent 0.4 percent of Peruvian wood exports CIF.

Exhibit 5-52

Canal Transit Cost Share of Peru Exported Wood CIF (Landed Cost)

(2003 values in US$/TEU)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Wood	$9,187	$521	$40.6	$9,810	0.4%

Source: Mercer analysis, UN Comtrade, US Waterborne and ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting wood through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for wood exports would increase by 0.62 percent, which is equivalent to US$61 per TEU, if the Canal toll were increased by 200 percent (Exhibit 5-53).

Exhibit 5-53
Sensitivity Analysis of Peruvian Wood CIF

Toll increase	50%	100%	150%	200%
Wood CIF price impact	0.16%	0.31%	0.47%	0.62%
Wood new CIF price ($/TEU)	US$9,825	US$9,840	US$9,855	US$9,871

Source: Mercer analysis.

5.15.3 Analysis of Commodity Relevance

Peru wood exports transiting the Canal represent only 0.3 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.16 Vegetable and Fruit Preparations

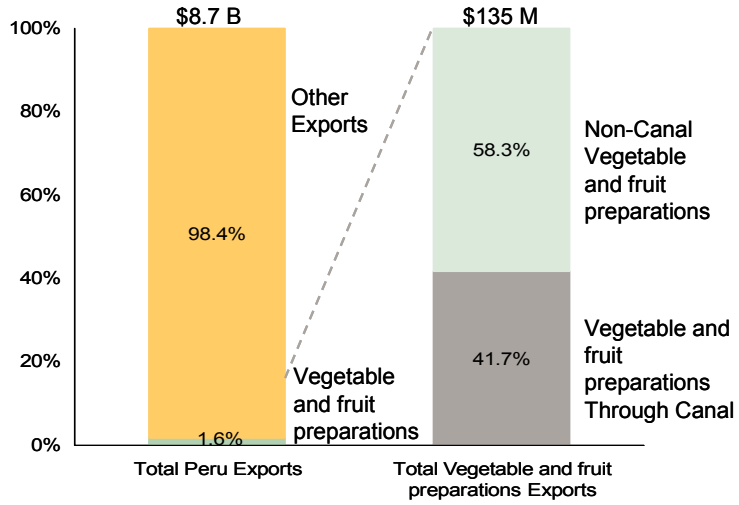
Peru exports a wide variety of vegetable and fruit preparations. For this analysis, data at an HS2 level were analyzed for the commodity code 20 (vegetable and fruit preparations). In 2003 approximately 6 percent of Peru's containerized cargo that transited the Canal were vegetable and fruit preparations products.[16]

For containerized vegetables and fruit preparations, 2003 US Waterborne Commerce and Eurostat data for containerized Peruvian vegetables and fruit preparations was used and an average for vegetables and fruit preparations was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2 tons/TEU[17] and the Canal charges per TEU are valued at $40.6 and Canal tolls at $30.5 dollars.

The value of total Peru vegetable and fruit preparation exports in 2003 was $135.8 million. Peruvian vegetable preparation exports transiting the Canal represent 41.7 percent of total vegetable prep. exports and thus 0.06 percent of total Peru exports by value (Exhibit 5-54).

[16] 2003 US Waterborne Commerce Peru imports, Eurostat, ACP data, Mercer analysis.
[17] ACP 2004 Demand Forecast Model.

Exhibit 5-54
Canal Transit Share of Total Vegetable Prep. Exports: 2003
(US$)



Source: Mercer analysis, UN Comtrade, Eurostat, Central Bank of Peru, ACP data.

5.16.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-55 shows the cost components of the calculated CIF for Peru vegetable and fruit preparation exports. Using the methodology described in section 5.1, the analysis found that that total Canal charges represents 0.3 percent of CIF for this commodity.

Exhibit 5-55
Canal Transit Cost Share of Peru Exported Vegetable Prep. CIF
(2003 values in US$/TEU)

	FOB	Charges (Freight & Insurance)	Total Canal Charges	Total CIF	Canal Charges as % of CIF
Vegetable and fruit preparations	$10,781	$971	$40.6	$11,853	0.3%

Source: Mercer analysis, UN Comtrade, US Waterborne and ACP data.

Based on this analysis, it can be expected that an increase in the toll for ships transporting vegetable preparations through the Canal would have a low impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for vegetable and fruit preparations would increase by 0.52 percent, equivalent to US$ 61 per TEU, if the Canal toll were increased by 200 percent (Exhibit 5-56).

Exhibit 5-56
Sensitivity Analysis of Peruvian Vegetable and Fruit Preparations CIF

Toll increase	50%	100%	150%	200%
Vegetable and fruit preparations CIF price impact	0.13%	0.26%	0.39%	0.52%
Vegetable and fruit preparations new CIF price ($/TEU)	US$11,869	US$11,884	US$11,899	US$11,914

Source: Mercer analysis.

5.16.3 Analysis of Commodity Relevance

Peru vegetable and fruit preparations exports transiting the Canal represent only 0.06 percent of Peru's total exports. Furthermore, a 200 percent increase in Canal tolls would have a low impact on the CIF price and demand would not be expected to be affected. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade or economy.

5.17 Analysis of Total Relevant Peruvian Imports

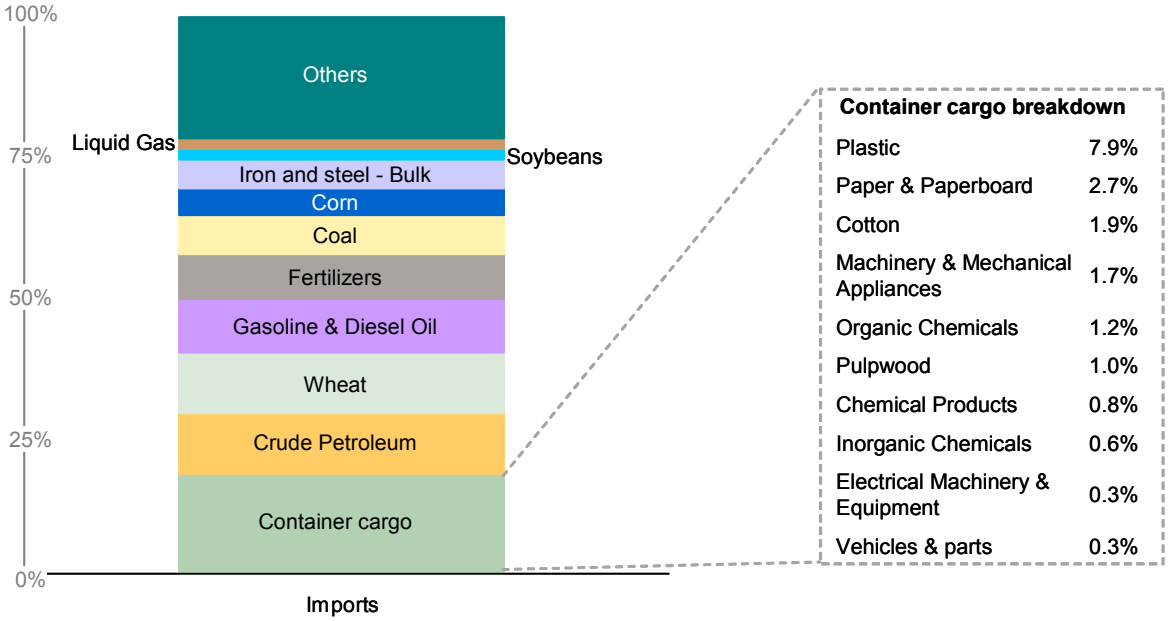
To ensure a thorough analysis of the effects of an increase in Panama Canal tolls, Peru's commodity imports were analyzed in addition to exports. For the purposes of this analysis, only the most significant commodities, representing approximately 64 percent of Peruvian import tons passing through the Panama Canal, were analyzed.

Exhibit 5-57 shows a breakdown of commodities imported into Peru. The largest Canal-relevant imports for Peru include iron & steel, fertilizers, containerized cargo, and raw sources of energy. The principal energy related imports include crude oil, gasoline, diesel oil, and liquid gas; the main containerized cargo imports are composed of plastics, paper & paperboard, cotton, and machinery & mechanical appliances.

Exhibit 5-57

1999-2003 Average Canal Relevant Total Peruvian Imports

(percentage of tons)



Source: Mercer analysis, U.S. Waterborne database 2003, ACP database.

An increase in Canal tolls will increase the final landed price for imported commodities. There are various methods by which the impact of such increases on the Peruvian economy can be evaluated:

- One approach would be to examine the effect of the Panama Canal toll increases on the final consumer price for all of the relevant commodities imported. This method would evaluate the impact of a Canal toll increase relative to import tariffs, inland transportation costs, distribution and retailer mark-ups, and final state and federal taxes, and would take into account the total impact on Peru's CPI (Consumer Price Index) and consequently on inflation.

- A more technical approach would be to evaluate the impact of a Canal toll increase on Peru's inflation and GDP by performing an analysis to capture the relationship between major US macroeconomic variables.

- A third option would be to focus on the final landed cost of each commodity. An increase in the cost of imports from a Canal toll increase will reduce the current account (exports minus imports), which is part of national income, and as a result reduce the output (GDP) of the Peruvian economy, assuming that everything else is constant. Therefore, a Panama Canal toll increase would be equivalent to a transfer of income from Peru to Panama through a shift in the terms of trade.

After considering the above approaches within the context of the scope and goals of the present study, the ACP decided to pursue the third option, a general analysis of the impact of toll increases on the final landed cost of significant import commodities. The magnitude of the direct effect (e.g., inflation) of a given toll increase depends mainly on:

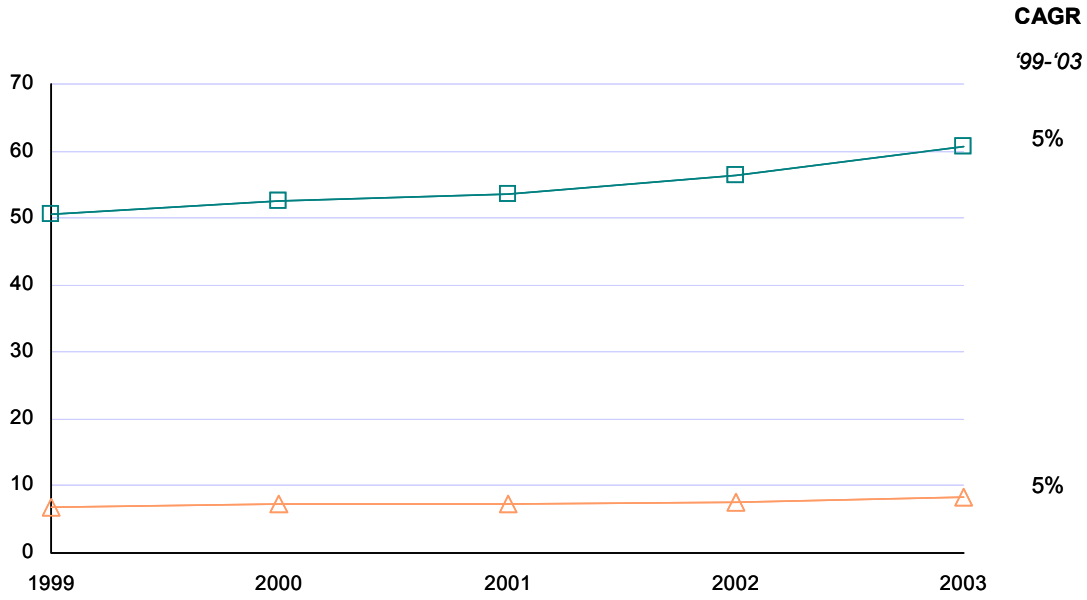
- The share of Peru's national income represented by the imports that are passing through the Panama Canal
- The Peruvian economy's degree of dependence on these imports
- The ability of end-users to reduce their consumption and/or substitute alternative products or sources

Exhibit 5-58 shows the relative significance of international imports trade to Peru's economy. From 1999 to 2003, Peru's GDP grew an average of 5 percent per year, as fast as merchandise imports.

Exhibit 5-58

Total Peru GDP and Merchandise Imports (CIF): 1999-2003

(US$ billions, current prices)



Source: International Monetary Fund World Economic Outlook Database (September 2004), UN COMTRADE.

As mentioned above, approximately 64 percent of Peru's merchandise imports that transit the Canal were analyzed in order to determine their share of total imports (CIF value) and of GDP. Exhibit 5-59 illustrates the relevant values used for this analysis.

Exhibit 5-59

Canal-Relevant Peruvian Imports Analyzed

Commodity	Canal Share	Canal Transit Tons 2003	Average CIF/Ton	CIF Value of Canal Transit Tons
Crude petroleum	11%	634,097	$ 201	$ 127,311,581
Wheat	11%	969,962	$ 162	$ 157,176,274
Diesel oil & gasoline	10%	523,684	$ 286	$ 149,957,581
Fertilizers, misc.	8%	424,441	$ 175	$ 74,179,494
Coal	7%	355,281	$ 44	$ 15,756,918
Corn	5%	82,875	$ 131	$ 10,828,007
Iron and steel	5%	259,237	$ 583	$ 151,112,150
Soybeans	2%	5,512	$ 252	$ 1,386,851
Liquefied gas	2%	202,062	$ 368	$ 74,281,000
Container cargo	4%	207,333	$ 2,181	$ 452,165,123
Other	36%	2,097,332		
Total CIF Value of Panama Canal Transit Tons				**$ 1,214,154,977**

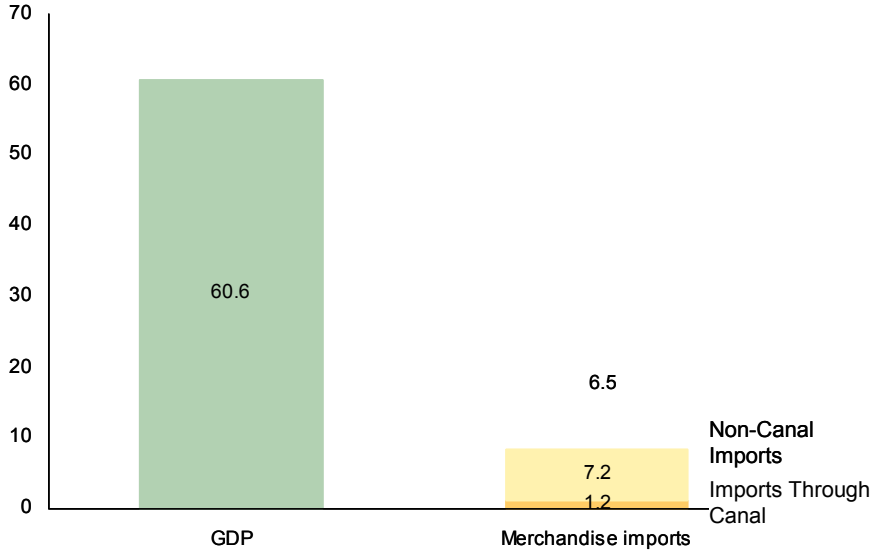
Source: Mercer analysis, UN COMTRADE , ACP database, US Waterborne 2003 database.

In 2003, Peru's Canal-relevant imports accounted for 14 percent of its total merchandise imports (valued in CIF terms). Additionally, Peru's imports transiting the Panama Canal represented only 2 percent of Peru's GDP in 2003. This shows that Peru does not have a high dependence on the Canal for its imports, and consequentially, in relation to its economy overall (Exhibit 5-60).

Exhibit 5-60

Peru's GDP and Canal Relevant Merchandise Imports: 2003

(US$ billions, current prices)



Source: International Monetary Fund World Economic Outlook Database (Sept. 2004), UN COMTRADE, ACP data.

In 2003, Peru's current account deficit was US$1 billion, or 1.7 percent of GDP. An increase in import prices, due to an increase in Canal tolls, would increase the deficit and reduce the national income.

Our analysis, however, determined that the impact would be very small – even if tolls were increased by 200 percent for all Peruvian imports that transit the Canal, the cost of total goods imports would grow by 1.2 percent, the current account would remain at 1.7 percent of GDP, and national income would drop by about 0.02 percent. An impact of only 0.02 percent on Peru's GDP would not materially affect Peru's economy.

6

Assessment of the Impact of Panama Canal Transit Cost Changes

The analysis in section five determined that an increase in the Panama Canal toll would not have a significant impact on the final landed cost of Canal-relevant Peruvian export and import commodities (with the exception of salt and iron ore). Therefore, there would be no significant impact on the Peruvian economy as a whole.

6.1 Impact of Transit Cost Changes for Exports

For exports, each significant Canal-relevant commodity (17 commodities) was analyzed independently to determine the impact of an increase in the Panama Canal toll for ships carrying that commodity. The following factors were considered in order to determine how much the commodity and any related industry would be affected, and how significant this impact would be on the Peruvian economy:

- The portion of the exported commodity that transits the Canal
- The relative importance of the commodity to total Peruvian exports
- The Canal-toll's impact on the final landed cost of the commodity (CIF)

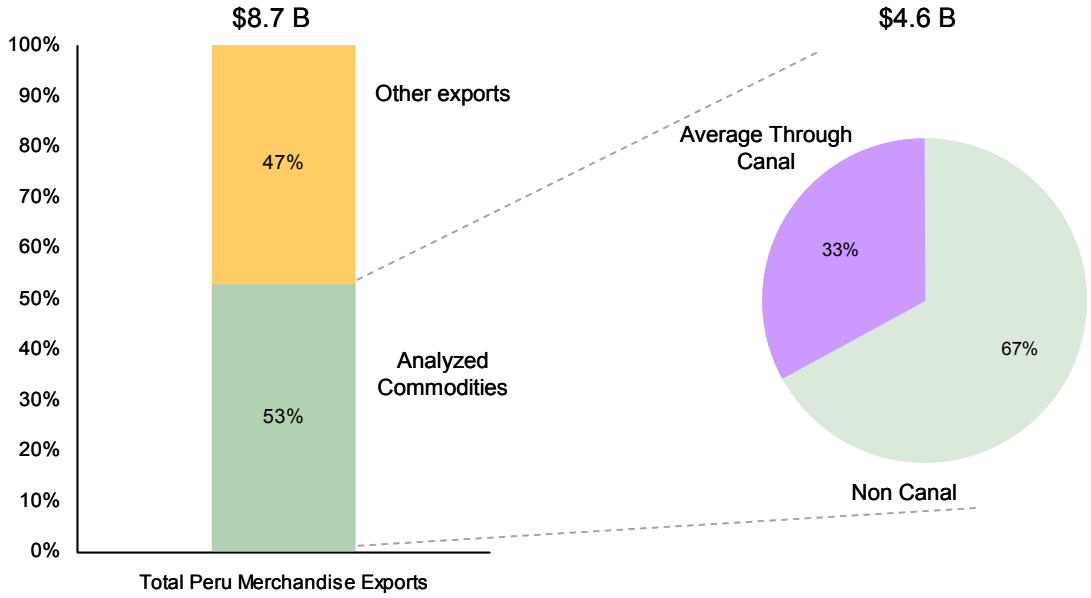
6.1.1 Exported Commodities that Transit the Canal

Of the 17 commodities analyzed in this report, Canal exported quantities account for different shares of each commodity's total exports. In some cases, like salt, zinc metal, coffee, and fish, more than 50 percent of Peru's exports of this commodity transit the Panama Canal. In other cases, only 20-50 percent of a commodity's exports are transported through the Panama Canal, including bulk copper metal, copper ore, gasoline,

fishmeal, fish oil, zinc ore, wood, and vegetable preparations. Less than 20 percent of exports of crude petroleum, residual fuel oil, iron ore, vegetables, fruit, and containerized copper metal transit the Canal.

Exhibit 6-1 shows that the total value of export commodities analyzed in this report represented approximately 53 percent of Peru's total merchandise exports in 2003, and that approximately 33 percent of this value transited the Panama Canal. Overall, in 2003, the value of export commodities analyzed in this report represent17 percent of total Peruvian merchandise exports. Panama Canal relevant exports, including all containerized cargo, make up 27 percent of total Peru merchandise exports.[18]

Exhibit 6-1
Panama Canal Transit Share of Analyzed Exports
(US$)



Source: Banco Central de Peru, ACP, 2003 US Waterborne Commerce imports and exports, UN Comtrade, Mercer analysis.

6.1.2 Commodity Importance Relative to Peruvian Exports

A portion of the analyzed export commodities are not only Canal-relevant, but also represent an important portion of total Peruvian exports. In 2003, copper (refined copper and copper ore) exports accounted for 15 percent of Peru's total exports, fishmeal exports accounted for 8.5 percent, zinc (refined zinc and zinc ore) accounted for 7 percent, and vegetables accounted for 4.3 percent. The other analyzed commodities represent less than 4 percent of total exports each.

[18] All containerized cargo includes containerized commodities that were not examined individually in this report. The value of containerized commodities was calculated using a weighted average of the FOB price of analyzed container commodities and the remaining tonnage of containerized cargo which was not analyzed.

6.1.3 Canal Transit Cost Impact on Final Landed Cost

The second phase of the analysis focused on determining the relevance of the total Canal transit cost (Canal toll plus other marine services) to the total CIF of each commodity; and developing a sensitivity analysis for each commodity for a Canal toll of up to 200 percent.

In general, the higher the value of a commodity's CIF, the lower the portion of the Canal cost relative to each commodity's CIF. This signifies that for higher-value commodities, the impact of a Canal toll increase will be lower. With the exception of salt and iron ore, the Canal cost is not a significant portion of the analyzed commodities' CIF; however, given the importance of copper, zinc, and fishmeal to the Peruvian economy, further analysis was carried out to understand the potential effects of an increase in Canal tolls on demand for these commodities. Salt and iron ore were also analyzed on a standalone basis to determine the potential impact of a Canal toll increase.

Copper

As mentioned above, copper exports represent 15 percent of Peru's total exports, and approximately 45 percent of these exports (bulk and containerized copper) transit the Panama Canal destined for Europe and the United States. Copper is a high value commodity, and thus, the Canal cost is a small portion of the total CIF cost, 0.1 percent for refined copper and 0.5 percent for copper ore. As a result, a maximum increase in Canal tolls of 200 percent would impact refined copper CIF by 0.22 percent and copper ore CIF by 0.76 percent.

European demand for copper is expected to grow steadily and the trade appears to be relatively insensitive to transit cost increases, due to the lack of product or source substitutes and copper's high value. The US is not expected to be able to satisfy its demand from its own production, so exports from Peru into the US are expected to remain stable. Furthermore, the growth markets for copper are China and other Asian countries, which would not be affected by an increase in Canal tolls. As a result of these market dynamics, even a 200 percent increase in Canal tolls (the maximum analyzed in this study) would not significantly affect copper CIF and more importantly, Peruvian copper exports. Moreover, given anticipated demand increases from Europe and Asia, the more relevant issue will be Peru's capacity to satisfy this demand.

Zinc

Peru is a major zinc exporter, with few alternative sources. The Canal cost represents only 0.38 percent of zinc metal and 1.44 of zinc ore CIF, thus an increase in the Canal toll would not materially affect the landed cost and the competitive landscape. Peru is the dominant producer of exported zinc, and zinc represents only 6.7 percent of Peru's total

exports. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade and economy nor on the industry's role in the Peruvian economy.

Fishmeal

Peru is the world's dominant producer and exporter of fishmeal. The Canal cost represents only 0.73 percent of fishmeal's CIF, thus an increase in the Canal toll would not materially affect the landed cost and the competitive landscape. Furthermore, Peru fishmeal exports transiting the Panama Canal represent only 1.8 percent of Peru exports; most exports of fishmeal are destined for Asia. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade and economy nor on the industry's role in the Peruvian economy.

Iron Ore

Even though a 200 percent increase in Canal tolls would highly impact the CIF price of iron ore traveling to the East Coast of the US or Europe, only a small percentage of iron ore exports transit the Canal (12 percent). As a result of this analysis, it was determined that iron only represents 1 percent of Peru total exports and that Peru iron ore exports transiting the Canal are only 0.1 percent of total Peru exports. Therefore, the impact of a Canal toll increase would not have a significant effect on Peru's trade and economy.

Salt

Peru's salt exports only account for 3 percent of mining exports and around 0.04 percent of total exports. All Peru's salt exports transit the Panama Canal to the East Coast of the US.

The analysis of Canal toll cost relevance to salt CIF revealed that Canal charges are 8.3 percent of CIF, which indicated that the landed cost is highly sensitive to Canal toll increases. A 200 percent increase in Canal tolls would affect the CIF price of salt by 12.93 percent or US$3.1 per ton. Given that the US has multiple supply sources on the Atlantic side, an increase in the CIF price of salt could significantly displace Peruvian imports; however, this increase would need to affect CIF price by US$8, given that the difference between the CIF of imported salt and salt directly out of the mine is on the order of US$8. Finally, although a 200 percent increase in Canal tolls would significantly impact the CIF of salt and thus reduce exports; this effect would not materially impact the Peruvian economy given that salt represents a very minor portion of Peru's export commodity mix.

For each export discussed in this report (Exhibit 6-2), the Canal transit cost was analyzed to determine its importance to the final landed cost (CIF) of the commodity. The analysis determined that the total Canal transit cost for 15 of the 17 analyzed commodities (the exceptions being salt and iron ore) represented less than 1.3 percent of the commodity's

CIF. Therefore, even with a 200 percent increase in the Panama Canal toll for these commodities, none of these commodities' CIF would increase by more than 2 percent.

Exhibit 6-2

Summary of Canal-Relevant Exports Analysis by Commodity

(US$ millions)

Commodity	1. FOB Value of Canal Exports	2. Canal Share of Total Exports	3. Total Export Value	4. Commodity Exports Share of Peru's Exports	5. Canal Transit Cost Share of CIF	6. 200% Toll Increase Impact on CIF
Bulk						
Copper metal	$1,727.62	34.5%	$913.9	10.4%	0.1%	0.22%
Copper ore	$403,27	34.2%	$421.9	4.8%	0.5%	0.76%
Crude petroleum	$170.30	16.3%	$266.2	3.0%	1.0%	1.57%
Gasoline	$224.38	47.2%	$76.4	0.9%	1.2%	1.84%
Residual fuel oil	$178.75	15.5%	$324.7	3.7%	1.2%	1.89%
Fishmeal	$541.00	21.2%	$742.0	8.5%	0.5%	0.73%
Fish oil	$432.57	37.0%	$80.1	0.9%	0.5%	0.69%
Iron ore	$18.50	11.8%	$94.05	1.1%	8.0%	12.75%
Salt	$8.40	100%	$3.3	0.04%	8.3%	12.93%
Zinc metal	$840.25	98.7%	$163.1	1.9%	0.3%	0.38%
Zinc ore	$216.77	33.9%	$430.1	4.9%	1.0%	1.44%
Container						
Vegetables	$564.41	9.1%	$374.7	4.3%	0.5%	0.74%
Coffee	$1,160.04	80.4%	$181.05	2.1%	0.3%	0.44%
Fruit	$787.57	15.4%	$111.2	1.3%	0.4%	0.58%
Fish and crustaceans	$2,205.54	57.6%	$240.0	2.7%	0.2%	0.37%
Wood	$1,306.79	26.0%	$97.3	1.1%	0.4%	0.62%
Copper metal	$1,971.42	15.3%	$913.9	10.4%	0.3%	0.43%
Vegetable prep.	$963.55	41.7%	$135.8	1.6%	0.3%	0.52%

Description of columns:

7 The merchandise FOB value of the Canal-relevant portion of exports for each commodity

8 The percent of the total FOB export value for each commodity that transited the Canal

9 The total FOB value of all Peruvian exports of each commodity, regardless of transportation mode or route

10 The percent of total Peruvian exports FOB value accounted for by each commodity

11 The percent of the final landed cost (CIF) of each commodity accounted for by the total Canal transit costs (toll, other marine services) of that commodity

12 The percent change in the CIF as a result of a 200 percent increase in the Panama Canal toll for ships carrying this commodity

6.2 Impact of Transit Cost Changes for Imports

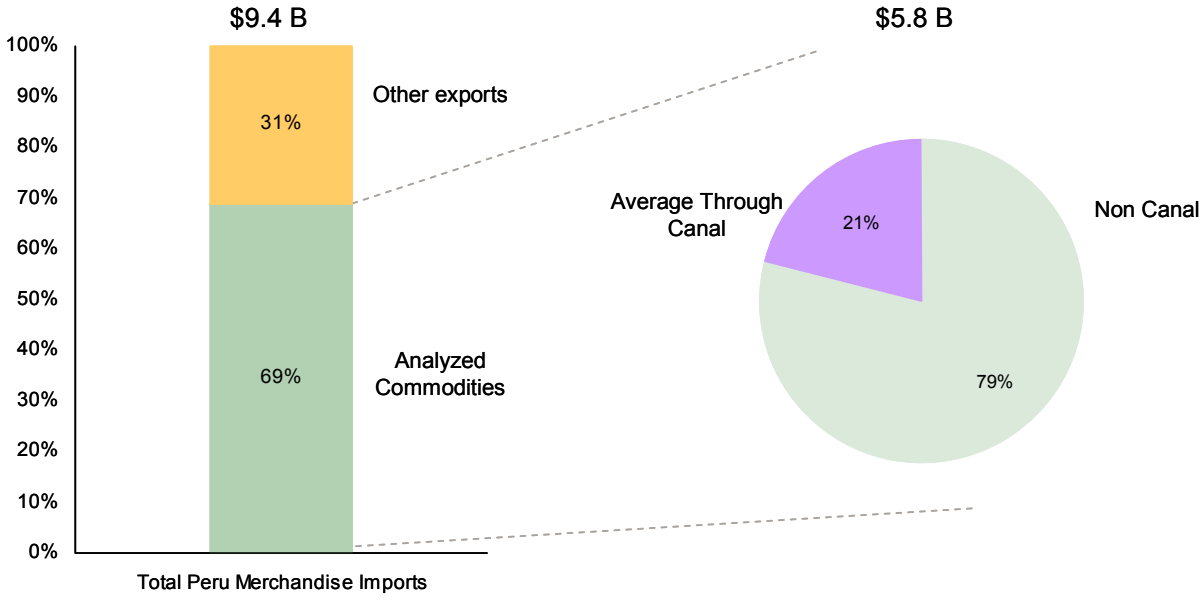
With respect to imports, a different approach was used in order to determine the impact of Canal toll increases on Peru's imports and on the Peruvian economy. The analysis was focused on the final landed cost of each commodity and the impact of the aggregated value of Canal-relevant imports to total Peruvian imports and GDP.

In 2003, 14.4 percent of Peru's total US$9.4 billion in import value transited the Panama Canal (Exhibit 6-3). An analysis of Peru's Canal-relevant import commodities determined that the effect of a Canal toll increase on the total cost of Peru's imports and on GDP would be negligible. If the toll were to increase by 200 percent, the cost of Peru's total imports would increase by only 0.17 percent, with a minimal impact on GDP of -0.02 percent.

Exhibit 6-3

Panama Canal Transit Share of Analyzed Imports

(US$ billions)



Source: Banco Central de Peru, ACP, 2003 US Waterborne Commerce imports and exports, UN COMTRADE, Mercer analysis.

Considering the very small increase in import costs represented by an increase in Canal transit costs, and the fact that the Canal toll is only one of many costs involved in bringing a commodity from origin to destination and impacting a commodity's final cost to the end consumer, the Canal transit cost increase would not be a significant contributor to inflation.

6.3 Conclusions

Based on the analyses developed in this report, an increase in Panama Canal transit costs for ships carrying goods exported from Peru would represent a very small component of total landed cost, and therefore would not have a significant impact on the economy of Peru nor on the principal Peruvian industries that provide Canal-relevant export commodities. Even though many of the analyzed Canal-relevant commodities transit more than 20 percent of their value through the Canal, only copper transiting the Canal accounted for more than 3 percent of total Peru exports. Furthermore, for only two of the analyzed commodities (salt and iron ore) the Canal cost represents a significant portion of the CIF, but both salt and iron ore exports are a very small portion of Peru total exports and the portion of iron ore transiting the Canal with respect to total iron ore exports is small.

Equally, for imports, Canal transit costs represent a very small portion of landed cost; additionally, the most significant Canal-relevant imports analyzed in this report only account for 14.4 percent of total Peruvian imports. Even a large Canal toll increase would have virtually no effect on the cost of total Peruvian imports nor on Peru's GDP.

The most important question at present with regard to the Canal – and of relevance to the Peruvian economy – is not the potential impact of transit cost changes, but whether the Canal will have sufficient capacity available to meet future demand, while providing an adequate level service. The implications for critical supply chains that serve Peru's economy of a deterioration in service – due to increased wait times or decreased reliability, for example – in the event that Canal capacity fails to meet demand, are of vital concern. The Canal will be able to meet future capacity needs only if it can generate the necessary funds from tolls to cover capital expenses; this requirement, in terms of its potential impact on Peru's trade and the economy, far outweighs the essentially negligible impact of the transit cost increases examined in this study.

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