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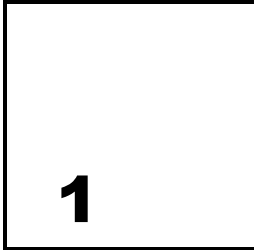
Assessment of the Impact of Panama Canal Transit Cost Changes on the Chilean Economy



MERCER
Management Consulting

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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 Chilean 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 Chile's economy, representing approximately 80 percent of total volume that trades through the Canal to and from Chile. For each commodity, the analysis examines the relevance of Canal-based traffic to overall Chilean imports and exports and the impact of transit cost increases on overall landed costs and Chile's economy.

Chilean Waterborne Trade

Chile is one of South America's strongest economies, with GDP of US \$89 billion in 2004. Chile's total international trade grew by an annual compound rate of 2 percent during 1996-2004, with exports growing more than twice as fast as imports. Chile is highly dependent on exports for continued growth, as its internal consumption rate is lower than its production capacity. Waterborne commerce accounts for approximately 69 percent of Chile's international trade, including 80 percent of exports and 50 percent of imports.

The Asociación Latino Americana de Integración¹ (ALADI) countries, the United States, the European Union, Japan, China, South Korea, and Taiwan account for the majority of Chile's sea trade. Asia is the top destination for Chilean exports by sea, followed by Europe. The EU is also Chile's largest source of imports by sea.

Chile's major exports by sea include copper and other minerals, forest products, chemicals, and agricultural products. On the import side, major import categories include fuels, grain, chemicals, and containerized cargo. Key trends that are expected to drive growth in Chilean imports/exports going forward including Chile's improving competitiveness in merchandise manufacture and exporting, the signing of new free trade agreements with the US and Europe, and the continued expansion of newly industrializing economies, particularly in Asia.

Chilean Trade Through the Panama Canal

The majority of Chilean trade that passes through the Panama Canal travels to/from the East Coast US, Europe, and East Coast South America/Central America. More than a quarter of Chile's sea imports/exports by weight transit the Canal. The East Coast US accounts for nearly half of Chile's Canal-relevant exports and nearly a third of its imports; Europe accounts for 30 percent of Chile's Canal-relevant exports and 23 percent of its imports.

Chile's overall sea export tons increased by 6 percent a year during the past decade, while exports through the Panama Canal increased by 7.8 percent per year. The most prominent exports by weight transiting the Canal include salt, container cargo, copper ore/metal, and fruit, which together represent nearly three-fourths of Chilean exports transiting the Canal.

Chile's imports through the Canal, on the other hand, decreased by an average 8 percent per year over the past decade, while total sea imports increased by 3 percent per year. The main reason for this difference in growth rates has been an increase in sea imports from South American and Asian countries that do not necessarily transit the Panama Canal. Container cargo, petroleum products, and fertilizers make up half of Chile's Canal-relevant imports.

Methodology for Canal-Relevant Commodity Analysis

For the purposes of this study, the ACP analyzed Chilean export commodities and import commodities, representing 80 percent of Chile'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 Chilean trade and Chile's economy.

¹ México, Cuba, Venezuela, Colombia, Ecuador, Perú, Bolivia, Paraguay, Uruguay, Argentina, Chile and Brazil.

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 Chile 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 Chilean imports and GDP.

Export Commodities Analysis

Overall, Panama Canal-relevant Chilean exports, including all containerized cargo, make up 27 percent of total Chilean merchandise exports.² As shown in Exhibit 1-1, the export commodities analyzed for this study represented approximately 23 percent of total Chilean merchandise export value in 2003.

Of the 13 commodities analyzed in this report, Canal exported quantities account for different shares of each commodity's total exports. In some cases, like salt and containerized maize, all of Chile's exported quantities are transported through the Panama Canal. In other cases, only 20-50 percent of that commodity's exports are transported through the Panama Canal, including copper metal, copper ore, fruit, and wood products.

² 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.

Exhibit 1-1

Canal-Relevant Chilean 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 Chile's Exports	5. Canal Transit Cost Share of CIF	6. 200% Toll Increase Impact on CIF
<i>Bulk</i>						
Salt	\$43.19	97.1%	\$44.50	0.2%	9.2%	14.2%
Copper metal	\$1,969.48	39.4%	\$5,001.06	9.5%	0.1%	0.2%
Copper ore	\$450.98	18.7%	\$2,410.36	2.2%	0.5%	0.8%
Fruit, refrigerated	\$466.50	29.2%	\$1,597.85	2.3%	1.0%	1.7%
Chemicals	\$24.85	1.4%	\$1,744.60	0.1%	1.4%	2.0%
Boards and planks	\$167.32	42.6%	\$393.05	0.8%	0.8%	1.2%
Pulpwood	\$41.21	4.6%	\$895.70	0.2%	1.0%	1.5%
Plywood and veneers	\$38.73	32.0%	\$121.21	0.2%	0.8%	1.2%
<i>Container</i>						
Wood products	\$589.45	48.2%	\$1,223.33	2.9%	0.6%	0.9%
Juice	\$69.67	28.7%	\$243.00	0.3%	0.4%	0.6%
Wine	\$315.70	46.6%	\$676.79	1.5%	0.2%	0.3%
Fruit	\$455.34	28.5%	\$1,597.85	2.2%	0.3%	0.5%
Maize seed	\$93.43	100.0%	\$93.43	0.5%	0.2%	0.3%

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 Chilean exports of each commodity, regardless of transportation mode or route
4. The percent of total Chilean 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

Only three Canal-relevant commodities are significant in relation to total Chilean exports: In 2003, total copper exports accounted for 35 percent of Chile's total exports, wood products exports accounted for 7 percent, and fruit accounted for 7 percent. The other analyzed commodities represent less than 4 percent of total exports each.

With the exception of salt, the Canal cost is not a significant portion of the CIF for any of the analyzed commodities; however, given the importance of copper, fruit, and wood to the Chilean economy, further analysis was carried out to understand the potential effects of an increase in Canal tolls on these commodities' demand.

- **Copper:** Copper exports transiting the Canal are about 9.8 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 the refined

copper CIF by only 0.22 percent and the copper ore CIF by 0.78 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 Chile will be delivering sufficient copper to meet demand.

- **Fruit:** Fruit exports transiting the Canal represent four percent of total exports. Fruit transits as bulk and in containers. If Canal tolls were increased by 200 percent, the bulk fruit CIF would increase by 1.69 percent and container fruit CIF by 0.45 percent. Chilean fruit transiting the Canal mainly competes with New Zealand fruit, which would also be affected by an increase in tolls. Additionally, most fruit travels on bulk reefer trade routes that are captive to the Canal and not sensitive to small toll increases.
- **Wood:** Wood exports transiting the Canal are a relatively small percentage of total exports. A 200 percent increase in Canal tolls would increase the CIF by a maximum of only 1.5 percent, due to the high value of wood products. For all wood products, the most critical factor for Chilean exports is demand growth from Asian countries, which is not relevant to the Canal.
- **Salt:** Nearly all Chilean 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 14.21 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 0.2 percent of total exports, so a toll increase would not material affect the Chilean economy.

Import Commodities Analysis

The import commodities analyzed in this study are shown in Exhibit 1-2. In 2003, Chilean imports transiting the Panama Canal accounted for 20.6 percent of Chile's total goods imports (valued in CIF terms). Additionally, imports transiting the Panama Canal represented only 5.5 percent of Chile's GDP in 2003.

In 2003, Chile's merchandise trade deficit (current account) was US\$3 billion, or 4.6 percent of GDP.³ An increase in import prices, due to an increase in Canal tolls, would have a nearly imperceptible impact on Chile's deficit and national income: Even if tolls were increased by 200 percent for all Chilean imports that transit the Canal, the cost of total goods imports would grow by 0.11 percent and national income would drop by only 0.03 percent, with little or no impact on inflation.

³ Banco Central de Chile.

Exhibit 1-2

Canal-Relevant Chilean Imports Analyzed

Commodity	Canal Share	Canal Transit Tons 2003	Average CIF/Ton	CIF Value of Canal Transit Tons (US\$M)
Coal	9%	481,969	\$ 38	\$ 18.13
Fertilizers, misc.	9%	541,842	\$ 202	\$ 109.22
Crude petroleum	7%	194,475	\$ 167	\$ 32.53
Corn	4%	52,293	\$ 109	\$ 5.68
Diesel oil	4%	167,229	\$ 249	\$ 41.57
Wheat	4%	261,956	\$ 175	\$ 45.85
Chemicals, misc.	3%	122,171	\$ 137	\$ 16.73
Iron and steel	2%	90,234	\$ 410	\$ 36.95
Gasoline	2%	47,934	\$ 261	\$ 12.53
Phosphates	2%	80,776	\$ 170	\$ 13.76
Liquefied gas	2%	17,266	\$ 111	\$ 1.91
Container cargo	33%	1,209,240	\$ 2,973	\$ 3,595.06
Other	19%			
Total CIF Value of Panama Canal Transit Tons (US\$M)				\$ 3,929.93

Source: ACP, 2003 US Waterborne Commerce imports and exports, DIRECTEMAR, Mercer analysis.

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 the economy of Chile, nor on the principal industries that provide Canal-relevant export commodities.

Finally, the larger question facing the Chilean 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 the Chilean economy of a deterioration in service – due to increased waiting 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 the Chilean 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 Chile'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 Chilean economy.

The overall objectives of this study were as follows:

- Generate a clear understanding of Chile maritime trade

- Review historical Canal transit data to determine principal imported and exported commodities from Chile
- Determine the relevance of this Canal-based traffic to Chile 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 the Canal cost increases on the Chilean economy
- Appraise the ability of different industries within Chile 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 Chilean economy, this report focuses on the highest-volume and highest-value imported and exported commodities that transit the Canal. The report assesses Chilean 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 Chile.

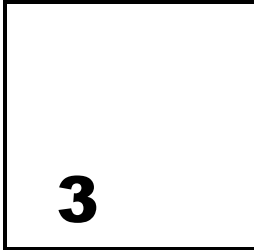
The analysis examines, for each commodity, the relevance of Canal-based traffic to overall country commodity imports and exports; the impact of transit cost increases on overall landed costs; the expected ability to pass on cost increases to end customers; and the overall impact on the country's economy.

The analysis involved the following work steps:

- *Overview of Chile maritime trade:* Development of a high-level description of current Chile sea trade, including commodities and main partners. This overview allowed the ACP to understand Chile's principal and alternative trade routes, the overall impact of the Panama Canal on shipping, and the impact of key commodity trades on the Chilean 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 Chilean 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 Chile:* Determined the possible economic impact of potential toll increases for Chile, based on the previous analyses, and assessed whether toll increases would have a significant impact on the Chilean 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.



Overview of Chile's Sea Trade

3.1 Imports and Exports

Chile is one of South America's strongest economies, with a GDP of US \$89 billion in 2004 and an annual compound growth rate of 2 percent since 1996 in current prices. More than half of Chile's traded goods and services are sourced from international trade (exports and imports) and Chile has been active in developing trade agreements with its main partners. Chile's significant increase in GDP can be contributed to its strong trading relationships.

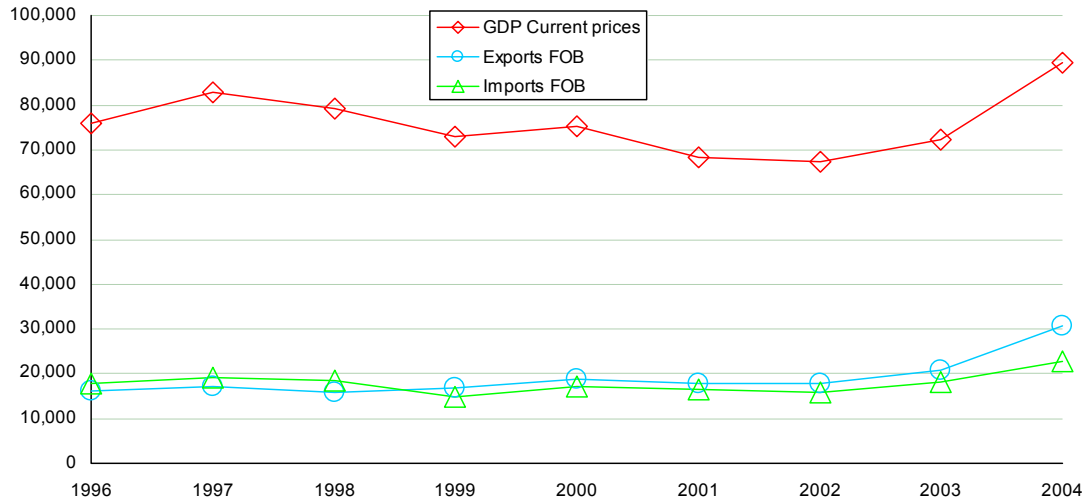
Chile's total international trade grew by an annual compound rate of 2 percent during 1996-2004, while exports grew by 8.4 percent and imports by 3.1 percent (FOB prices) over the same period. Chile has seen, however, some annual downward shifts during this period, which reflect various regional economic crises (such as Argentina in 2002) (Exhibit 3-1).

Chile's trade balance has been positive since 1998 and in 2004, Chile registered its largest positive trade balance in 10 years, of approximately \$8 million (FOB). Chile is highly dependent on exports for continued growth, as its internal consumption rate is lower than its production capacity.

Additionally, since 1998, the share of exports with respect to GDP has grown steadily, with a particularly sharp jump in the last two years (2002-2004) (Exhibit 3-2). This confirms the trend that exports will have an increasingly important role in the Chilean economy in the near future.

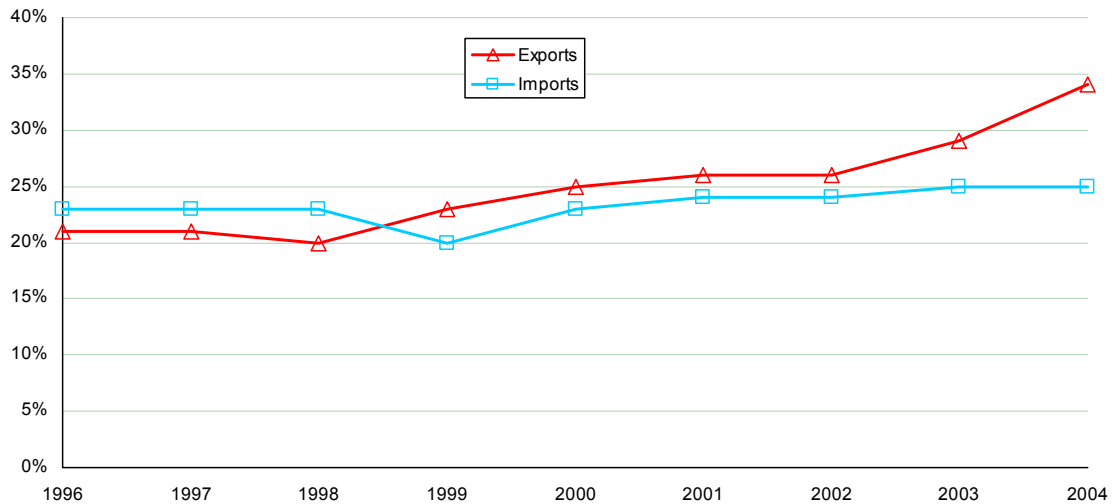
Chile's year over year imports and exports are sensitive to regional economic crises, such as the Argentina crisis in 2002. Its exports and imports have not only rebounded however but surpassed the annual levels of the past decade.

Exhibit 3-1
Chilean Trade and GDP Relationship: 1996-2004
 (US\$ millions, current prices)



Source: Banco Central de Chile and Asociación Latinoamericana de Integración.

Exhibit 3-2
Chilean Trade as a Percentage of GDP: 1996-2004
 (percent of trade in US dollars)



Source: Banco Central de Chile and Asociación Latinoamericana de Integración.

While Chile's total trade has grown by 2 percent a year on average, sea trade has grown more slowly, by 1.6 percent year during 1999-2004. Sea trade accounts for 69 percent of

total trade on average (Exhibit 3-3). Chile's remaining trade moves mainly by air, truck and rail, due to the high volumes traded with neighboring countries like Argentina.

Chilean sea exports have grown steadily throughout the 1996-2003 period, accounting for more than 80 percent of total exports. Sea imports are currently recovering from a major downward shift during 1999-2001 and account for approximately 50 percent of total imports. The value "spread" between sea trade exports and imports is also higher than for Chile's overall trade, due to dry bulk exports being replaced by higher-value manufactured goods moving in containers, a result of Chile's increasing industrialization (Exhibits 3-4 and 3-5).

Exhibit 3-3

Chilean Sea Trade as a Percentage of Total Trade: 1996-2003E
(percentage of US dollars)



Source: Dirección General del Territorio Marítimo y de Marina Mercante (Directemar), Banco Central de Chile, Mercer analysis.

Exhibit 3-4
Chilean Sea Trade: 1993-2002
 (million tons)

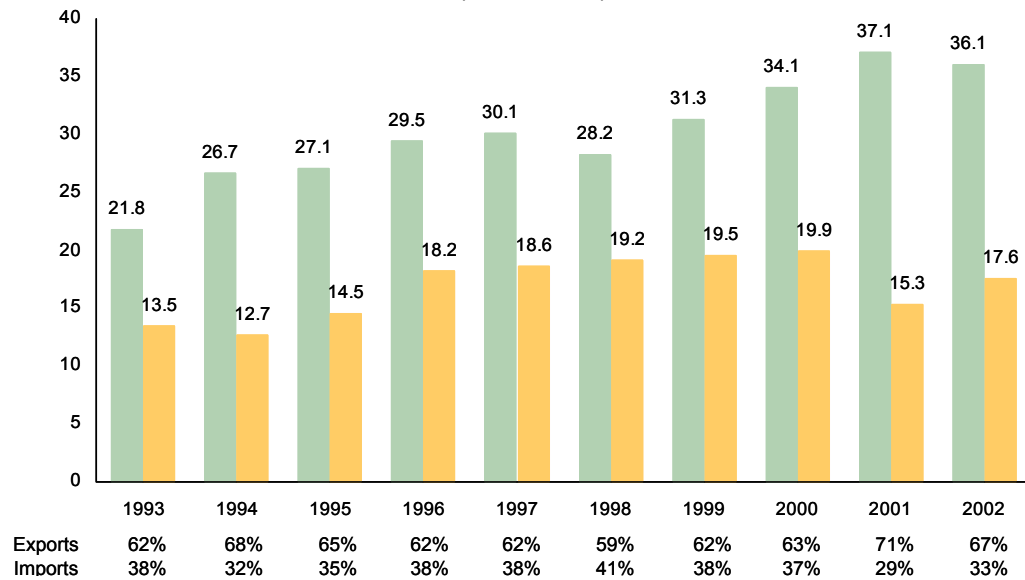
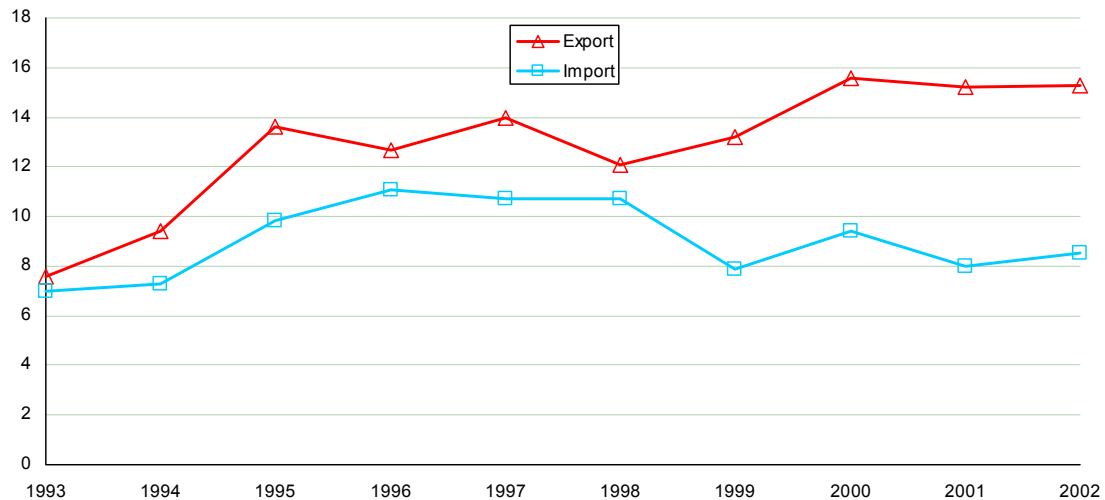


Exhibit 3-5
Chilean Sea Trade: 1993-2002
 (\$US millions)



Source: Dirección General del Territorio Marítimo y de Marina Mercante (DIRECTEMAR).

3.2 Key Trade Partners

Historically, Chile's major trade partners have been the Asociación Latino Americana de Integración⁴ (ALADI) countries, the United States (US), the European Union (EU),

⁴ México, Cuba, Venezuela, Colombia, Ecuador, Perú, Bolivia, Paraguay, Uruguay, Argentina, Chile and Brazil.

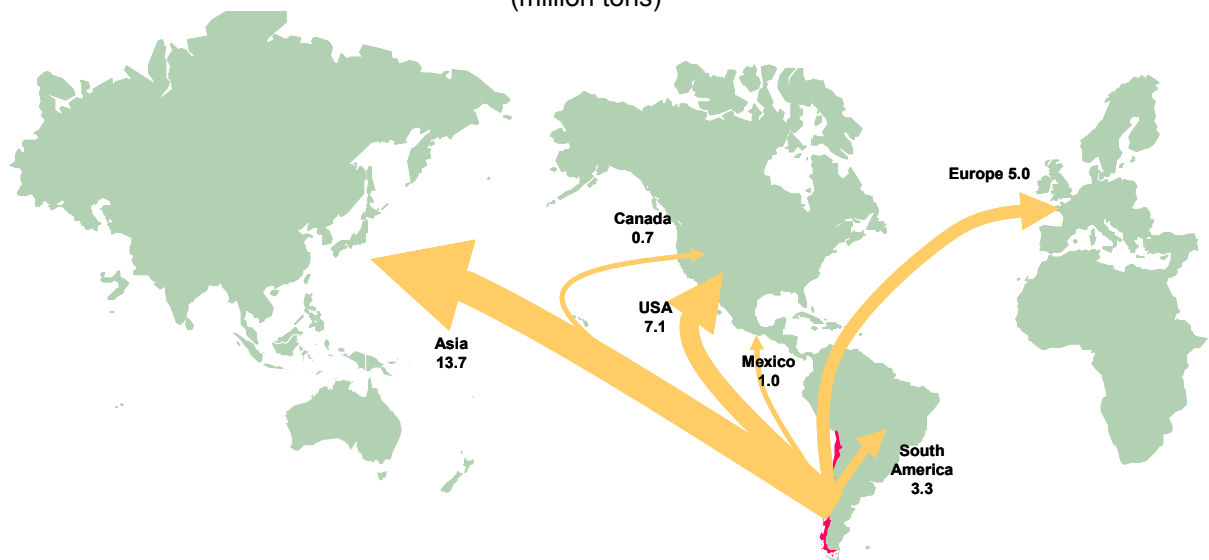
Japan, China (including Hong Kong), South Korea, and Taiwan. These countries and regions together account for more than 85 percent of Chile's sea exports.

In the last 15 years, Chile has developed various trade agreements which have been major drivers of economic growth. These agreements also have resulted in increased imports from geographies such as Europe and the US, with Chile decreasing its imports tax from 20 percent to 6 percent in 2003. Chile's major trade agreements are with the US, Canada, Mexico, EFTA (European Fair Trade Association), and MERCOSUR.⁵ Chile has also developed political and commercial associations with the European Union, its largest trade partner.

On the export side, Chile's geographic location allows for a very dynamic trade economy, with cargo moving by land to neighboring South American countries, and by sea or air to important economies such as the US, the EU, and Asia (Exhibit 3-6); these three regions accounted for 73 percent of Chile's exports, in value terms, in 2003.

Although Asia is the most important importer of Chilean goods by sea in tonnage terms, goods exported to Europe have an FOB value per ton 2.5 times higher, as Europe imports far more high value containerized goods from Chile (Exhibit 3-7).

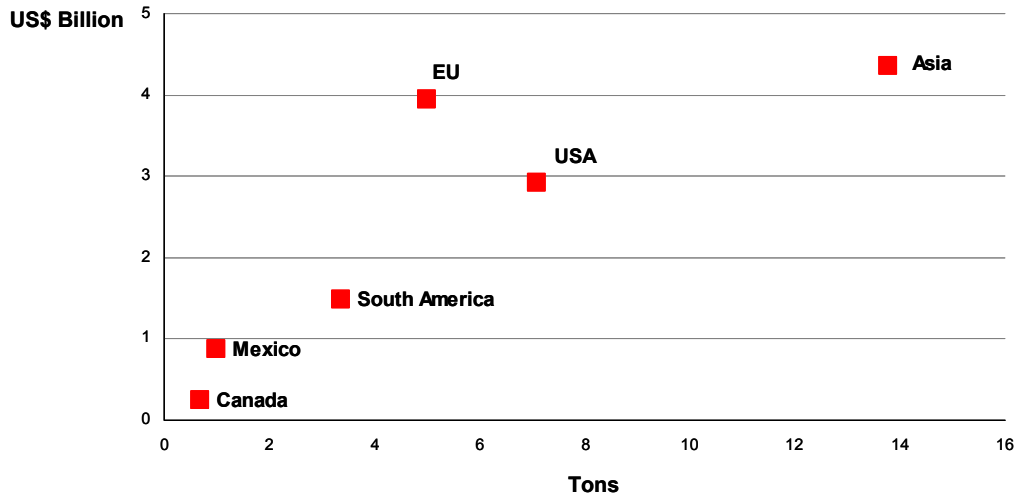
Exhibit 3-6
Major Destinations for Chilean Sea Exports: 2002
(million tons)



Source: Dirección General del Territorio Marítimo y de Marina Mercante (DIRECTEMAR).

⁵ Argentina, Brazil, Paraguay, Uruguay.

Exhibit 3-7
2002 Chilean Sea Exports: Tonnage vs. Value to Major Partners



Source: Dirección General del Territorio Marítimo y de Marina Mercante (DIRECTEMAR).

On the import side, sea trade also plays a very significant role, as 60 percent of Chile’s imports move by sea; the remaining are mainly air and land imports. In terms of tonnage, the most important sea import partners for Chile are Argentina, the US, Brazil, Australia and Peru. However, in value terms (FOB), Chile’s sources of higher-value commodities include Asia (China, Japan, Korea and Taiwan), the US, and the EU. The regions described in Exhibit 3-8 account for 81 percent of the Chilean sea imports in tonnage terms.

Exhibit 3-8
Major Sources for Chilean Sea Imports: 2002
 (million tons)



Source: Dirección General del Territorio Marítimo y de Marina Mercante (DIRECTEMAR).

Region-Specific Sea Trade Partners

Asia

Asia (China, Japan, Korea, and Taiwan) is Chile's top export partner, accounting for 26 percent of the value of total exports. Chile's exports to Asian countries consist mainly of ores, copper, pulpwood, and fish products. Given the growth of Chinese consumption and production capabilities, the importance of Asia as an export partner is expected to continue growing in the near future and even shifting demand for some products from the US or Europe to Asia (and mainly China).

European Union

The EU is the largest source of imports by sea and second largest exporter from Chile. The EU accounts for 25 percent of Chile's exports in value terms. During the past decade, Chilean exports to the EU primarily have consisted of manufactured products, minerals, and agricultural products (e.g., fruit). Minerals and manufactured products, which now account for 90 percent of exports, gained share over the period versus agricultural products.

During 1993-2003, Chile's imports from the EU varied significantly year to year, but since the signing of the Chile-EU trade agreement in 2003, Chilean imports from the EU have increased. Manufactured goods account for nearly all of the EU's imports to Chile.

United States

The US is the third largest importer of Chilean goods overall and by sea. The US imports mainly fruit, fish, wood related articles, copper, and wine from Chile; these goods account for 70 percent of total Chilean exports to the US. Furthermore, more than 85 percent of Chile's sea exports to the US are containerized cargo, dry bulk, and liquid bulk.

ALADI (Asociación Latino Americana de Integración)

Chile's fourth most important sea export destinations are the South American countries that make up ALADI; this region is also its top source of overall imports (40 percent share in 2004).

Although South America has more than 500 million potential consumers, it remains economically unstable. This can be seen in high year to year trade variances in comparison to stable trade patterns with regions like the EU. However, the different trade agreements between Chile and the ALADI countries and other regional association agreements, such as MERCOSUR, are expected to be important drivers of growth.

Additionally, these countries have historically been dependent on interregional trade, given the differing resources available in each country.

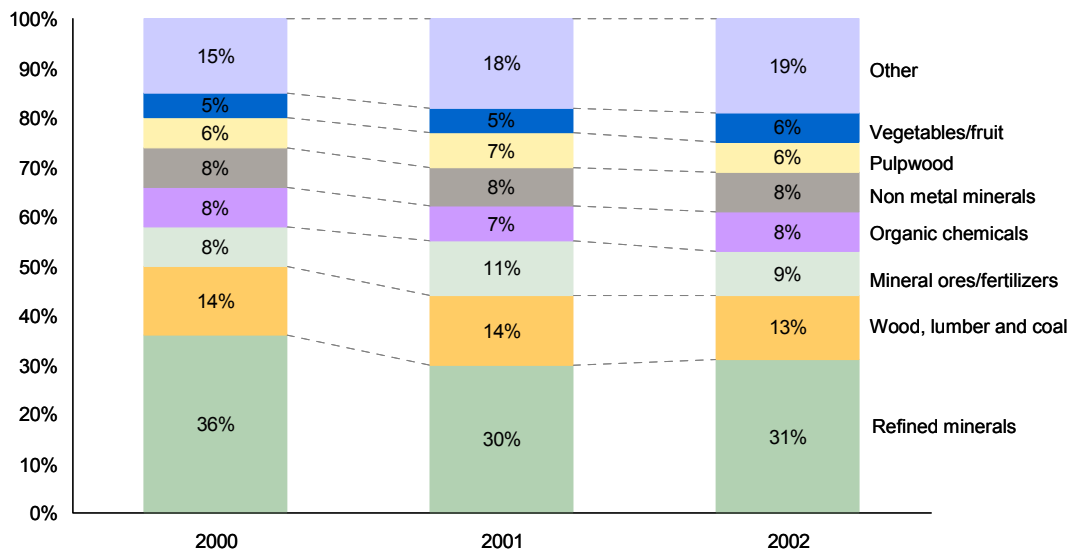
During the 1990s, Chilean exports to the ALADI countries shifted significantly away from raw goods and toward manufactured products. This trend continues today, with manufactured products accounting for more than 70 percent of Chile’s exports to ALADI. Minerals account for an additional 15 percent.

3.3 Key Trade Commodities

Major Chilean sea exports fall into seven commodity categories: refined minerals (copper), ore minerals, wood products (boards and plywood), organic chemicals, non-metal minerals (salt), pulpwood, and vegetables and fruits. From 2000-2002, these seven categories accounted for approximately 80 percent of total sea exports in tons and around 70 percent of sea exports in FOB value (Exhibits 3-9 and 3-10).

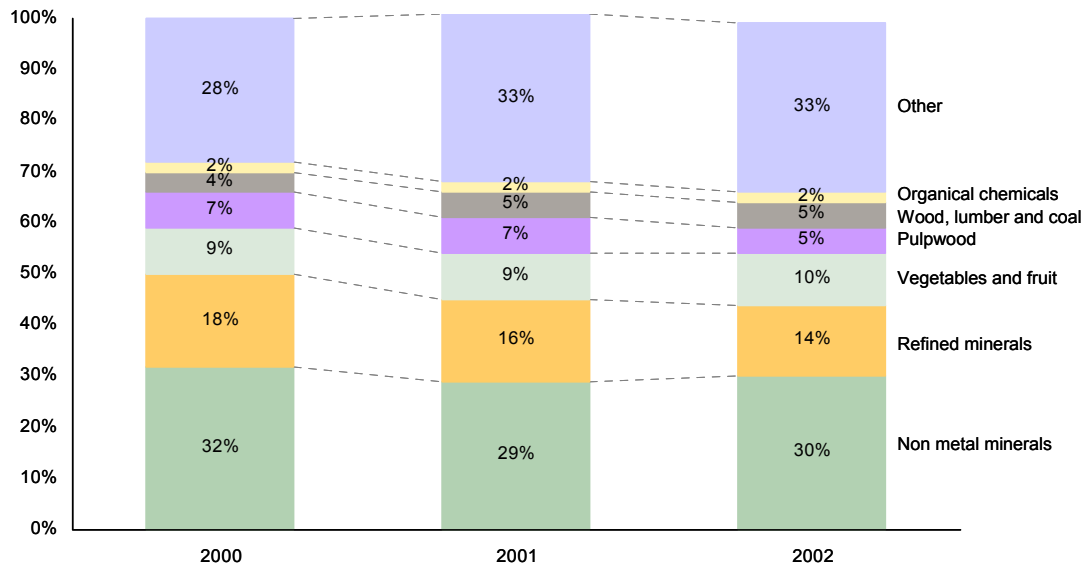
In transport terms, general cargo and liquid bulk have both gained share during the past decade, while refrigerated (reefer) cargo has remained stable and dry bulk has slipped (Exhibit 3-11).

Exhibit 3-9
Chilean Sea Exports by Weight: 2000-2002
 (percentage of tons)



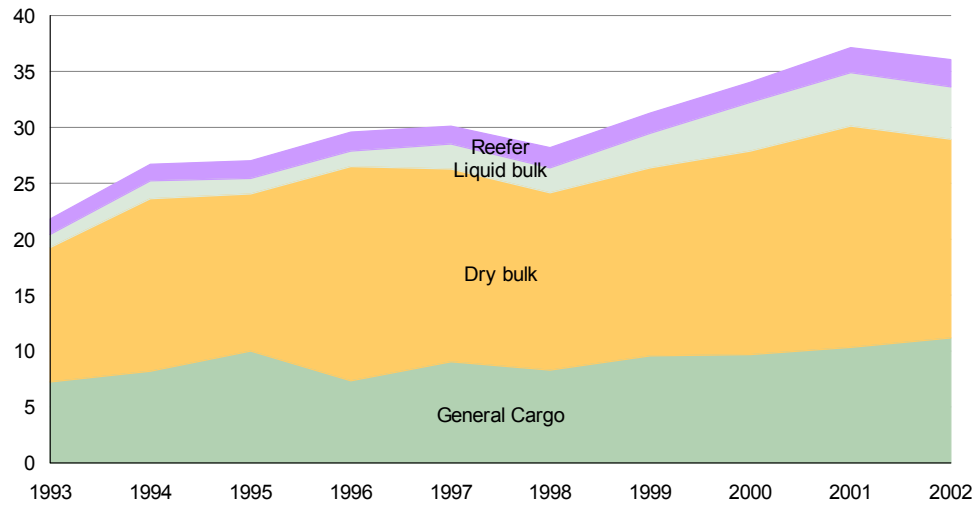
Source: ECLAC Economic Commission for Latin America and the Caribbean.

Exhibit 3-10
Chilean Sea Exports by Value: 2000-2002
 (percentage of US dollars)



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

Exhibit 3-11
Chilean Sea Exports by Cargo Type: 1993-2003
 (million tons)



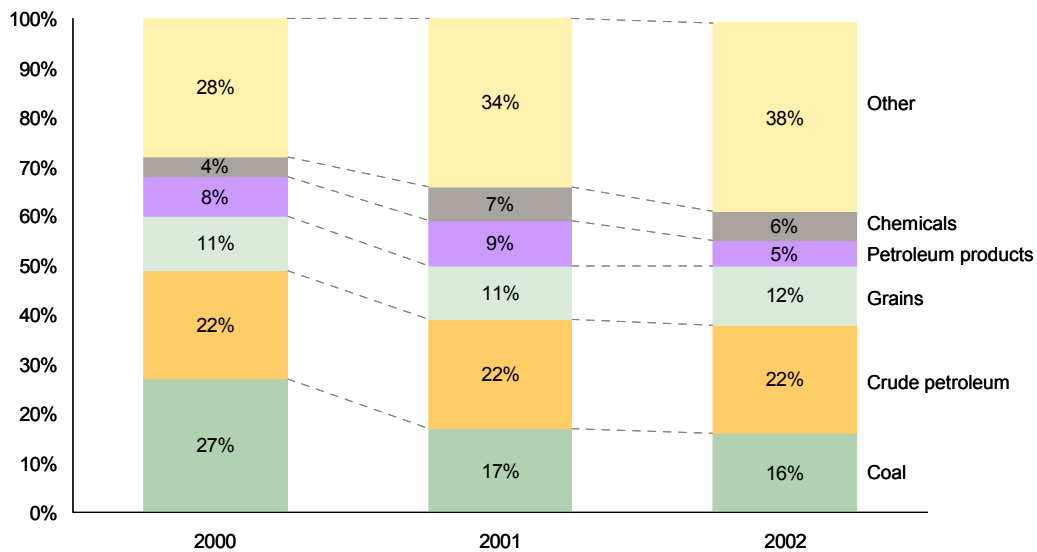
Source: Dirección General del Territorio Marítimo y de Marina Mercante (DIRECTEMAR).

On the import side, Chile's sea imports are highly fragmented; however, five major commodity categories were identified in terms of tonnage: coal, crude petroleum, grain (wheat and corn), petroleum products, and chemicals. These commodities represent 70 percent of total sea imports in tons (Exhibit 3-12). During 2000-2002, bulk product imports have decreased in share, while containerized cargo imports have grown (this can

be seen in Exhibit 3-12, where the “Other” category, which is primarily containerized cargo, has increased in share). In terms of FOB value, major bulk commodities represent only 14 percent of total sea imports (Exhibit 3-13).

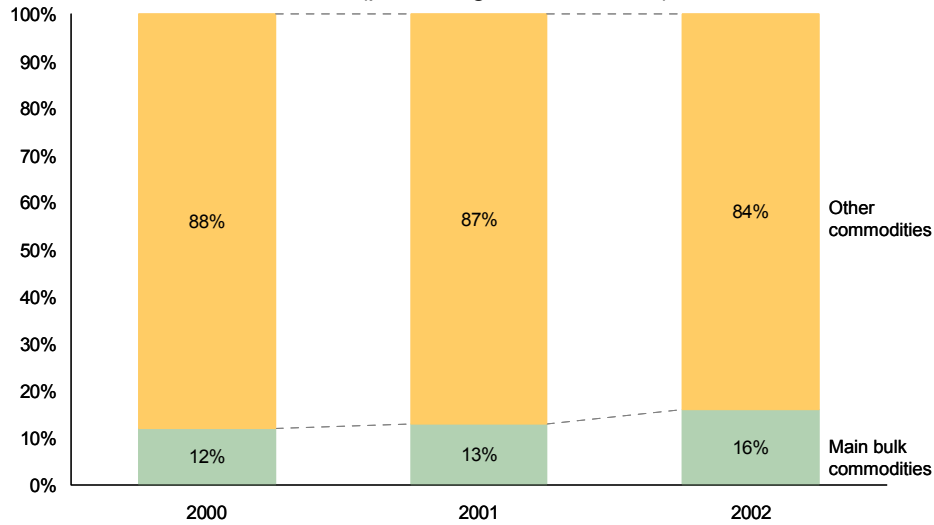
In transport terms, all import categories have just recovered from the Argentinean crisis in 2001. Liquid bulk and dry bulk still account for around 77 percent of total imports by weight, which is consistent with the major imported products such as coal or petroleum (Exhibit 3-14).

Exhibit 3-12
Chilean Sea Imports by Weight: 2000-2002
 (percentage of tons)



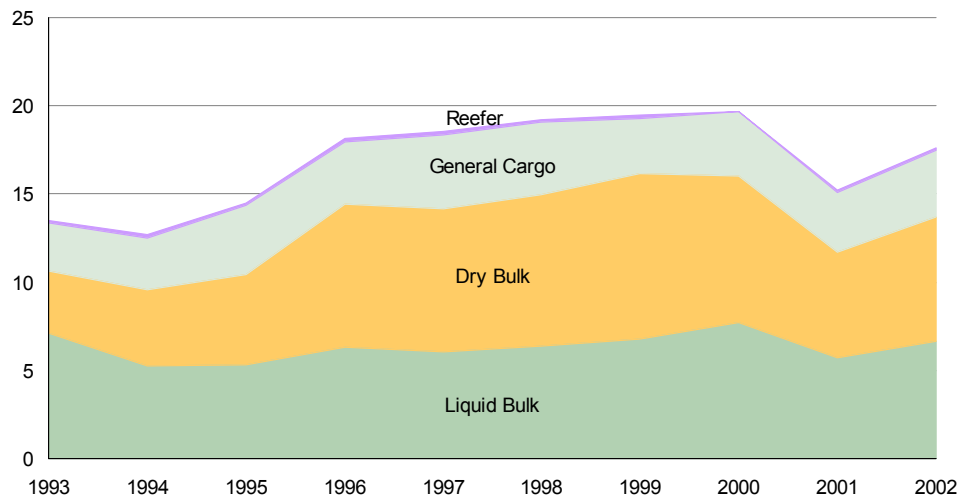
Source: ECLAC Economic Commission for Latin America and the Caribbean, DIRECTEMAR

Exhibit 3-13
Chilean Sea Imports by Value: 2000-2002
 (percentage of US dollars)



Source: ECLAC Economic Commission for Latin America and the Caribbean, DIRECTEMAR.
 Note: Main bulk commodities: coal, crude petroleum, grains, petroleum products and chemicals.

Exhibit 3-14
Chilean Sea Imports by Cargo Type: 1993-2003
 (million tons)



Source: DIRECTEMAR.

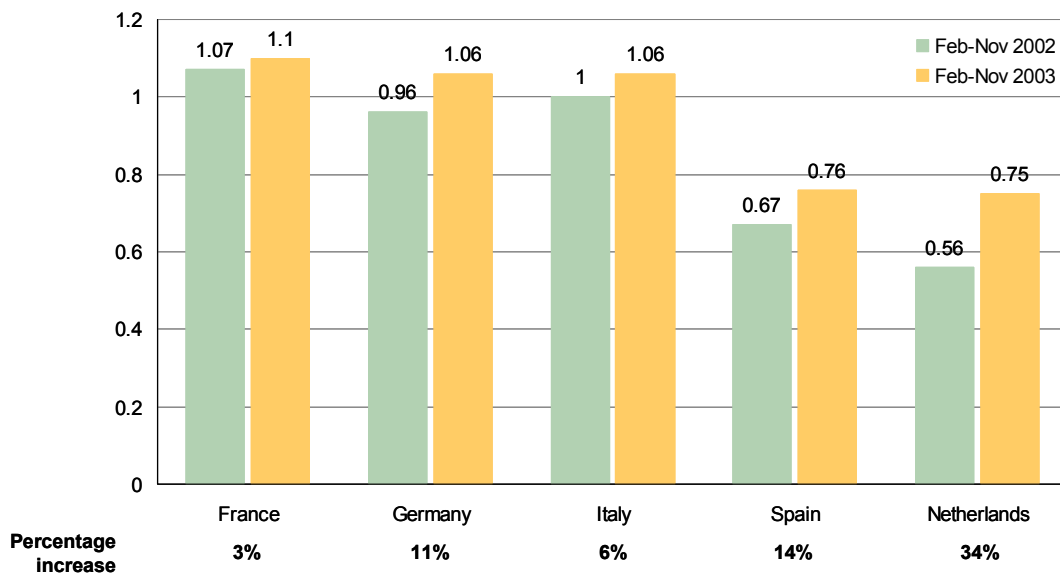
3.4 Chile Market Trends and Challenges

Key import/export trends that are expected to play a role in Chilean trade going forward including improving competitiveness in merchandise manufacture and exports. In 2002, the Chilean government developed the Pro-Growth Agenda with the Manufacturers' Association, which includes different measures to improve competitiveness, technology, and tax measures to increase foreign investment. In addition, Chile has adopted a number

of internal policies to increase and promote exports, such as a diversification of trade partners, judicial stability for foreign investors, and a flexible exchange rate since 1999.

Chile is an important player on the world trade market, specifically for certain commodities such as copper. Many countries now depend on Chilean products, and as a result, Chile has been active in promoting its exports sectors. In the last decade, Chile has developed and implemented several Free Trade Agreements with countries or regions such as the US and the European Union which have proven to be beneficial both for Chilean exports and imports. For example, in the first eleven months after the signature of the FTA between Chile and the EU, exports to the EU increased by 14 percent and imports by 10 percent, while total trade with some EU member states such as the Netherlands increased by 34 percent (Exhibit 3-15). Additionally, continuing economic expansion in both developed and newly industrializing countries, particularly in Asia, should foster Chilean exports of traditional commodities and raw materials.

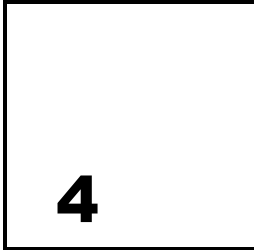
Exhibit 3-15
Total Trade between Chile and Key EU Countries: 2002-2003
 (US\$ billions)



Source: Servicio Nacional de Aduanas de Chile.

Infrastructure development will be critical if Chile is to continue to grow its trade, particularly with regard to ports and roads. Chile has begun the transference of dock and road operations from the state sector to private companies, which are expected to better meet the quality and efficiency standards needed to handle increasing exports and imports.

Additionally, Chile also faces challenges with respect to its export commodity mix. Chile's exports are highly dependent on natural resources, and it is uncertain if this commodity mix will be sufficient to sustain growth into the future.



Chile and the Panama Canal

4.1 Trade Routes Relevant to the Panama Canal

Given Chile's geographical location, not all countries and trade routes are relevant to the Panama Canal. Based on ACP data, the Canal relevant trade lanes for Chilean exports are the East Coast of the US (ECUS), Europe, East Coast Central America (ECCA), East Coast South America (ECSA) and East Coast Canada (ECCAN) (Exhibit 4-1).

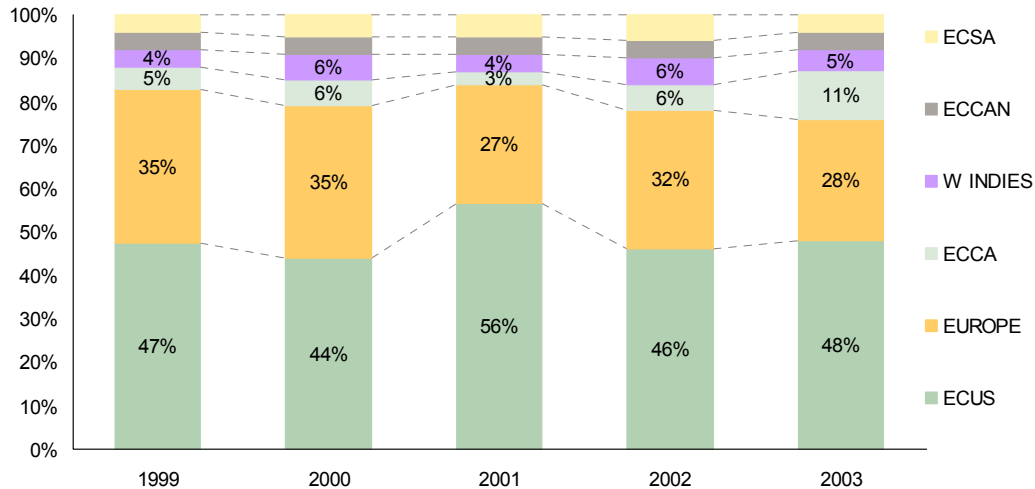
Exhibit 4-1
Panama Canal-Relevant Export Trade Routes for Chile: 2003
(million tons)



Source: Panama Canal Authority (ACP).

Chile’s Canal-relevant exports were 12.9 million tons in 2003, or around 28 percent of Chile’s total sea exports.⁶ Of this, 30 percent of Chile’s sea exports move through the Canal. Exports between Chile and the East Coast of the US account for almost half of Chile’s Canal-relevant exports. Since 2001, Chile’s trade through the Canal has grown for East Coast Central America while shrinking for the East Coast US (Exhibit 4-2).

Exhibit 4-2
Canal Relevant Export Trade Routes for Chile: 1999-2003
 (percentage of tons)



Source: Panama Canal Authority (ACP).

Canal-relevant imports trade lanes for Chile are the East Coast US (32 percent), East Coast South America (mainly Colombia and Venezuela with 25 percent share), Europe (Belgium, Germany, Spain, and the Netherlands with 23 percent share) and East Coast Central America (mainly Panama, with 10 percent) (Exhibits 4-3 and 4-4). Imports from Chile to the East Coast US, East Coast South America, and Europe accounted for 80 percent Chile’s Canal-relevant imports in 2003.

Chile’s Canal relevant imports were 4.7 million tons in 2003, or around 14 percent of Chile’s total imports. Twenty-six percent of Chile’s sea imports move through the Canal.

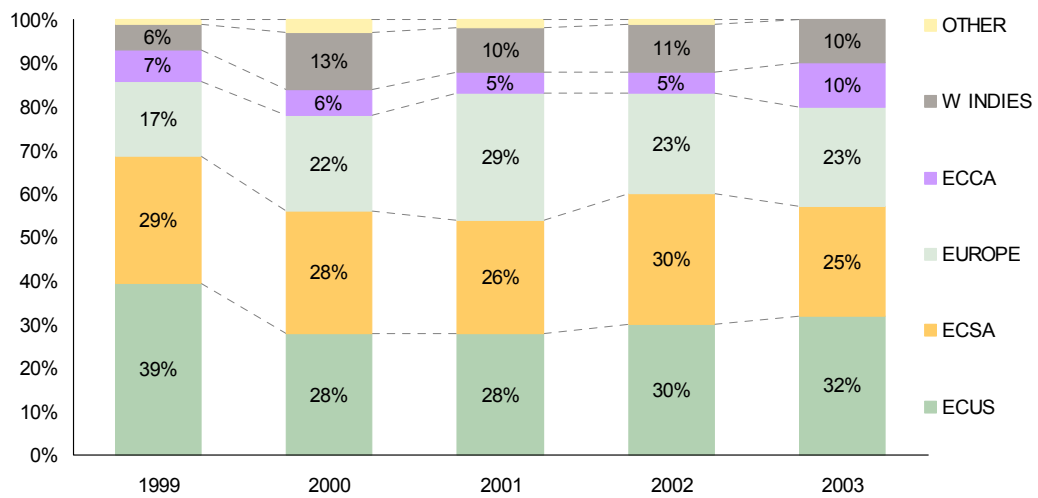
⁶ DIRECTEMAR.

Exhibit 4-3
Panama Canal-Relevant Import Trade Routes for Chile: 2003
 (million tons)



Source: Panama Canal Authority (ACP).

Exhibit 4-4
Canal-Relevant Import Trade Routes for Chile: 1999-2003
 (percentage of tons)



Source: Panama Canal Authority (ACP).

East Coast United States

The East Coast of the United States (ECUS) is by far Chile's largest partner for trade through the Canal, particularly on the export side, taking 48 percent of Chilean exports that transit the Canal.

Salt accounts for nearly half of the tonnage that transits the Canal from Chile to ECUS, followed by containerized cargo with a 12 percent share, petroleum products with 10 percent, fruit with 6 percent, copper with 6 percent, and fertilizers with 4 percent.

ECUS accounts for 32 percent of import tonnage to Chile that transits the Canal. One-quarter of this import tonnage is containerized cargo, and another quarter corn and wheat.

Europe

Europe includes the EU-15 countries and other Western and Eastern European countries, such as Turkey. Around 30 percent of Chile's exports that transit the Canal are bound for Europe and around 23 percent of Canal-relevant Chilean imports originate in Europe.

With respect to exports, copper accounts for 45 percent of the tonnage that transits the Canal from Chile to Europe. Other Canal-relevant Chilean export cargo types or commodities are containerized cargo with a 15 percent share, fruit with 9 percent, salt with 3 percent, and other chemicals with 2 percent; refrigerated cargo accounts for most of the remainder.

Chilean imports from Europe are highly fragmented. Containerized cargo accounts for 25 percent of the tonnage that transits the Canal from Europe to Chile; the next most relevant commodities in this trade lane are fertilizers, iron and steel, chemicals, and grains.

East Coast Central America

The East Coast of Central America (ECCA) is the third largest Canal-relevant trade lane for Chilean exports and the fourth with respect to imports. For the purposes of this study, Mexico was included in ECCA, in addition to Panama, Guatemala, and Cost Rica, which are the most relevant countries in this region.

With respect to exports, containerized cargo accounts for 30 percent of the tonnage that transits the Canal from Chile to ECCA, with boards and planks accounting for 20 percent, refined copper for 11 percent, and miscellaneous refrigerated cargo for 10 percent.

Chilean Canal-relevant imports from ECCA include containerized cargo, accounting for 53 percent of tonnage, fertilizers (22 percent), and phosphates (11 percent).

East Coast South America

The East Coast of South America (ECSA) includes Argentina, Brazil, Colombia, Uruguay, Venezuela, Guyana, and Surinam. Venezuela, Colombia and Brazil are the largest Canal users within this trade lane.

For exports, containerized cargo accounts for 60 percent of the tonnage that transits the Canal from Chile to ECSA, miscellaneous refrigerated cargo accounts for 10 percent, and pulpwood for 7 percent.

Chile Canal-relevant imports from ECSA include coal (31 percent of tonnage), crude petroleum (25 percent), and containerized cargo (17 percent).

East Coast Canada

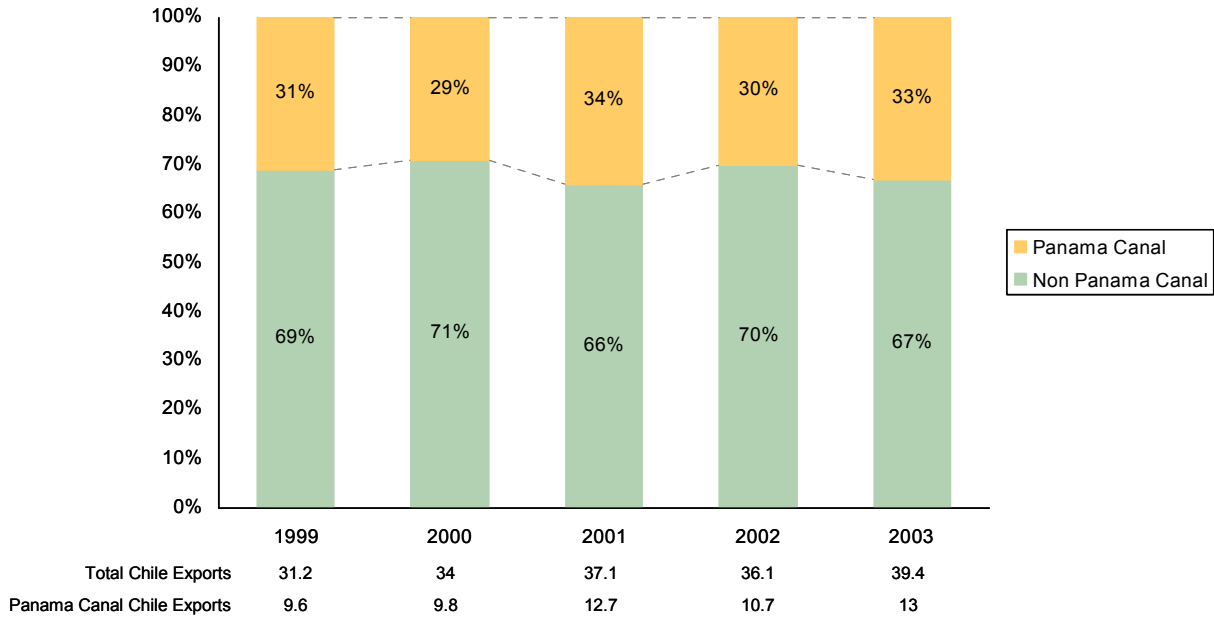
The East Coast of Canada is significant as a market for Chilean exports only with respect to the Canal. Salt and copper each account for 47 of the tonnage in this trade lane.

4.2 Chilean Imports/Exports through the Canal

During 1993-2003, Chile's exports through the Canal were relatively stable, averaging 31 percent of its total sea exports (Exhibit 4-5). While Chile's overall sea exports have increased by 6 percent a year during the period, exports through the Panama Canal have increased by 7.8 percent.

Chile's exports through the Panama Canal seem highly sensitive to factors that would cause a decrease in total sea exports, such as the regional crisis in Argentina in 2001. From 2001 to 2002, for example, Chile's total sea trade decreased by 3 percent, while its exports through the Canal decreased by 16 percent.

Exhibit 4-5
Chilean Exports through Panama Canal: 1993-2003
 (percentage of tons)



Source: Autoridad del Canal de Panamá (ACP), DIRECTEMAR.

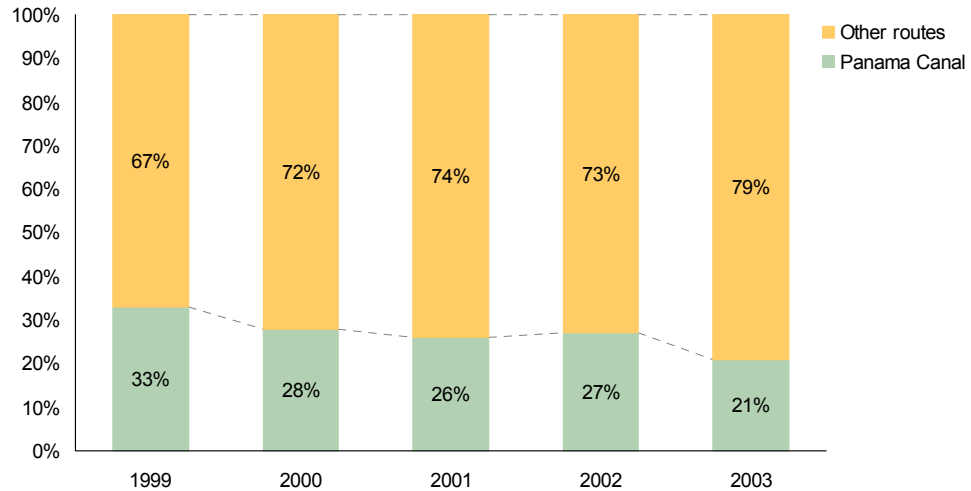
During 1993-2003, Chile’s imports through the Canal decreased by an average 8 percent per year, while total sea imports increased by 3 percent over the same period. The main reason for this difference in growth rates has been an increase in sea imports from South American and Asian countries that do not necessarily transit the Panama Canal (Exhibit 4-6).

Chile’s imports through the Panama Canal follow the same pattern as exports in terms of sensitivity to factors that would cause a decrease in total sea imports. From 2001 to 2002, mainly due to the crisis in Argentina, Chile’s total sea imports decreased by 23 percent, while its imports through the Canal decreased by 28 percent.

For the purposes of this report, when analyzing specific Chilean trade commodities that transit the Panama Canal, we used the “80/20 rule,” which means that we analyzed the most prevalent commodities making up approximately 80 percent of Panama Canal tonnage.

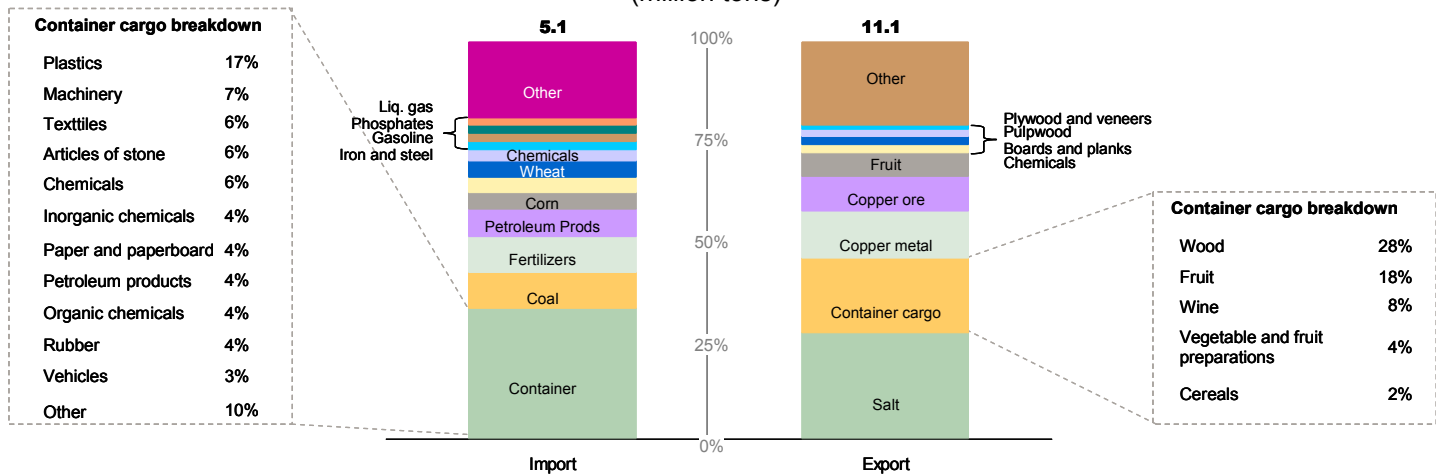
Based on this framework, the key commodities transiting the Canal are shown in Exhibit 4-7. Containers and dry bulk are the most important types of cargo transiting the Panama Canal.

Exhibit 4-6
Chilean Imports through Panama Canal: 1993-2003
 (percentage of tons)



Source: Autoridad del Canal de Panamá (ACP), DIRECTEMAR.

Exhibit 4-7
5 Year Average Chile Relevant Panama Canal Trade
 (million tons)



Source: Autoridad del Canal de Panamá (ACP).

4.3 Canal-Relevant Chilean Export Commodities

4.3.1 Copper

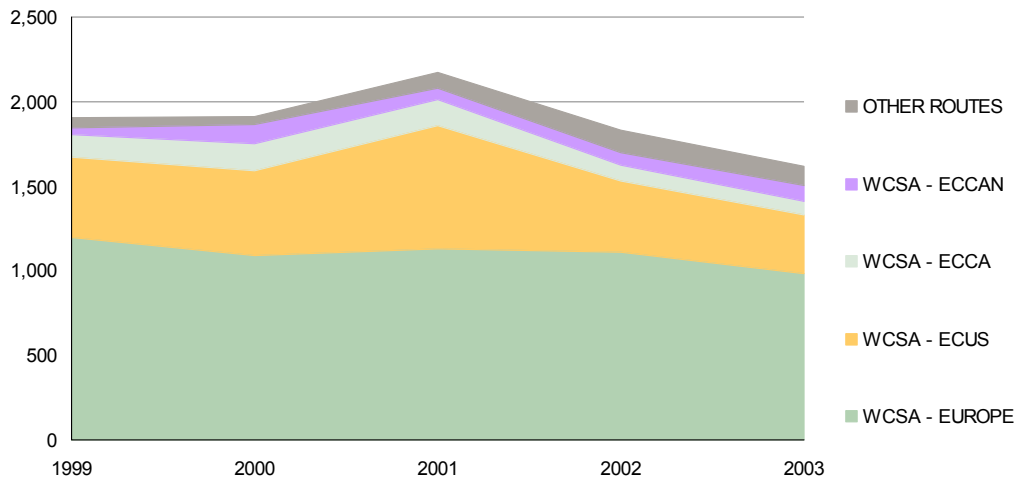
Copper is used in building construction, electronics and electronic products, transportation, industrial machinery, and consumer and general products. All end-use demand is for refined copper; concentrates are refined either in the exporting or importing country.

Chile is the world’s leading copper producer; together with neighboring Peru, it accounts for 40 percent of global production. Indonesia and the US are the next largest producers. The US is not an exporter, however, because its internal production does not satisfy its demand.

The copper trade through the Canal is categorized as copper ore or 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). West Coast South America is essentially the only origin region for both the copper ore and refined copper that transits the Canal, accounting for 98 percent of the refined copper and 91 percent of the copper ore transiting the Canal.

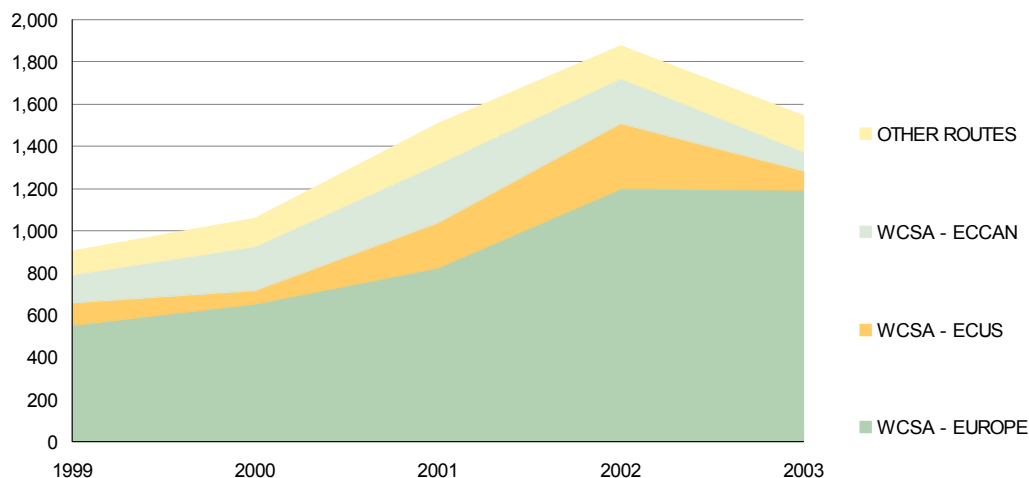
- For refined copper, the major trade lanes are WCSA (mainly Chile and Peru) to Europe, accounting for 61 percent of refined copper volume moving through the Canal in 2003, and WCSA to ECUS, which accounted for 22 percent of this volume in 2003 (Exhibit 4-8).
- For copper ore, the major trade lanes are WCSA (mainly Chile and Peru) to Europe, which accounted for 77 percent of copper ore Canal volume in 2003, and WCSA to ECUS and ECCAN, each of which accounted for 6 percent of copper ore Canal volume in 2003 (Exhibit 4-9).

Exhibit 4-8
Panama Canal Refined Copper Traffic: 1999-2003
 (000 tons)



Source: Autoridad del Canal de Panama (ACP).

Exhibit 4-9
Panama Canal Copper Ore Traffic: 1999-2003
 (000 tons)



Source: Autoridad del Canal de Panama.

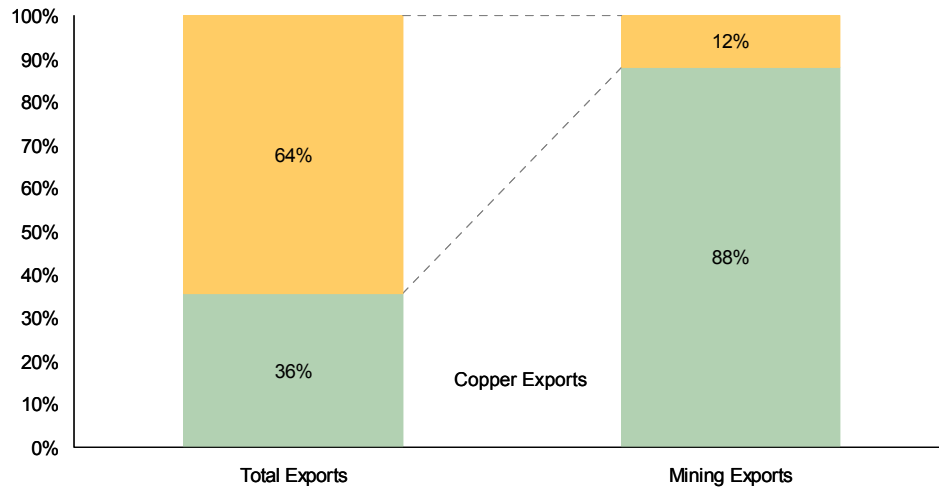
Mining is Chile’s most important primary production sector; accounting for around 7 percent of GDP during 1996-2003 (in 1996 constant pesos). Copper is Chile’s top mining product, and accounts for 88 percent of Chile’s mining product exports and 36 percent of total merchandise exports (Exhibit 4-10).

State-owned Codelco is one of Chile’s largest copper producers, producing 74 percent of the country’s copper in 2003 compared to 33 percent in 2002. Codelco sells 17 percent of its copper to China, followed by the US, France, and South Korea for another 30 percent.

Prior to the 1990s, Codelco had the monopoly on all mining prospects in Chile – however interest from foreign investors has led to Codelco entering several joint ventures. Other important producers are BHP Billiton and Anglo American. Several expansion projects are being developed, at a cost of more than US\$1 billion, clearly indicating that Chile will remain a major producer and exporter of copper to the world.

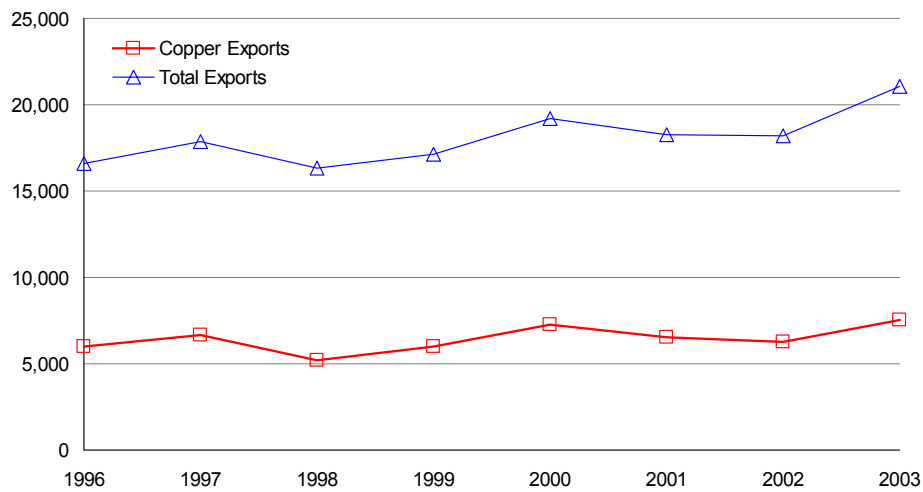
Given that copper is Chile’s most important export commodity, the total exports pattern is highly correlated with copper exports, as seen in Exhibit 4-11 (correlation coefficient for these two values is 0.85), thus indicating that both copper and total exports are dependent on the same underlying factors.

Exhibit 4-10
Chilean Copper Exports Share of Total and Mining Exports: 2003
 (US\$ billions)



Source: Banco Central de Chile.

Exhibit 4-11
Chile's Copper Exports and Total Exports: 1996-2003
 (US\$ millions)



Source: Banco Central de Chile.

4.3.2 Fruit

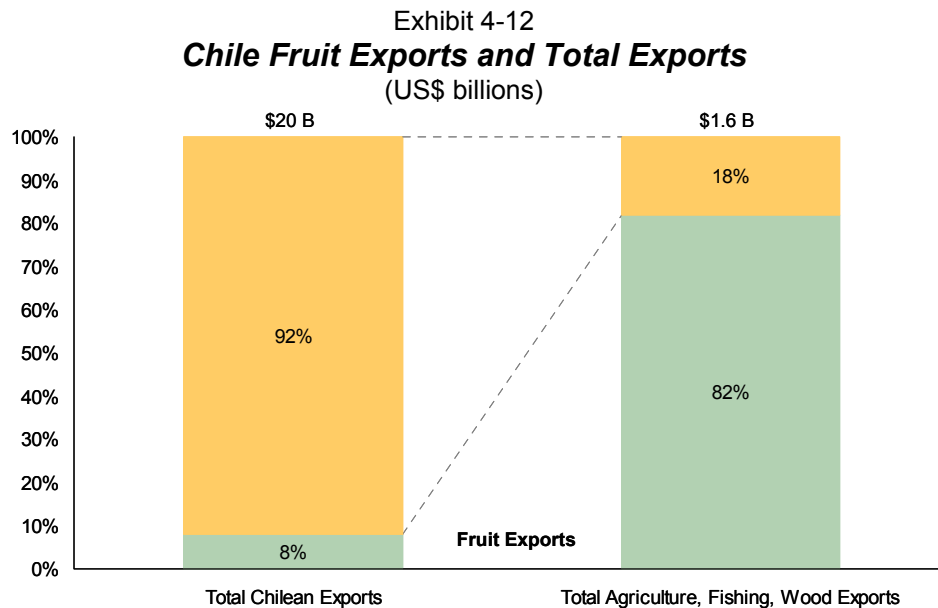
In general fruit is used either for personal consumption or as a raw material for the production of other food products. The world's largest fruit producers and exporters are

the US, Spain, Italy, Belgium, and France; Chile is the seventh most important fruit exporter, accounting for 4.7 percent of world fruit exports in 2003.⁷

Fruit trade through the Canal is mainly categorized as refrigerated fruit. Around 70 percent of the refrigerated fruit that transits the Canal originates in Chile, and 22 percent in New Zealand. Of the refrigerated fruit that transits the Canal, 54 percent is destined for the US and 41 percent for Europe; the main trade lanes for Chilean refrigerated fruit are to the East Coast US and Europe.

Fruit exports account for 80 percent of total Chilean exports in the agriculture, fishing and wood category and represent 8 percent of total Chilean exports, as seen in Exhibit 4-12. Sea exports account for 85 percent of total Chilean fruit exports.

In particular Chile exports grapes, apples, peaches, pears, and kiwis. Grapes and apples are the most important Chilean fruit export products, accounting for 20 and 45 percent of fruit exports, respectively.⁸



Source: Banco Central de Chile.

4.3.3 Chemicals

Major chemicals included in the ACP’s chemical group include sodium hydroxide (caustic soda), benzene, ethanol, styrene, MBTE, methanol, toluene, ethylene glycol, ethanol, and phenol.

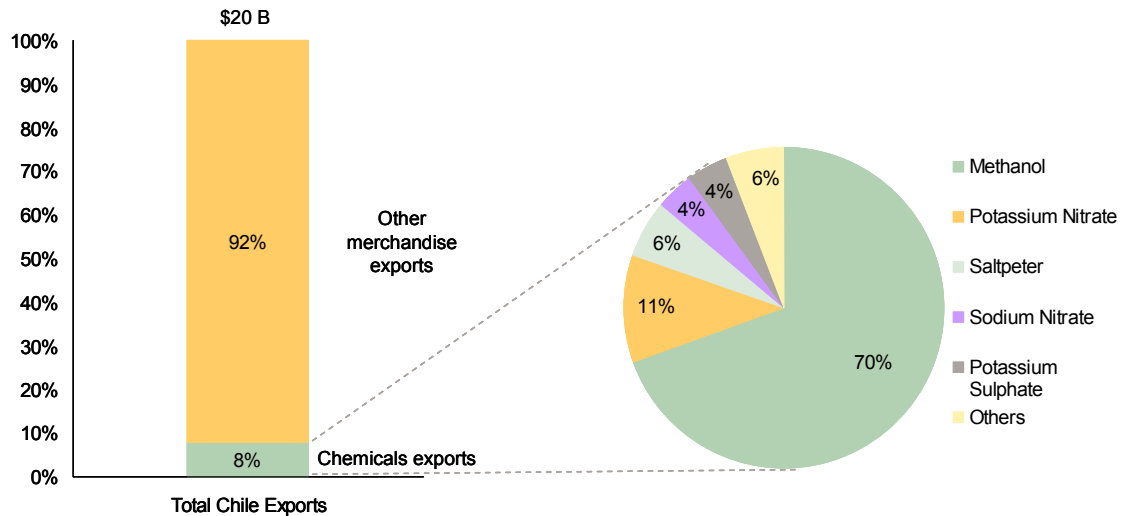
⁷ UN COMTRADE.

⁸ Chilean Fresh Fruit Association.

Chemicals accounted for 8 percent of Chile’s merchandise exports in 2003. Chilean sea exports of chemicals include methanol (70 percent of tons), saltpeter (6 percent), and sodium nitrate and potassium sulfate (4 percent each) (Exhibit 4-13).

Exhibit 4-13

Chilean Chemical Exports and Total Exports
(percentage of tons)



Source: Banco Central de Chile, DIRECTEMAR.

4.3.4 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 produced in over 100 countries. North America is the largest consumer of salt.

In 2002 and 2003, the United States remained the world’s leading salt-producing country, representing 19 percent of total world output. In terms of exports, the largest world exporters in 2003 were the Netherlands, Germany, and Australia, accounting for over 40 percent of exports. Chile was the seventh largest salt exporter, with 4 percent of total world salt exports.⁹

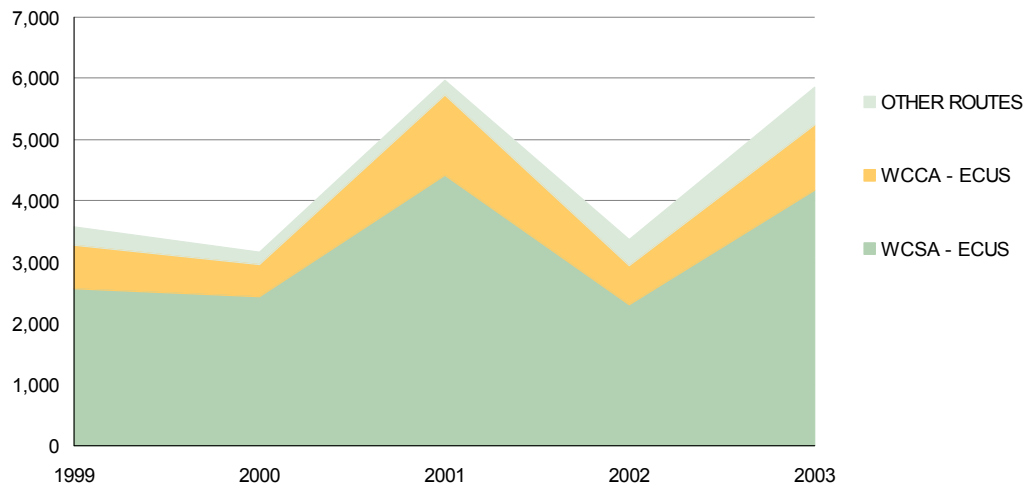
On average during 1999-2003, Chile was the largest user of the Canal for salt exports, accounting for 69 percent of total salt tonnage transiting the Canal. Mexico and Peru are also important exporters and these three countries account for over 95 percent of the salt that transits the Canal.

Ninety-one percent of salt tons transiting the Canal move eastbound from the West Coast of Latin America to the United States; 75 percent of this salt is exported by Chile and the remainder by Mexico (Exhibit 4-14). In 2003, the US imported 3.9 million tons of salt from Chile. Of the salt arriving on the US Gulf and East Coasts, 86 percent is destined for

⁹ US Geological Survey.

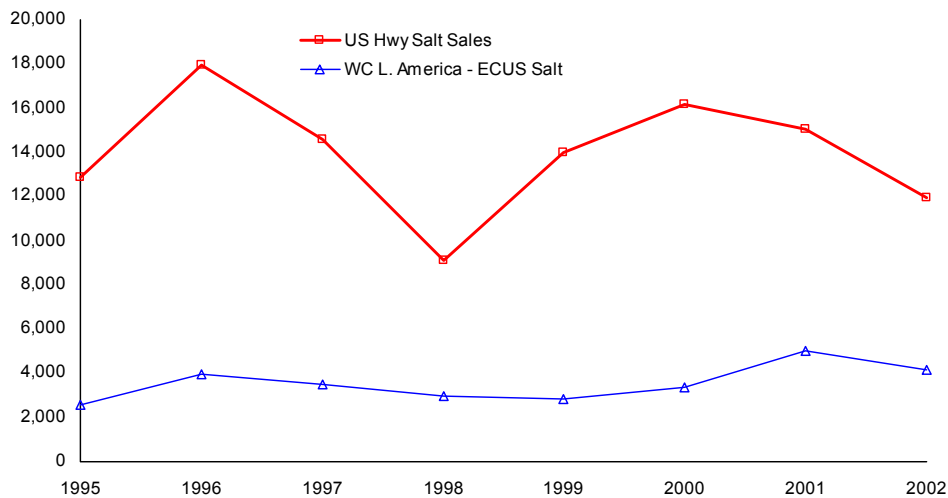
North Atlantic ports; there is a moderately strong correlation between US highway salt sales and eastbound Canal salt volume (Exhibit 4-15). In value terms, 80 percent of total Chilean salt exports are bound for the United States; Chile also exports salt to Brazil, Canada, and the Netherlands.

Exhibit 4-14
Panama Canal Salt Traffic: 1999-2003
 (000 tons)



Source: Autoridad del Canal de Panama (ACP).

Exhibit 4-15
Canal Salt Traffic vs. US Highway Salt Sales: 1996-2002
 (000 tons)

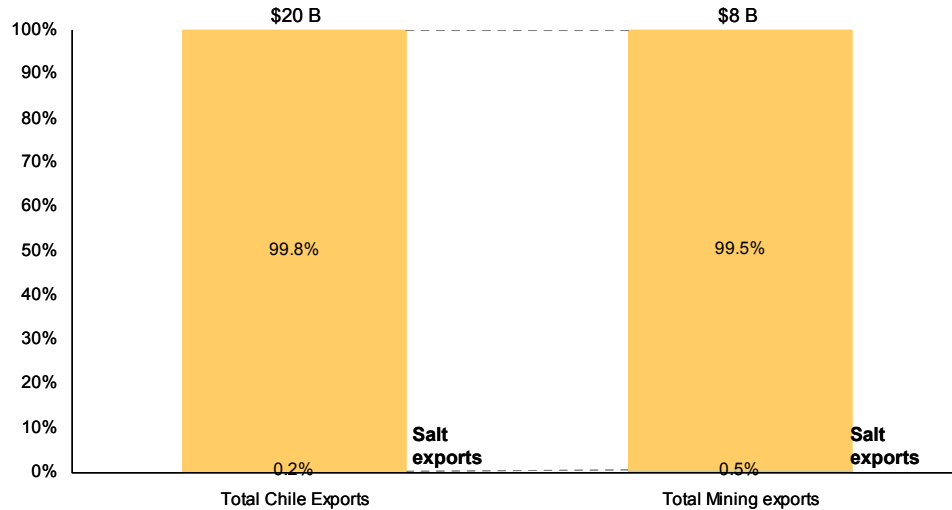


Source: ACP, Salt Institute.

Mining is Chile's most important primary production sector; during 1996-2003, it accounted for around 7 percent of GDP (in 1996 constant pesos). However, salt only

accounts for 0.5 percent of Chile’s mining product exports and around 0.20 percent of total merchandise exports, as seen in Exhibit 4-16.

Exhibit 4-16
Chile’s Salt Exports and Total Exports
 (US\$ billions)



Source: Banco Central de Chile, DIRECTEMAR.

4.3.5 Wood Products

For wood products, only wood pulp and boards, plywood and veneers were analyzed, given that these are the most Canal-relevant wood products exported from Chile.

Wood Pulp

Wood currently provides the basis for approximately 90 percent of global pulp production. Pulp is a generic term for a wide range of technically distinct products resulting from complex manufacturing processes that involve the chemical and/or mechanical treatment of various types of plant material. The primary use for wood pulp is in the creation of paper and paperboard products.

The United States is the largest pulp producer in the world, with an output of 52.3 million tons in 2003. Canada ranked second, with a total of 26 million tons produced, 1.7 percent more than in 2002.¹⁰ Chile is the fifth largest exporter, with 4 percent of total world wood pulp exports.

Chile’s exports of wood products transiting the Canal during 1999-2003 were fairly stable at around 3 million tons per year. Chile’s share of wood pulp exports transiting the Canal

¹⁰ Pulp and paper products council, www.pppc.org.

during this period, however, decreased from 9 to 4 percent. Chile is currently the fourth largest pulpwood exporter by volume using the Panama Canal. Chile's pulpwood exports transiting the Panama Canal are mainly bound for the US, Venezuela, and Europe (Italy, Germany, and the Netherlands).

The pulp and paper industry accounts for 6 percent of Chile's total merchandise exports. Within the pulp and paper sector, pulpwood exports account for 70 percent of industry exports.

Boards, Plywood, Veneers

World lumber trade amounted to 55.7 million tons in 2003, with 4.6 million tons moving in international trade.¹¹ The lumber category includes lumber (boards and planks), plywood, and wood chips.

The demand for wood is universal, with major centers of demand closely correlated with the size and scale of domestic economies. While historically Europe, the United States, and Japan were major importers, China and the Asian economies are experiencing growing demand for lumber of all kinds. Major producers include Russia, Chile, Brazil, and the Philippines.

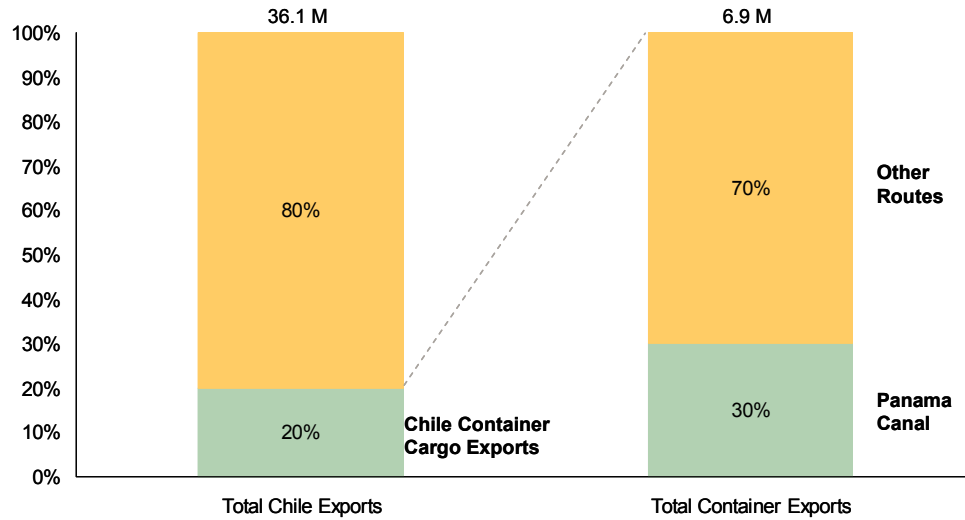
The lumber and wood industry is an important merchandise exports sector for Chile, accounting for 6 percent of total merchandise exports. Within this sector, plywood, boards and veneers account for over 85 percent of exports. The main importers of Chilean wood products are China, Italy, Korea, and the Netherlands.

4.3.6 Containerized Cargo

Chile's sea exports are mainly bulk cargoes; however, in 2002, approximately 20 percent of total Chilean export tonnage was containerized and approximately 30 percent of Chilean container exports transited the Panama Canal. Furthermore, 19 percent of total Chilean exports that transit the Canal are containerized cargo (Exhibit 4-17).

¹¹ Nathan Study

Exhibit 4-17
Chilean Container Exports Through the Panama Canal: 2002
 (tons)



Source: DIRECTEMAR, ACP.

The main trade lanes relevant to the Canal for Chilean exported container cargo are Europe, ECUS, ECCA, ECSA, and the West Indies. The main commodities exported in containers are wood products, vegetable preparations, beverages (mainly wine), and edible fruit and cereals, which are discussed in more detail below.¹²

Some of the commodities Chile exports in containers are also exported in bulk; in these cases, bulk transport generally makes up the majority of cargo transport.

Wood Products

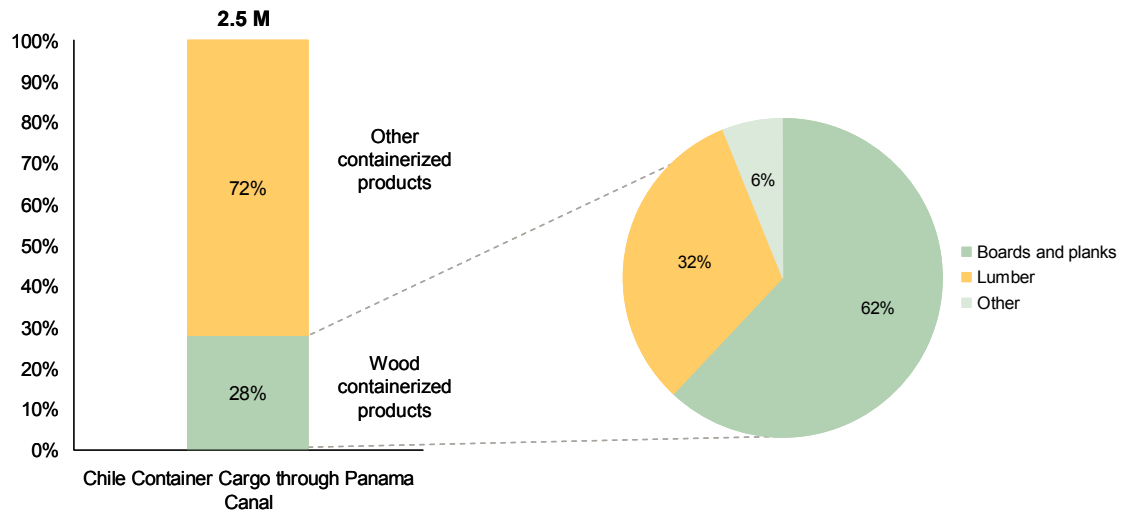
Wood products transported in containers account for 28 percent of exported containerized cargo. Boards and planks, plywood and miscellaneous lumber account for 94 percent of total containerized wood products (Exhibit 4-18).

Please see section 4.3.5 for discussion of wood products transported as bulk commodities.

¹² US Waterborne Commerce imports, correlated with EU imports from Eurostat.

Exhibit 4-18

Chilean Containerized Wood Exports Through the Panama Canal: 2003
(tons)



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

Vegetable and Fruit Preparations

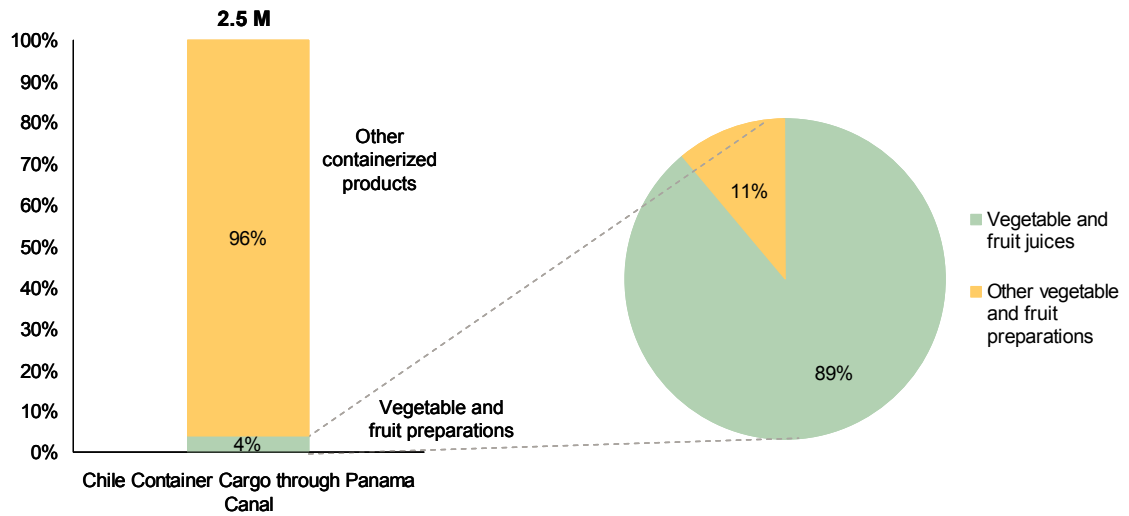
This category includes vegetable or fruit preparations such as jellies, jams, frozen fruit or vegetables, and packed juices. On a worldwide scale, Brazil is the main exporter of fruit and vegetable juices, with a 16 percent share of total world exports, followed by the US with a share of 9.9 percent. Chile exports only around 1 percent of these products.¹³

Vegetable preparations account for 4 percent of total Chilean tonnage exported in containers that transits the Canal. Fruit and vegetable juices account for 89 percent of the total vegetable preparations tonnage Chile exports in containers (Exhibit 4-19).

¹³ UN COMTRADE

Exhibit 4-19

Chilean Containerized Vegetable Prep. Exports through the Canal: 2003
(tons)



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

Beverages

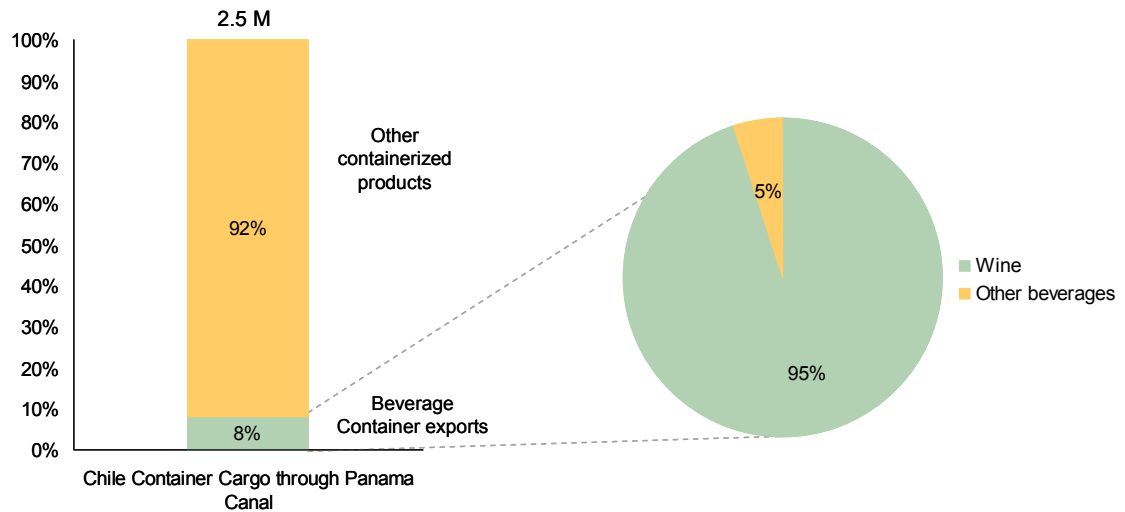
Chile's main exported product within this category is wine. In 2003, France was the top grape wine exporter, with a 37 percent share of total world exports. Chile was the fifth most important grape wine exporter, with a share of 3.8 percent.¹⁴

Beverages (mainly wine) account for 8 percent of the total Chilean tonnage exported in containers that transit the Panama Canal. Grape wines account for over 95 percent of the total beverage tonnage exported by Chile in containers (Exhibit 4-20).

¹⁴ UN COMTRADE

Exhibit 4-20

Chilean Containerized Beverage Exports Through the Panama Canal: 2003
(tons)



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

Fruit

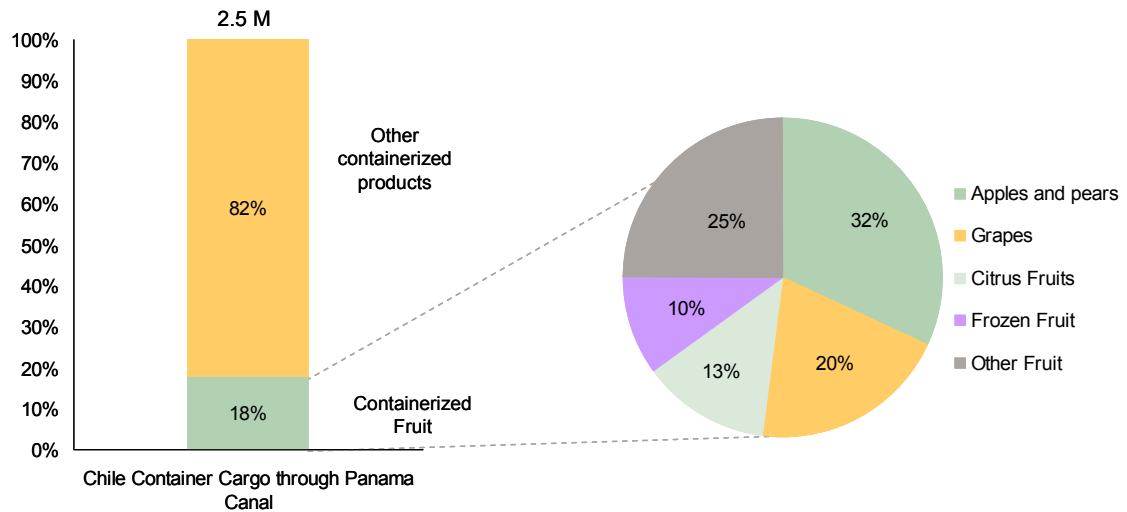
Edible fruit accounts for 18 percent of the total Chilean tonnage exported in containers that transits the Panama Canal. Apples, pears, table grapes, and citrus fruits account for 60 percent of the total fruit tonnage exported by Chile in containers (Exhibit 4-21).¹⁵

Please see section 4.3.2 for discussion of fruit transported as a bulk refrigerated commodity. According to Drewry Shipping Consultants, although fruit is transported in refrigerated containers, bulk fruit transported in reefer vessels is expected to remain the major mode of transport for fruit by sea.

¹⁵ US Waterborne Commerce export data, 2003.

Exhibit 4-21

Chilean Containerized Fruit Exports Through the Panama Canal: 2003
(tons)



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

Cereals

Chile mainly exports seeds for crop growing. In 2002, 86 percent of exported seeds were hybrid maize seeds,¹⁶ accounting for 52 percent of the exported value for seeds.

Cereals account for 4 percent of the total Chilean tonnage exported in containers that transit the Panama Canal. Hybrid maize seeds account for 100 percent of the total cereal tonnage exported by Chile in containers.

Hybrid maize seed production is a specialized process. If an interested company decides that it wants a national producer of maize (corn) to supply it with a particular hybrid variety, it sends the variety to be reproduced to Chile, which produces the seed in quantity and exports it back. Only 67 companies exported US\$125 million worth of hybrid maize seed in 2003. Currently, Chile is the sixth largest seed supplier in the world, with a participation of 5 percent in the world market.¹⁷

Planting seed production is increasingly moving to Southern European, African and similar countries, because of lower costs, (such as labor and heating) and less cumbersome regulations. Part of this production is shipped to countries like the US or Netherlands for cleaning, coating and nursing, and re-exported to the final destination. For that reason, the Netherlands remains an important trader, processor and packager of planting seeds. During the past four years, Dutch planting seed exports grew from US\$90 million in 2000/2001 to US\$826 million in 2003/2004.¹⁸

¹⁶ ANPROS: Asociación Nacional de Productores de Semillas.

¹⁷ Seed News, January 2004.

¹⁸ Grains.org.

4.4 Canal-Relevant Chilean Import Commodities

Chile imports a wide diversity of products, from raw materials and fuels such as coal to finished goods such as machinery. Containerized cargo is also 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 Coal

Coal is produced in many countries, and most of the 3.5 billion tons produced annually are consumed domestically, with only 0.5 billion tons traded internationally.

Coal is a major import for Chile in terms of tonnage moved by sea. Canal-relevant coal destined for Chile is sourced mainly from Venezuela, with an average share of 74 percent in this lane over the last five years, and 91 percent share in 2003.

4.4.2 Miscellaneous Fertilizers

This group includes fertilizers such as nitrogen, phosphorus, potassium, calcium, sulfur, and magnesium. In 2003, Chile imported US\$111 million worth of misc. fertilizers.¹⁹ Chile mainly imports urea (56 percent), other phosphates (24 percent), ammonium dihydrogenorthophosphate (13 percent) and diammonium phosphate (8 percent).²⁰

Fertilizers transiting the Canal to Chile are sourced from Venezuela (27 percent), from the East Coast US (24 percent), East Coast Mexico (17 percent), and the Netherlands (7 percent).

4.4.3 Petroleum Products

Chile petroleum products imports include mainly crude petroleum, diesel oil, gasoline and liquefied gas. In 2003, Chile imported US\$3.3 billion in petroleum products.²¹ Chile's Canal-relevant crude petroleum (95 percent) and liquefied gas imports are sourced mainly from Venezuela, diesel oil imports are sourced mainly from the Netherlands and the East Coast US, and gasoline imports are sourced mainly from the East Coast US.

4.4.4 Grain

¹⁹ ECLAC.

²⁰ DIRECTEMAR.

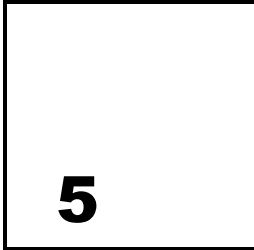
²¹ UN Comtrade.

Corn is primarily used to feed livestock, but is also a major source of food products for human consumption. Wheat is a staple grain that is processed to make many end-consumer foodstuffs. Chile mainly imports corn and wheat as dry bulk commodities. Chile's main source for these two commodities is the United States, and thus all Canal-relevant Chile imported corn and wheat is sourced from the East Coast US.

4.4.5 Iron and Steel

World steel production reached 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. A total of 40 nations supply 97 percent of the world's crude steel.

Chile mainly imports iron and steel plates, sheets and coils through the Panama Canal, and the most relevant trade lanes for these imports are Russia (43 percent), Belgium (10 percent), and Romania (10 percent).



Canal-Relevant Commodities Analysis

5.1 Methodology for Export Commodities Analysis

This section provides the results of an analysis of the Chile 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 Chile's trade and economy.

The methodology for analysis was threefold:

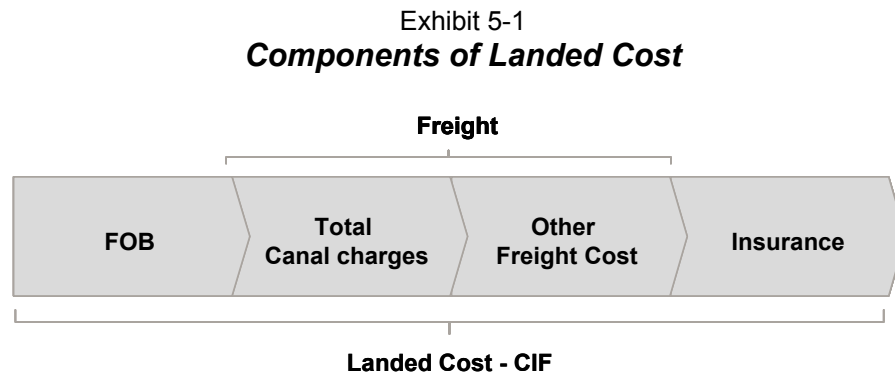
1. The relevance of Panama Canal tonnage transits for 1999-2003 to the overall trade in the commodity for Chile was determined. Where possible, commodities were matched to the ACP's description of each category and HS 4-digits or HS2-digits.
2. If the commodity tonnage transits through the Canal were 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 Chilean exports, freight and insurance charges were determined by calculating these charges for Chilean 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 Chilean trade:

- Total value of the exports of a specific commodity compared to total Chilean exports
- Total value of the specific commodity transiting the Canal compared to the value of Chile'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 Panama Canal costs (toll and other marine services). For the purposes of this analysis, landed cost was unbundled as shown in Exhibit 5-1.



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 use a benchmark value obtained from DIRECTEMAR (Dirección General del Territorio Marítimo y de Marina Mercante) data. Using 2002 data, the FOB/ton, insurance/ton, freight/ton, and CIF/ton values were obtained and these ratios were then used to convert the tonnage transiting the Canal into US dollar values.
- Containerized commodities:
 - Mercer used a benchmark value obtained from the US Waterborne Commerce 2003 database for US imports from Chile to estimate the FOB, freight and insurance, and CIF values.
 - The commodities to be analyzed were obtained using 2003 US Waterborne Commerce data. Commodities accounting for around 70 percent of Chile's containerized cargo to an HS2 level were selected, these include wood products (HS2 code 44), preparations of fruits and vegetables (HS2 code 20), beverages,

mainly wine (HS2 code 22), fruit (HS2 code 08) and cereals, mainly specialty corn/maize (HS2 code 10).

- Given that Europe is one of the most relevant markets for containerized Chilean cargo, the selected commodities were backed-up by obtaining the relevant Chilean exported commodities at the HS2 level using Eurostat data for 2003. In the case of Chile, 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 60 percent of 2003 Canal-relevant containerized Chilean exports were accounted for.

When a commodity was analyzed as bulk 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 (i.e. wood products and fruit)

The average Canal toll per ton for each commodity was calculated using ACP data from ships 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 cost out of the total landed cost, i.e.:

$$\text{Total Canal Charges} / (\text{FOB} + \text{Canal Charges} + \text{Freight} + \text{Insurance}) = \text{Total Canal Charges as \% of CIF}$$

For the purposes of this study, 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 per ton value was obtained. Other marine services charges (OMS) were calculated as a percentage of total Canal charges for each analyzed commodity (OMS averages 22 percent of total Canal charges.)

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 as a constant.

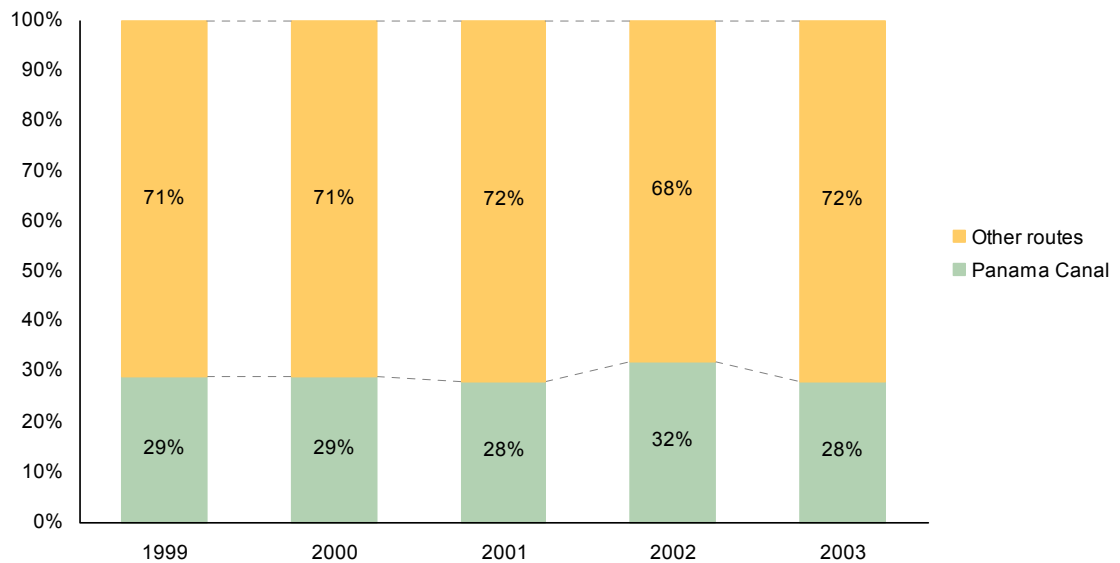
5.2 Copper

5.2.1 Overview

Copper ore and copper metal are mainly transported as bulk cargo, however a significant amount is transported in containers.

Between 1999 and 2003, around 30 percent of Chile’s copper exports transited the Panama Canal. Copper sea exports have remained fairly stable at around 7.6 million tons, of which 2.2 million tons transit the Canal. Sixty percent of this is refined copper (Exhibit 5-2).

Exhibit 5-2
Canal Transit Share of Chilean Copper Sea Exports: 1999-2003
(percentage of tons)

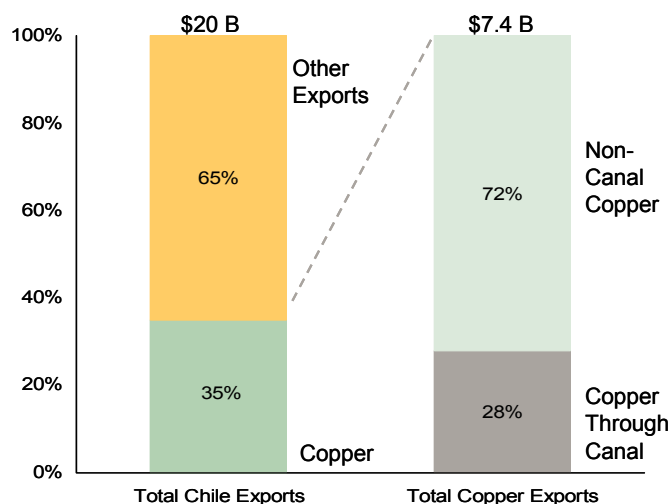


Source: Mercer analysis, DIRECTEMAR 2002, ACP database.

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

These analyses determined that the value of total Chilean copper (ore and metal) in 2003 was \$7.4 billion dollars, which represented 35 percent of total Chilean exports (Exhibit 5-3). Of this, 28 percent transited the Panama Canal.

Exhibit 5-3
Canal Transit Share of Total Chilean Copper Exports: 2003
 (US\$)



Source: Mercer analysis, DIRECTEMAR 2002, Banco Central de Chile, ACP data.

5.2.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-4 shows the cost components of the calculated CIF for Chile copper exports. Using the methodology described in section 5.1, the analysis found that the Canal cost represents 0.51 percent of Chilean copper ore CIF and 0.15 percent of Chilean copper metal CIF, respectively.

Exhibit 5-4
Total Canal Cost Share of Chilean Exported Copper CIF (Landed Cost)
 (2003 values in US\$/ton)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Copper metal	\$1,713	\$35.7	\$2.6	\$1,751	0.15%
Copper ore	\$464	\$15.5	\$2.5	\$482	0.51%

Source: Mercer analysis, DIRECTEMAR, 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 slight impact on the commodity's total landed cost.

A sensitivity analysis further showed that copper ore and copper metal exports would be slightly affected by Panama Canal toll changes (Exhibits 5-5 and 5-6). Through this sensitivity analysis it is possible to see that the CIF price for copper metal would increase by a maximum 0.22 percent, which is equivalent to US\$ 3.90 per ton,

with a 200 percent Canal toll increase. Similarly, the CIF price of Chilean copper ore would increase by 0.78 percent, equivalent to US\$3.80 per ton.

Exhibit 5-5

Sensitivity Analysis for Chilean Copper Metal CIF

Toll increase	50%	100%	150%	200%
CIF price impact	0.06%	0.11%	0.17%	0.22%
New CIF price	US\$ 1,752.2	US\$ 1,753.2	US\$ 1,754.1	US\$ 1,755.1

Source: Mercer analysis.

Exhibit 5-6

Sensitivity Analysis of Chilean Copper Ore CIF

Toll increase	50%	100%	150%	200%
CIF price impact	0.2%	0.39%	0.59%	0.78%
New CIF price	US\$ 482.8	US\$ 483.7	US\$ 484.6	US\$ 485.6

Source: Mercer analysis.

5.2.3 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 in on the basis of the alternate route from Chile 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 metal or copper ore. Therefore, the impact of a Canal toll increase would not have a significant effect on Chile’s trade and economy nor on the industry’s role in the Chilean economy.

5.3 Fruit

5.3.1 Overview

The analysis in this section was carried out for both bulk and containerized fruit.

During 1999-2002, in tonnage terms, around 24 percent of Chile's fruit sea exports transited the Panama Canal as bulk; additionally, approximately 20 percent was transported in containers in 2003. During 1999-2002, total fruit sea exports increased by an average of 13 percent per year, while Chilean bulk fruit transiting the Canal increased by 15 percent.(Exhibit 5-7).

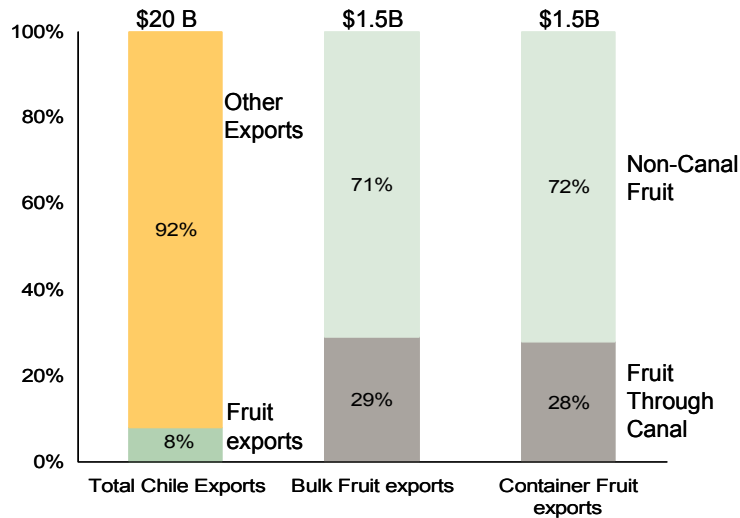
The total value of Chilean fruit exports in 2003 was \$1.5 billion dollars, representing 8 percent of total Chilean exports (Exhibit 5-8). In value terms, 29 percent of fruit transited the Panama Canal as bulk and 28 percent in containers.

Exhibit 5-7
Canal Transit Share of Chilean Fruit Sea Exports
 (percentage of 000 tons)



Source: Mercer analysis, ECLAC, ACP database.

Exhibit 5-8
Canal Transit Share of Total Chilean Fruit Exports: 2003
 (US\$)



Source: Mercer analysis, DIRECTEMAR 2002,2003 US Waterborne Commerce, Eurostat, Banco Central de Chile, ACP data.

5.3.2 Panama Canal Cost Share of Landed Cost

In section 5.1 the analysis methodology for commodities was described, however, given that fruit out of Chile can be transported as bulk or in containers, the toll relevance for fruit landed costs used the following data:

- For bulk fruit, either DIRECTEMAR or US Waterborne Commerce bulk fruit import data was used, both for FOB and CIF per ton values.
- For containerized fruit, 2003 US Waterborne Commerce containerized fruit imports from Chile data was used and an average for all containerized fruit products was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11 tons/TEU²² and the Canal Charges per TEU are valued at \$40.6 and Canal tolls at \$30.5 dollars.

Exhibit 5-9 shows the cost components of the calculated CIF for Chilean fruit exports. Total canal costs represent 1.03 percent of bulk fruit CIF and 0.30 percent of containerized fruit CIF.

²² Mercer Management Consulting Demand Forecast Model

Exhibit 5-9

Total Canal Share of Chilean Exported Fruit CIF (Landed Cost)

(2003 values in US\$/ton or US\$/TEU)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Bulk Fruit	\$603	\$169.9	\$8.0	\$781	1.03%
Containerized Fruit (\$/TEU)	\$11,328.7	\$2,157.0	\$40.6	\$13,526.3	0.30%

Source: Mercer analysis, DIRECTEMAR, 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 slight impact on the commodity's total landed cost.

A sensitivity analysis further showed that fruit exports would be only slightly by changes to Panama Canal tolls. With a toll increase of 200 percent, the CIF price for bulk fruit would increase by a maximum of 1.69 percent and for containerized fruit by 0.45 percent, which is equivalent to US\$ 13.2 per ton for bulk fruit and US\$61.1 per TEU for containerized fruit compared to a total CIF value of \$781 and \$13,526 respectively. (Exhibit 5-10)

Exhibit 5-10

Sensitivity Analysis for Chilean Fruit CIF

Toll increase	50%	100%	150%	200%
Bulk fruit CIF price impact	0.42%	0.84%	1.27%	1.69%
Containerized fruit CIF price impact	0.11%	0.23%	0.34%	0.45%

Source: Mercer analysis.

5.3.3 Analysis of Commodity Relevance

Chilean fruit competes with only a few alternative sources, such as New Zealand and Australia, which would also be affected by an increase in tolls, given that they also use the Canal route to export fruit to Europe or the East Coast US. Additionally, only 8 percent of Chile's fruit exports transit the Canal; thus a slight increase in tolls for fruit transiting the Canal would not materially affect the Chilean economy.

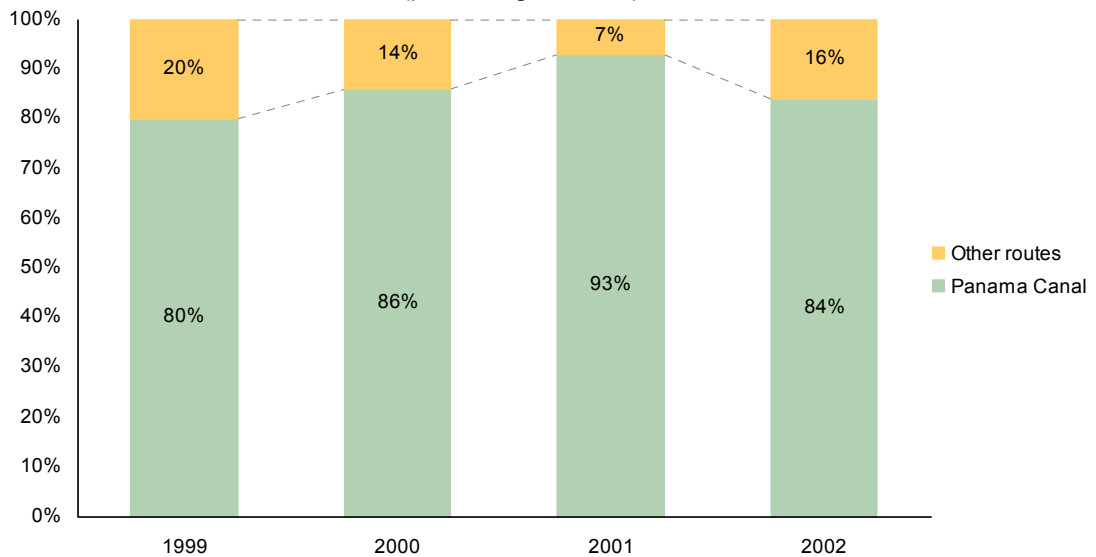
5.4 Salt

5.4.1 Overview

During 1999-2002, around 86 percent of total Chilean salt exports by sea transited the Canal, in tonnage terms (Exhibit 5-11).

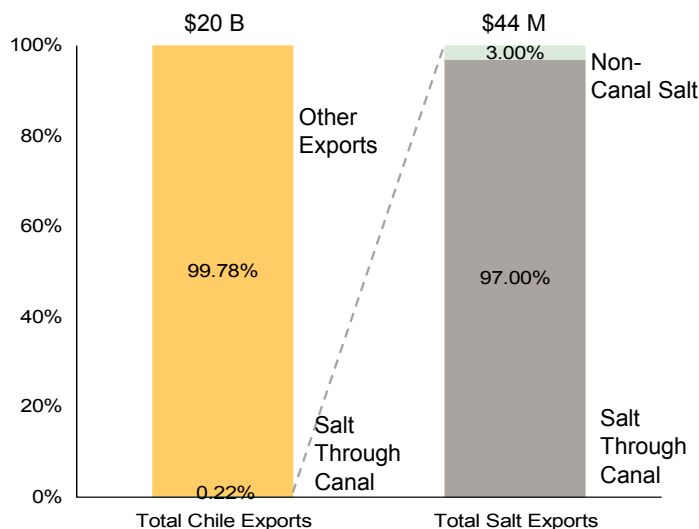
Total Chilean salt exports in 2003 were \$44.5 million dollars, representing 0.22 percent of total Chilean exports (Exhibit 5-12). Salt tons transiting the Canal represent 97 percent of total Chile salt sea exports in value terms.

Exhibit 5-11
Canal Transit Share of Chilean Salt Sea Exports: 1999-2002
 (percentage of tons)



Source: Mercer analysis, DIRECTEMAR 2002, ACP data.

Exhibit 5-12
Canal Transit Share of Chilean Salt Exports: 2003
 (US\$)



Source: Mercer analysis, DIRECTEMAR 2002, Banco Central de Chile, ACP data.

5.4.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-13 shows the cost components of the calculated CIF for Chilean salt exports. The analysis found that total Canal costs represent 9.15 percent of Chilean salt CIF.

Exhibit 5-13
Total Canal Cost Share of Chilean Exported Salt CIF (Landed Cost)
 (2003 values in US\$/ton)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Salt	\$10.3	\$9.8	\$2.0	\$22.1	9.15%

Source: Mercer analysis, DIRECTEMAR, 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 significant impact on the commodity's total landed cost.

Additionally, a sensitivity analysis determined that the CIF price for salt would increase by 14.21 percent, which is equivalent to US\$3.1 per ton, if the Canal toll were increased by the maximum of 200 percent (Exhibit 5-14).

Exhibit 5-14

Sensitivity Analysis for Chilean Salt CIF

Toll increase	50%	100%	150%	200%
CIF price impact	3.55%	7.11%	10.66%	14.21%
New CIF price	US\$ 22.9	US\$ 23.7	US\$ 24.5	US\$ 25.3

Source: Mercer analysis.

5.4.3 Analysis of Commodity Relevance

The East Coast US is the main destination for salt transiting the Canal from Chile. 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 Chilean 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.²³ 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.

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 Chile’s total exports (0.22 percent) and thus Chilean trade and the economy are not expected to be impacted by a Canal cost increase for salt exports.

5.5 Wood Products

5.5.1 Overview

Wood products were analyzed both as bulk and containerized commodities, given that approximately 28 percent of Canal relevant containerized cargo consists of wood

²³ U.S. Census Bureau, 2002, US Geological Survey Minerals Yearbook, 2002.

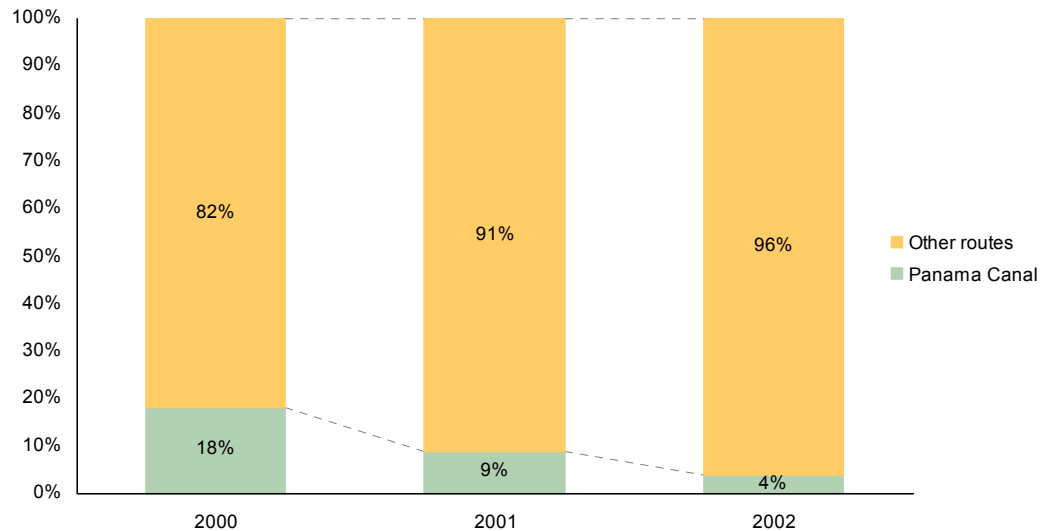
products.²⁴ The major difference is that containerized wood products are of higher value than bulk commodities.

Canal-relevant Chilean wood products transported as bulk are mainly pulpwood, boards, plywood and veneers. Canal-relevant Chilean wood products transported in containers include boards, plywood, veneers and wood products such as tools and shoe lasts.

During 2000-2002, the share of total Chilean pulpwood exports by sea transiting the Panama Canal decreased from 18 percent to 4 percent, although Chile's total sea exports of pulpwood increased by an average of 8 percent during the same period (Exhibit 5-15). This is due to an increase in pulpwood exports to Asia at the expense of Europe and the US.

Also during 2000-2002, the share of Chilean wood products (boards, plywoods, veneers) exported through the Canal increased with respect to total sea exports of wood, mainly due to an increase in imports from the East Coast of Central America (Exhibit 5-16).

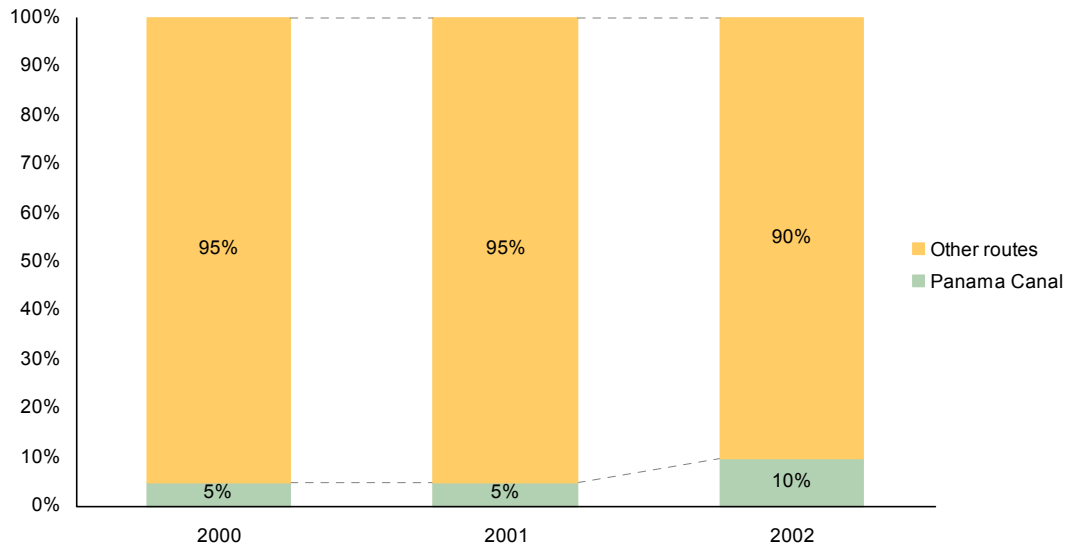
Exhibit 5-15
Canal Transit Share of Chilean Pulpwood Sea Exports: 2000-2002
(percentage of tons)



Source: Mercer analysis, ECLAC, ACP database.

²⁴ 2003 Waterborne Commerce import data.

Exhibit 5-16
Canal Transit Share of Chilean Wood Sea Exports: 2000-2002
 (percentage of tons)

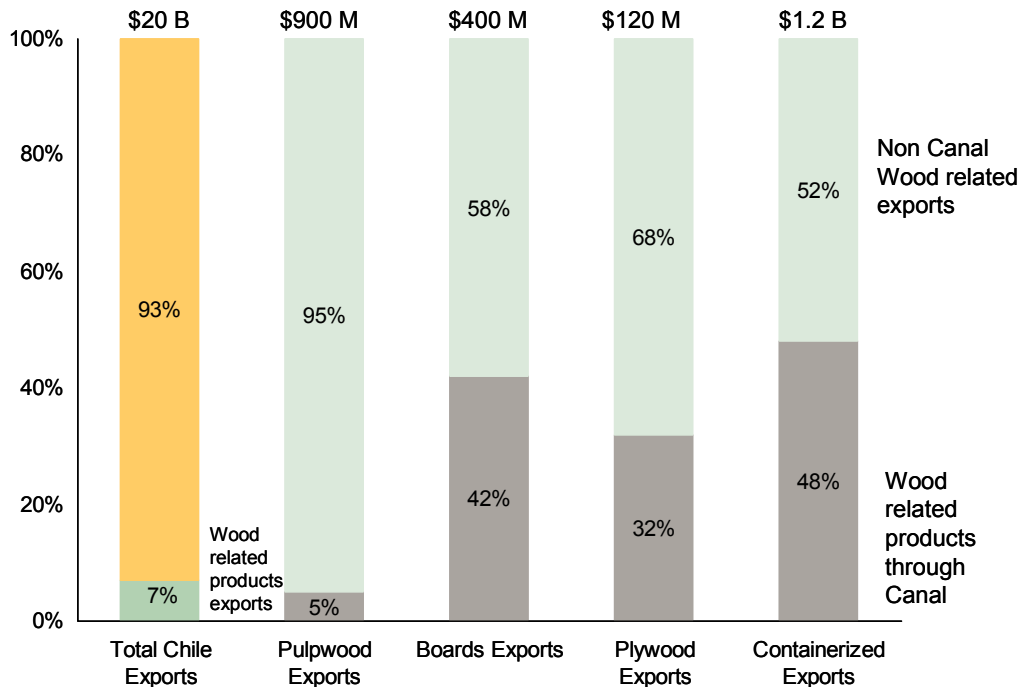


Source: Mercer analysis, ECLAC, ACP database.

The value of total Chile Canal-relevant wood products in 2003 was \$1.4 billion dollars, which represented 7 percent of total Chilean exports (Exhibit 5-17). The analysis was carried out for the three major commodities groups and containerized wood products:

- *Pulpwood*: tons transiting the Canal represent 5 percent of total pulpwood exports
- *Boards and planks*: tons transiting the Canal represent 43 percent of total boards and planks exports
- *Plywood and veneers*: tons transiting the Canal represent 32 percent of total boards and planks exports
- *Containerized wood products*: tons transiting the Canal represent 48 percent of total wood product containerized exports

Exhibit 5-17
Canal Transit Share of Chilean Wood Products Exports: 2003
 (US\$)



Source: Mercer analysis, DIRECTEMAR 2002, UN Comtrade, US Waterborne Commerce export data 2003, Eurostat, ACP data

5.5.2 Panama Canal Cost Share of Landed Cost

In section 5.1 the analysis methodology for commodities was described, however, given that wood products out of Chile can be transported as bulk or in containers, the analysis utilized the following data:

- For bulk wood products, either DIRECTEMAR or US Waterborne Commerce bulk wood product imports data was used, both for FOB and CIF per ton values.
- For containerized wood products, 2003 US Waterborne Commerce containerized wood products imports from Chile data was used and an average for all containerized wood products was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 7 tons/TEU²⁵ and the Canal Charges per TEU are valued at \$40.6 and Canal tolls at \$30.5 dollars.

Exhibit 5-18 shows the cost components of the calculated CIF for Chile wood products exports, where total Canal cost as a percent of CIF is as follows:

- 0.96 percent of Chilean bulk pulpwood CIF

²⁵ Mercer Management Consulting Demand Forecast Model

- 0.76 percent of Chilean bulk boards and planks CIF
- 0.76 percent of Chilean bulk plywood and veneers CIF
- 0.62 percent of Chilean containerized wood products CIF

Exhibit 5-18

Total Canal Cost Share of Chilean Exported Wood Products CIF
(2003 values in US\$/ton or \$/TEU)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Pulpwood	\$364	\$31.3	\$3.8	\$399	0.96%
Boards and planks	\$432	\$46.2	\$3.7	\$481	0.76%
Plywood and veneers	\$521	\$61.5	\$4.4	\$586	0.76%
Containerized wood products (\$/TEU)	\$5,966.5	\$494.5	\$40.6	\$6,501.6	0.62%

Source: Mercer analysis, DIRECTEMAR, 2003 US Waterborne Commerce imports data, UN Comtrade, ACP data.

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

Additionally, a sensitivity analysis was conducted to determine the maximum impact on wood products' landed cost given up to a 200 percent increase in Canal tolls (Exhibit 5-19).

- *Pulpwood*: the CIF price of pulpwood would increase by 1.5 percent, which is a difference of \$6.0 dollars per ton.
- *Boards and planks*: the CIF price of pulpwood would increase by 1.2 percent, which is a difference of \$5.8 dollars per ton
- *Plywood and veneers*: the CIF price of pulpwood would increase by 1.2 percent, which is a difference of \$7.0 dollars per ton
- *Containerized wood products*: the CIF price of pulpwood would increase by 0.94 percent, which is a difference of \$61.1 dollars per TEU

Exhibit 5-19

Sensitivity Analysis of Chilean Wood Products CIF

Toll increase	50%	100%	150%	200%
Pulpwood CIF price impact	0.37%	0.75%	1.12%	1.50%
Boards and planks CIF price impact	0.30%	0.60%	0.90%	1.20%
Plywood and veneers CIF price impact	0.30%	0.59%	0.89%	1.19%
Containerized wood products CIF price impact	0.23%	0.47%	0.70%	0.94%

Source: Mercer analysis.

5.5.3 Analysis of Commodity Relevance

Low density cargoes such as wood pulp incur very high shipping costs because relatively few tons per PCUMS can be carried. Although Canal tolls also increase per ton, the impact is relatively limited because toll cost is relatively small compared with shipping costs. In general, low density cargoes will be less sensitive to toll increases than heavy lumber and plywood cargoes.

With regard to more general lumber products, Chile continues to build a broad and important relationship as a supplier to the Atlantic basin, notably the United States. Chile has emerged as a key source of manufactured forest products, and these trades serve as a valuable backhaul for southbound “conbulklers” that carry merchandise south and lumber north.

While tolls are an element in the transportation costs of lumber products, they are not as critical in these trades given the relatively high values of the commodities; the combination of production costs and shipping costs are relatively greater importance. The impact of tolls is likely to be exceeded by fluctuations in other marine costs on many routes.

Eastbound flows from Chile are based on unique needs and the abilities of producers to balance trade and compete in Europe and the US respectively. The prices of products are therefore likely to adjust to reflect transportation costs. In this sense, hardwood forest products have some flexibility when tolls represent less than 5 percent of marine logistics costs and less than 2 percent of total delivered prices. As demonstrated by the analysis above, even the maximum proposed toll increase would have an impact of 1.5 percent or

less on CIF; Chilean wood exports are therefore unlikely to be significantly affected by a Canal toll increase; nor would Chile's trade or economy overall be significantly affected.

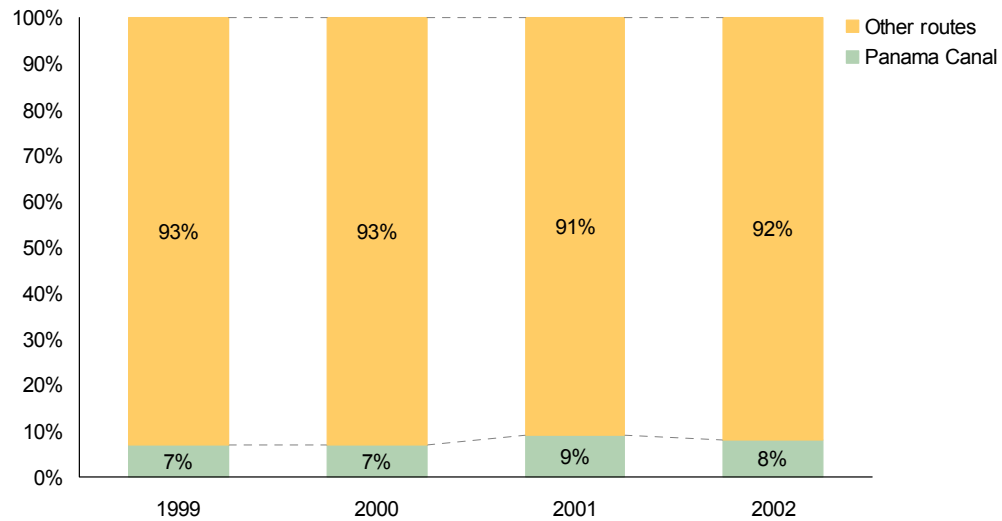
5.6 Chemicals

5.6.1 Overview

Only 8 percent of Chile's sea exports of chemicals transit the Canal in tonnage terms (Exhibit 5-20).

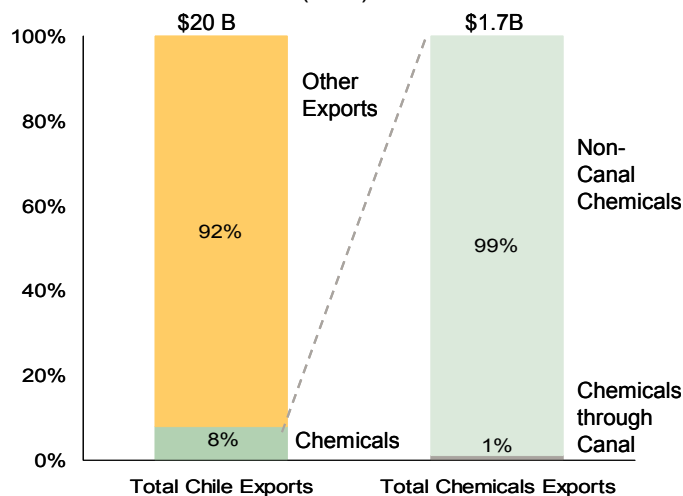
The value of total Chilean salt exports in 2003 was \$1.7 billion dollars, which represented 8 percent of total Chilean exports by value (Exhibit 5-21). Tons transiting the Canal represent 1 percent of total chemical sea exports and 0.1 percent of total Chilean exports by value.

Exhibit 5-20
Canal Transit Share of Total Chilean Chemicals Sea Exports: 1999-2003
(percentage of tons)



Source: Mercer analysis, DIRECTEMAR 2002, ACP data.

Exhibit 5-21
Canal Transit Share of Chilean Chemicals Exports: 2003
 (\$US)



Source: Mercer analysis, DIRECTEMAR 2002, Banco Central de Chile, ACP data.

5.6.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-22 shows the cost components of the calculated CIF for Chilean chemicals exports. Using the methodology described in section 5.1, the analysis found that that Canal cost represents 1.38 percent of Chilean chemicals CIF.

Exhibit 5-22
Total Canal Cost Share of Chilean Exported Chemicals CIF (Landed Cost)
 (2003 values in US\$/ton)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Chemicals	\$168	\$22.6	\$2.7	\$193	1.38%

Source: Mercer analysis, DIRECTEMAR, ACP data.

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

Additionally, a sensitivity analysis determined that the total CIF would increase by 2.04 percent, which is equivalent to US\$ 3.9 per ton, with a maximum toll increase of 200 percent (Exhibit 5-23).

Exhibit 5-23

Sensitivity Analysis of Chilean Chemicals CIF

Toll increase	50%	100%	150%	200%
CIF price impact	0.51%	1.02%	1.53%	2.04%
New CIF price	US\$ 194.4	US\$ 195.4	US\$ 196.4	US\$ 197.4

Source: Mercer analysis.

5.6.3 Analysis of Commodity Relevance

As a result of this analysis, it was determined that although chemicals play an important role in the Chilean economy, only a very small portion of this commodity’s exports are relevant to the Canal. Furthermore, a 200 percent increase in Canal tolls 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 Chile’s trade and economy nor on the industry’s role in Chile’s economy.

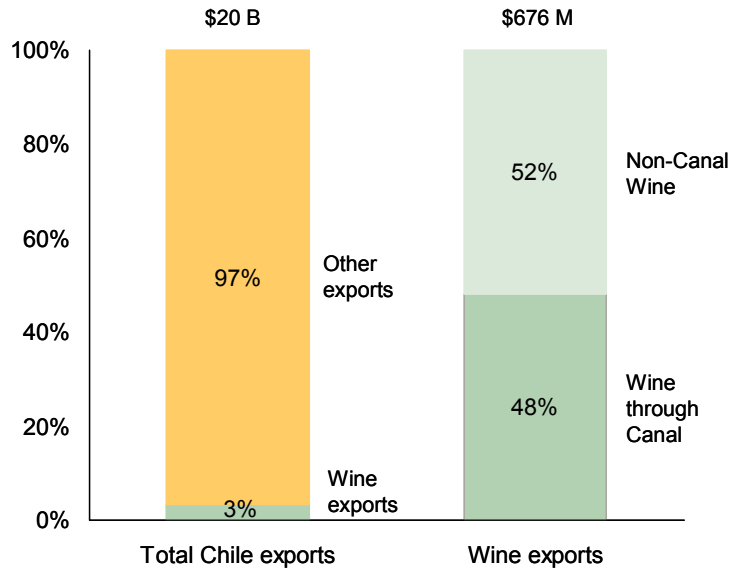
5.7 Beverages (Wine)

5.7.1 Overview

In 2003, approximately 8 percent of Chile containerized cargo that transited the Canal was wine. In 2002 approximately 77 percent of Chilean sea exported wine by volume transited the Canal, mainly bound for the US and Europe and the West Indies.

The value of total Chilean wine exports in 2003 was \$676 million dollars, which represented 3.3 percent of total Chilean wine exports (Exhibit 5-24). Nearly half of wine exports by value transit the Panama Canal; Chilean wine transiting the Canal represents 1.5 percent of total Chilean exports.

Exhibit 5-24
Canal Transit Share of Chilean Wine Exports: 2003
 (US\$)



Source: Mercer analysis, DIRECTEMAR 2002, UN Comtrade, US Waterborne Commerce export data 2003, Eurostat, ACP data

5.7.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-25 shows the cost components of the calculated CIF for Chile wine exports. Using the methodology described in section 5.1, the analysis found that the Canal cost represents 0.33 percent of Chilean wine CIF.

For containerized wine, 2003 US Waterborne Commerce data for containerized Chilean wine was used and an average for wine was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2tons/TEU²⁶ and the Canal Charges per TEU are valued at \$40.6 and Canal tolls at \$30.5 dollars.

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

Additionally, a sensitivity analysis determined that the total CIF price for wine would increase by only 0.33 percent, even if Canal tolls were increased to 200 percent (Exhibit 5-26).

²⁶ Mercer Management Consulting Demand Forecast Model.

Exhibit 5-25

Total Canal Cost Share of Chilean Exported Wine CIF (Landed Cost)
(2003 values in US\$/TEU)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Containerized Wine	\$17,098.8	\$1,377.5	\$40.6	\$18,516.9	0.33%

Source: Mercer analysis, DIRECTEMAR, 2003 US Waterborne Commerce, ACP data.

Exhibit 5-26

Sensitivity Analysis of Chilean Wine CIF

Toll increase	50%	100%	150%	200%
CIF price impact	0.08%	0.16%	0.25%	0.33%
New CIF price (\$/TEU)	US\$18,532.2	US\$18,547.5	US\$18,562.7	US\$18,578.0

Source: Mercer analysis.

5.7.3 Analysis of Commodity Relevance

Given the high value of wine and low toll per TEU, a 200 increase in Canal tolls would have an insignificant effect on landed cost. Furthermore, the cost increase on a crate of wine, which is the standard wholesale and retail pricing method, would be even more insignificant. Finally, wine exports are very minor relative to total Chilean exports, thus an increase on Canal tolls would not affect either Chilean trade or the economy.

5.8 Vegetable and Fruit Preparations

5.8.1 Overview

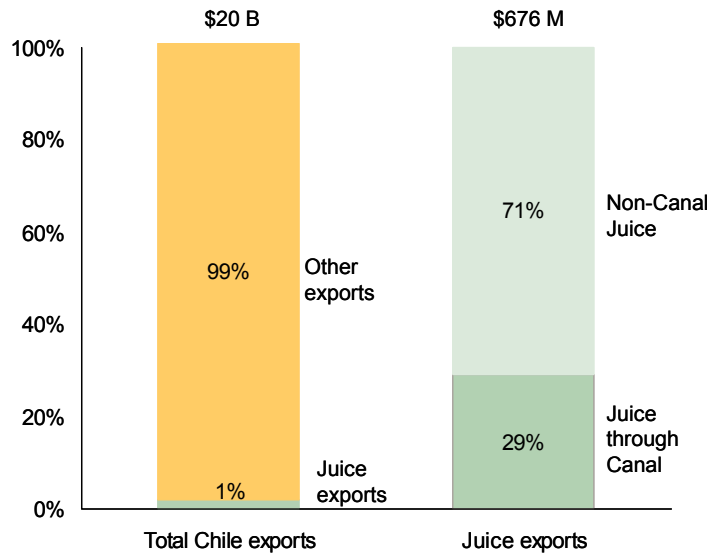
Fruit and vegetable preparation exports from Chile are mainly containerized fruit and vegetable juices (apple and tomato). In 2003, approximately 4 percent of Chilean containerized cargo that transited the Canal were fruit and vegetables juices.²⁷ In 2002, approximately 84 percent of Chile's sea exported juice by value transited the Canal, mainly bound for the US and Europe, Asia and the West Indies.

Total Chile fruit and vegetable juice exports in 2003 were \$243 million dollars, representing 1.2 percent of total Chilean exports. Juice exports transiting the Canal

²⁷ 2003 US Waterborne Commerce Chile imports, Eurostat, ACP Data, Mercer analysis

represent 29 percent of total fruit and vegetable juice exports and 0.3 percent of total Chilean exports by value (Exhibit 5-27).

Exhibit 5-27
Canal Transit Share of Chilean Juice Exports: 2003
 (\$US)



Source: Mercer analysis, DIRECTEMAR 2002, UN Comtrade, US Waterborne Commerce export data 2003, Eurostat, ACP data.

5.8.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-28 shows the cost components of the calculated CIF for Chilean fruit and vegetable juice exports. Using the methodology described in section 5.1, the analysis found that that Canal cost represents 0.64 percent of Chilean fruit and vegetable juice exports CIF.

For containerized fruit and vegetable juice, 2003 US Waterborne Commerce data for containerized Chilean fruit and vegetable juice was used and an average for fruit and vegetable juice was used both for FOB and CIF per ton values. The toll per ton value is obtained using a conversion value of 11.2tons/TEU²⁸ and the Canal Charges per TEU are valued at \$40.6 and Canal tolls at \$30.5 dollars.

²⁸ Mercer Management Consulting Demand Forecast Model.

Exhibit 5-28

Total Canal Cost Share of Chilean Exported Juice CIF (Landed Cost)

(2003 values in US\$/TEU)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Containerized fruit and vegetable juice	\$8,811.5	\$624.5	\$40.6	\$9,476.6	0.64%

Source: Mercer analysis, DIRECTEMAR, 2003 US Waterborne Commerce and ACP data.

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

Additionally, a sensitivity analysis determined that the CIF price for fruit and vegetable juice per ton would increase by only 0.64 percent, which is equivalent to US\$ 61.1 per TEU, if the Canal toll were increased by 200 percent. (Exhibit 5-29)

Exhibit 5-29

Sensitivity Analysis for Chilean Juice CIF

Toll increase	50%	100%	150%	200%
CIF price impact	0.16%	0.32%	0.48%	0.64%
New CIF price	US\$9,419.9	US\$9,507.2	US\$9,522.4	US\$9,537.7

Source: Mercer analysis.

5.8.3 Analysis of Commodity Relevance

Given the high value of fruit and vegetable juice, a 200 increase in Canal tolls would have an insignificant effect on the landed cost of this commodity. Furthermore, the cost increase on a liter of this commodity, which is the standard wholesale and retail pricing method, would be even more insignificant. Finally, fruit and vegetable juice exports are relatively insignificant compared to total Chilean exports, thus the impact of a Canal toll increase would not have a significant effect on Chile's trade and economy nor on the industry's role in the Chilean economy.

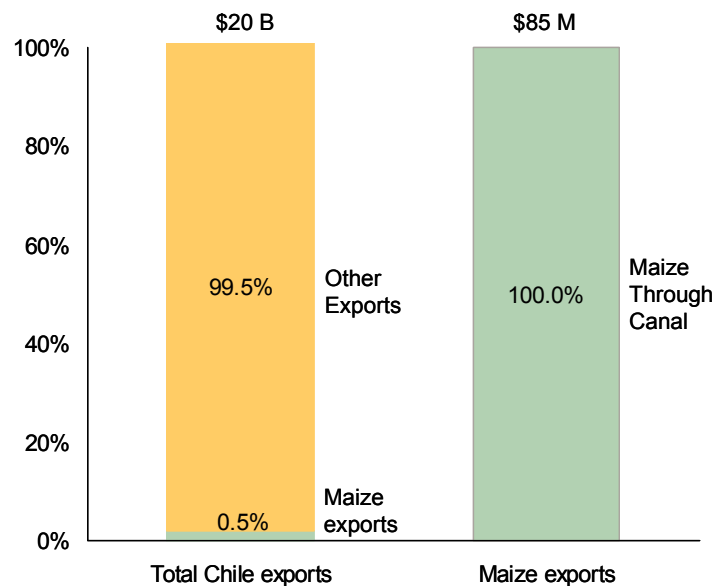
5.9 Cereals

5.9.1 Overview

Chile’s exports of cereal are mainly containerized high-value hybrid maize/corn. In 2003, approximately 2 percent of Chile’s containerized cargo that transited the Canal was hybrid maize²⁹ and approximately 100 percent of Chilean maize was exported by sea, mainly bound for the East Coast of the US; thus practically all Chilean containerized maize transits the Canal.

Total Chilean maize exports in 2003 were \$85 million dollars, which represented 0.5 percent of total Chilean exports (Exhibit 5-30). Chilean maize transiting the Canal represents 100 percent of total maize exports and 0.4 percent of total Chilean exports, in value terms.

Exhibit 5-30
Canal Transit Share of Chilean Maize Exports: 2003
(US\$)



Source: Mercer analysis, DIRECTEMAR 2002, UN Comtrade, US Waterborne Commerce exports data 2003, Eurostat, ACP data.

5.9.2 Panama Canal Cost Share of Landed Cost

Exhibit 5-32 shows the cost components of the calculated CIF for Chile maize exports. Using the methodology described in section 5.1, the analysis found that that Canal cost represents 0.18 percent of Chilean maize CIF.

²⁹ 2003 US Waterborne Commerce Chile imports, Eurostat, ProChile ,ACP Data, DIRECTEMAR, Mercer analysis.

For containerized maize, 2003 US Waterborne Commerce data for containerized Chilean maize was used both for FOB and CIF per ton values. The toll per ton value was obtained using a conversion value of 11.2tons/TEU³⁰ and the Canal Charges per TEU are valued at \$40.6 and Canal tolls at \$30.5 dollars.

Exhibit 5-31

Total Canal Cost Share of Chilean Exported Maize CIF (Landed Cost)
(2003 values in US\$/ton)

	FOB	Charges (Freight & Insurance)	Canal Cost (Toll + OMS)	Total CIF	Canal Cost as % of CIF
Containerized maize	\$21,755.0	\$1,231.8	\$40.6	\$23,047.4	0.18%

Source: Mercer analysis, DIRECTEMAR, 2003 US Waterborne Commerce, ACP data.

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

Additionally, a sensitivity analysis determined that the CIF price for maize would increase by only 0.26 percent, which is equivalent to US\$ 61.1 per TEU, were the Canal toll to be increased by 200 percent (Exhibit 5-32).

Exhibit 5-32

Sensitivity Analysis for Chilean Maize CIF

Toll increase	50%	100%	150%	200%
CIF price impact	0.07%	0.13%	0.20%	0.26%
New CIF price (\$/TEU)	US\$23,062.7	US\$23,078.0	US\$23,093.2	US\$23,108.5

Source: Mercer analysis.

5.9.3 Analysis of Commodity Relevance

Given the high value of containerized maize, even a 200 percent increase in Canal tolls would have an insignificant effect on the landed cost of this commodity. Furthermore, Chile's maize seed producers and exporters are tied to importers in countries like the US and Europe: Chile serves as a manufacturing center for this type of seed due to its lower production costs. Given this market dynamic, it is not likely that there would be major

³⁰ Mercer Management Consulting Demand Forecast Model.

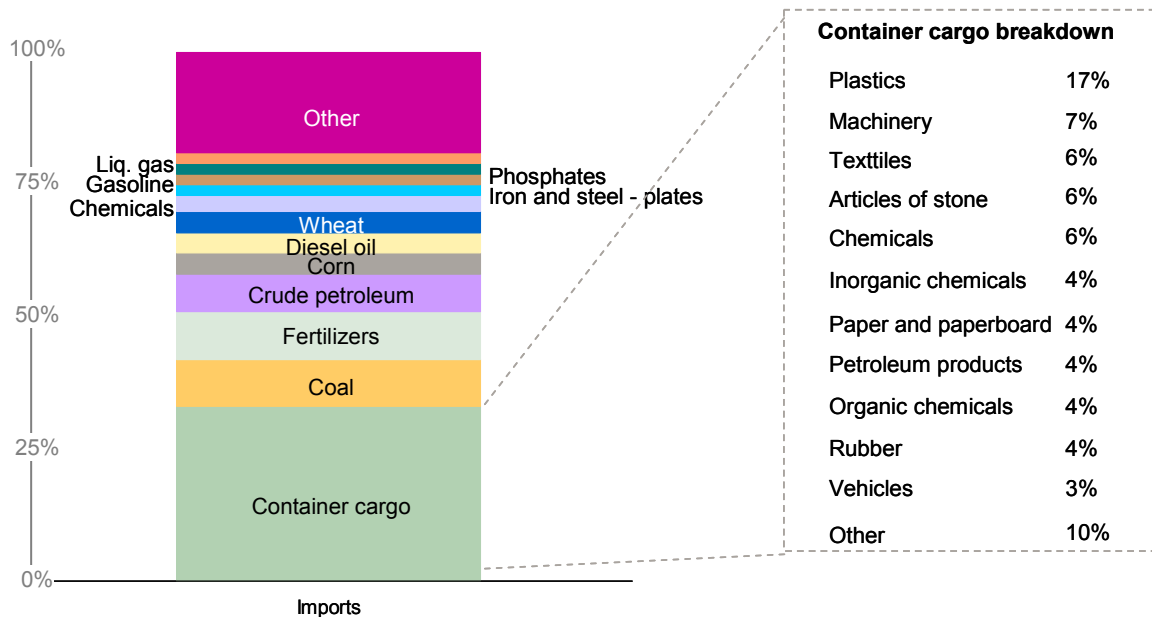
shifts in the short or medium term for Chile’s maize exports.³¹ Therefore, the impact of a Canal toll increase would not have a significant effect on Chile’s trade and economy nor on the industry’s role in the Chilean economy.

5.10 Analysis of Total Relevant Chilean Imports

To ensure a thorough analysis of the effects of an increase in Panama Canal tolls, Chilean commodity imports were analyzed in addition to exports. For the purposes of this analysis, only the most significant commodities, representing approximately 80 percent of Chilean import tons passing through the Panama Canal, were analyzed.

Exhibit 5-33 shows Canal-relevant commodities imported into Chile. Containerized commodities were analyzed separately and only 72 percent of containerized imports are accounted for. Containerized imports were broken down using US Waterborne Commerce export data for 2003 and were compared to imports from Europe,³² given that the mix of European and US exports to Chile are similar.

Exhibit 5-33
1999-2003 Average Canal-Relevant Chilean Imports
 (percentage of tons)



Source: ACP, Waterborne, Eurostat, Mercer analysis.

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 Chile’s economy can be evaluated:

³¹ ANPROS, Asociación Nacional de Productores de Semillas.

³² Eurostat.

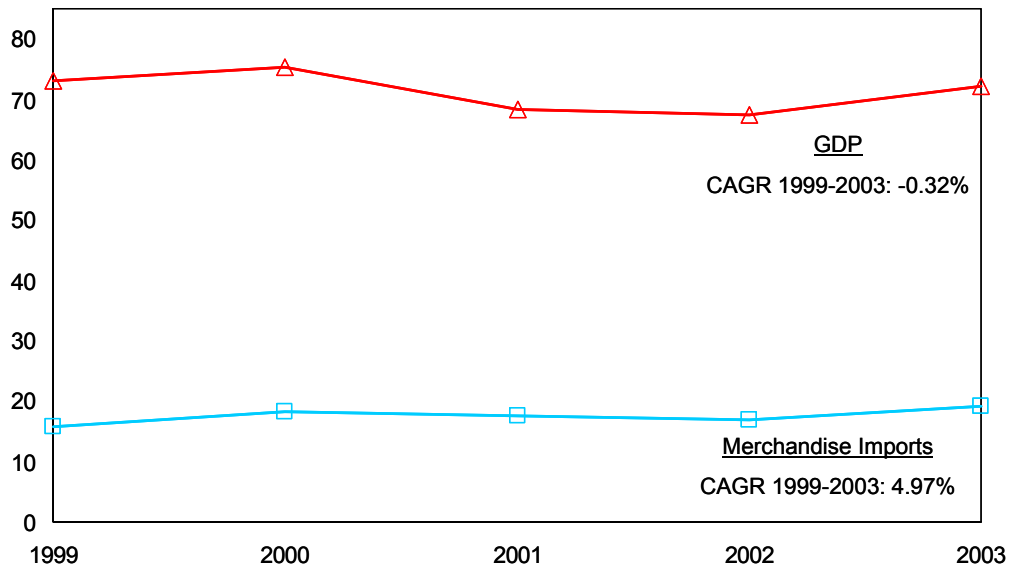
- One approach would be to examine the effect of the Panama Canal toll increases on the final consumer price for all of the relevant commodities imported. This method would evaluate the impact of a Canal toll increase relative to import tariffs, inland transportation costs, distribution and retailer mark-ups, and final state and federal taxes, and would take into account the total impact on Chile'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 Chile's inflation and GDP by performing an analysis to capture the relationship between major Chilean 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 Chilean economy, assuming that everything else is constant. Therefore, a Panama Canal toll increase would be equivalent to a transfer of income from Chile 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 Chile's national income represented by the imports that are passing through the Panama Canal
- The Chilean 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 5-34 shows the relative significance of international imports trade to Chile's economy. During 1999-2003, while goods imports increased by 4.97 percent, GDP showed a slight but insignificant decrease of 0.32 percent.

Exhibit 5-34
Chile GDP and Merchandise Imports: 1999-2003
 (US\$ billions, current prices)



Source: Banco Central de Chile.

As mentioned above, approximately 80 percent of the commodities which are imported to Chile, and transit the Canal, were analyzed in order to determine their share in CIF value of total imports and of GDP. Exhibit 5-35 illustrates the relevant values used for this analysis.

In 2003, Chilean imports transiting the Panama Canal accounted for 20.6 percent of Chile's total goods imports (valued in CIF terms). Additionally, imports transiting the Panama Canal represented only 5.5 percent of Chile's GDP in 2003 (Exhibit 5-36).

Exhibit 5-35

Canal-Relevant Chilean Imports Analyzed

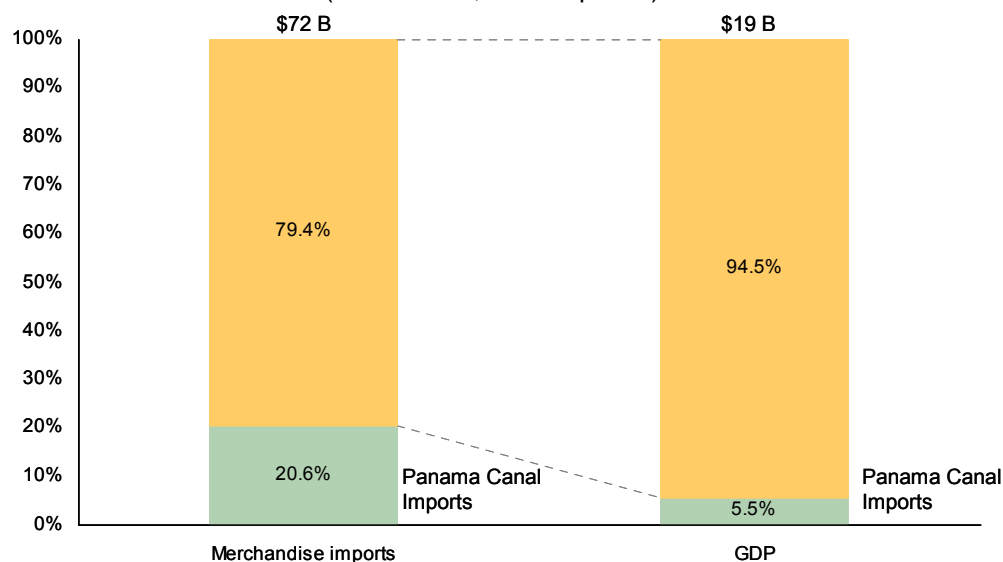
Commodity	Canal Share	Canal Transit Tons 2003	Average CIF/Ton	CIF Value of Canal Transit Tons
Coal	9%	481,969	\$ 38	\$ 18,131,769
Fertilizers, misc.	9%	541,842	\$ 202	\$ 109,221,047
Crude petroleum	7%	194,475	\$ 167	\$ 32,531,948
Corn	4%	52,293	\$ 109	\$ 5,677,592
Diesel oil	4%	167,229	\$ 249	\$ 41,572,340
Wheat	4%	261,956	\$ 175	\$ 45,852,718
Chemicals, misc.	3%	122,171	\$ 137	\$ 16,727,803
Iron and steel	2%	90,234	\$ 410	\$ 36,951,373
Gasoline	2%	47,934	\$ 261	\$ 12,530,370
Phosphates	2%	80,776	\$ 170	\$ 13,764,749
Liquefied gas	2%	17,266	\$ 111	\$ 1,908,824
Container cargo	33%	1,209,240	\$ 2,973	\$ 3,595,058,269
Other	19%			
Total CIF Value of Panama Canal Transit Tons				\$ 3,929,928,801

Source: ACP, 2003 US Waterborne Commerce imports and exports, DIRECTEMAR, Mercer analysis.

Exhibit 5-36

Canal Relevant Imports and Chile's GDP and Goods Imports

(US\$ billions, current prices)



Source: Banco Central de Chile, ACP, 2003 US Waterborne Commerce imports and exports, DIRECTEMAR, Mercer analysis.

In 2003, Chile's merchandise trade deficit (current account) was US\$3 billion, or 4.6 percent of GDP.³³ An increase in imports prices, due to an increase in the Canal toll, will increase the deficit and reduce the national income. Our analysis, however, determined that the impact would be nearly imperceptible – even if tolls were increased by 200 percent for all Chilean imports that transit the Canal, the cost of total goods imports would grow by 0.11 percent and the current account would increase by 0.03 percent of GDP.

With a drop in national income of only 0.003 percent, the impact on inflation would also likely be imperceptible. To put this in perspective, in the case of past oil price shocks, a decrease of 0.4 percent of GDP was needed to generate an 0.5 percent increase in inflation in OECD countries.

The final impact of a price increase in imported goods on the consumer price index (CPI) or the Wholesale Price Index depends on the share of imported goods or inputs in the index. From January to December 2003, the share of imported products in the total wholesale price index was around 25 percent and the share of traded goods in the CPI was 47 percent. This gives a rough idea of the portion of these price indices that could be affected by an increase in imported goods costs. To this we need to add the fact that only a portion of these items will be affected by a Canal toll increase.

The final effect on inflation depends on the extent to which final product prices rise in response to an import price increase. For example, in 2003, 86 percent of CIF goods imports were manufactured goods, and 14 percent were raw materials and inputs. Generally, manufactured goods are more elastic than raw materials. This suggests that there is room for importers to lessen the effect through substitution.

³³ Banco Central de Chile

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 Chilean export and import commodities (with the exception of Chilean exported salt). Therefore, there would be no significant impact on the Chilean economy as a whole.

6.1 Impact of Transit Cost Changes for Exports

For exports, each significant Canal-relevant commodity (13 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 Chilean economy:

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

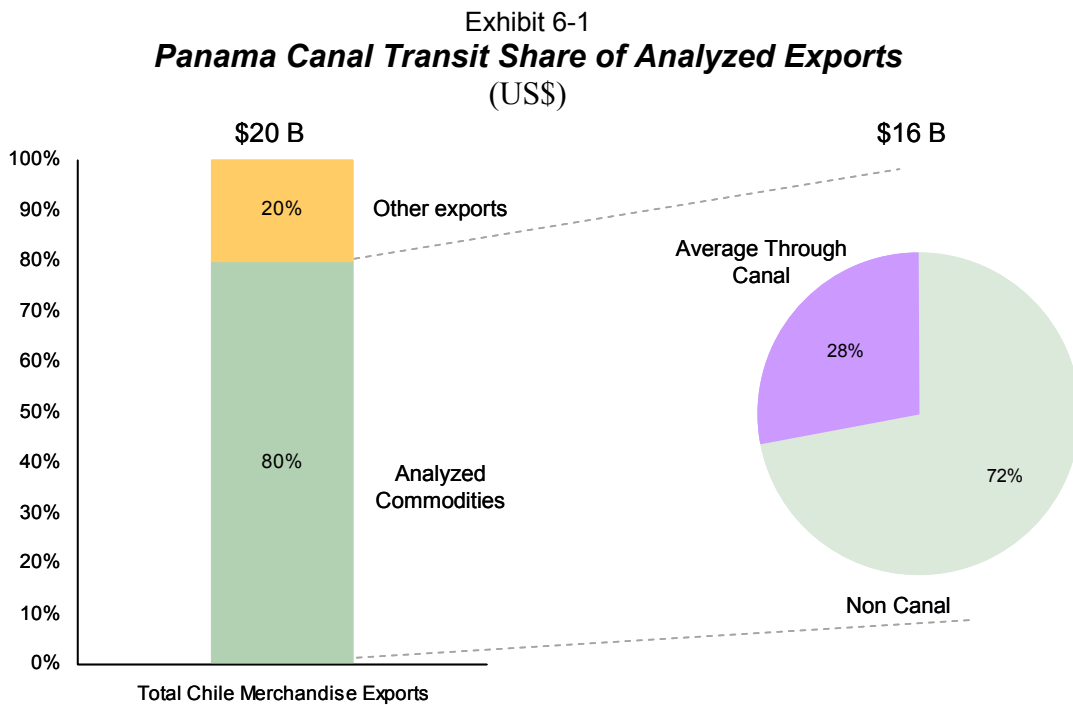
6.1.1 Exported Commodities that Transit the Canal

Of the 13 commodities analyzed in this report, Canal exported quantities account for different shares of each commodities total exports. In some cases, like salt and containerized maize, all of Chile's exported quantities are transported through the Panama Canal. In other cases, only 20-50 percent of that commodity's exports are transported through the Panama Canal, including copper metal, copper ore, fruit, boards and planks,

plywood, juices, and wine. For three commodities; chemicals, pulpwood, and miscellaneous lumber, only 1-5 percent of these commodities' exports are transported through the Canal.

While a significant portion of some commodity exports transit the Canal, none represents a significant portion of total Chilean merchandise exports (with the exception of refined copper, export tons that transited the Panama Canal in 2003 accounted for 9.5 percent of total Chilean merchandise exports).

Exhibit 6-1 shows that the total value of export commodities analyzed in this report represented approximately 80 percent of total Chile merchandise exports in 2003, and that approximately 28 percent of this value transited the Panama Canal. Overall, in 2003, the value of export commodities analyzed in this report represents 23 percent of total Chilean merchandise exports. Panama Canal relevant exports, including all containerized cargo, make up 27 percent of total Chile merchandise exports.³⁴



Source: Banco Central de Chile, ACP, 2003 US Waterborne Commerce imports and exports, DIRECTEMAR, Mercer analysis.

6.1.2 Commodity Importance Relative to Chilean Exports

The exports commodities which were analyzed are not only Canal-relevant but some also represent an important portion of total Chilean exports. In 2003, copper exports accounted

³⁴ 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.

for 35 percent of Chile's total exports, wood products exports accounted for 7 percent and fruit accounted for 7 percent. The other analyzed commodities represent less than 4 percent of total exports each.

6.1.3 Canal Transit Cost Impact on Final Landed Cost

The second phase of the analysis was focused on determining the relevance of the Canal 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, the Canal cost is not a significant portion of the analyzed commodities' CIF; however, given the importance of copper, fruit, and wood to the Chilean economy, further analysis was carried out to understand the potential effects of an increase in Canal tolls on these commodities' demand. Salt was also analyzed on a standalone basis to determine the potential impact of a Canal toll increase.

Copper

As mentioned above, copper exports represent 35 percent of Chilean exports and 28 percent of Chile's copper exports transit the Panama Canal, destined for Europe, the US and Canada. Copper is a high value commodity and thus the Canal cost is a small portion of the total CIF cost, 0.15 percent for refined copper and 0.51 percent for copper ore. As a result, a maximum increase in Canal tolls of 200 percent would impact the refined copper CIF by 0.22 percent and the copper ore CIF by 0.78 percent.

European demand for copper is expected to grow steadily and the trade would appear to be relatively insensitive to tolls, 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 Chile 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 materially affect copper CIF and more importantly, Chilean copper exports. Moreover, given anticipated demand increases from Europe and Asia, the more relevant issue will be Chile's capacity to satisfy this demand.

Fruit

Chile is the seventh largest fruit exporter in the world, and around 70 percent of the fruit that transits the Canal originates in Chile. Chilean fruit exports represent 8 percent of total exports, and around 50 percent of Chile's fruit exports transit the Panama Canal.

Given arrant market dynamics and customer preferences, fruit is transported as bulk in reefer vessels or in refrigerated containers; and a separate analysis by mode of transport was carried out to determine the relevance of Canal cost to Chilean fruit CIF. For bulk fruit, the Canal cost is 1.03 percent of the CIF and for containerized fruit the Canal cost is a much smaller 0.3 percent of the CIF (this difference is mainly due to the difference in FOB and CIF cost between the two modes of transport, with containerized fruit being more costly). As a result, if Canal tolls were increased by 200 percent, the bulk fruit CIF would increase by 1.69 percent and container fruit CIF by 0.45 percent, due to the high value of exported fruit.

Chilean fruit transiting the Canal mainly competes with New Zealand fruit, which would also be affected by an increase in Canal tolls. Furthermore, even though fruit is transported in containers, the majority of fruit is transported as bulk; container share is not expected to increase significantly. Most bulk reefer trade routes are captive to the Canal and reefer trade is not sensitive to small toll increases.

Wood Products

Wood exports account for 7 percent of total Chilean exports. Pulpwood exports in tonnage terms through the Canal were 4 percent of total wood exports in 2002, while boards, plywood and veneer exports through the Canal were 10 percent of wood exports. The relatively minor trade in wood products through the Canal for Chile is indicative of the important demand shift now occurring, away from the US and Europe to Asian countries (mainly China), for which Canal transits are not relevant.

The analysis of Canal cost relevance to the CIF of each commodity revealed that the Canal cost is around 0.75 percent of total CIF. As a result a 200 percent increase in Canal tolls would increase the CIF by a maximum of only 1.5 percent, due to the high value of wood products. For all wood products, the most critical factor for Chilean exports is demand growth from Asian countries. With respect to boards, plywood, and veneers, Chile has become a key source for these commodities for the US and the trades lanes have developed as backhaul for southbound “conbulklers” that carry merchandise south and lumber to the north. In summary, a Canal toll increase of 200 percent would not materially impact wood exports and the Chilean economy.

Salt

Chile's salt exports only account for 0.5 percent of mining exports and around 0.2 percent of total exports. Chile's salt exports are mainly bound for the US, for chemical production, highway deicing and direct consumption, thus around 97 percent of Chile 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 9.15 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 14.21 percent or US\$3.1 per ton. Given that the US has other available sources of supply on the Atlantic side, an increase in the CIF price of salt could significantly displace Chilean imports, however this increase would have to affect CIF price by US\$8, given that the difference between the CIF of imported salt and salt at the mine mouth 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 Chilean economy given that salt is a very minor Chilean export commodity.

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 12 of the 13 analyzed commodities (the exception being salt) represented less than 1.5 percent of the commodity's CIF. Therefore, even with a 200 percent increase in the Panama Canal toll for these 12 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 Chile's Exports	5. Canal Transit Cost Share of CIF	6. 200% Toll Increase Impact on CIF
<i>Bulk</i>						
Salt	\$43.19	97.1%	\$44.50	0.2%	9.2%	14.2%
Copper metal	\$1,969.48	39.4%	\$5,001.06	9.5%	0.1%	0.2%
Copper ore	\$450.98	18.7%	\$2,410.36	2.2%	0.5%	0.8%
Fruit, refrigerated	\$466.50	29.2%	\$1,597.85	2.3%	1.0%	1.7%
Chemicals	\$24.85	1.4%	\$1,744.60	0.1%	1.4%	2.0%
Boards and planks	\$167.32	42.6%	\$393.05	0.8%	0.8%	1.2%
Pulpwood	\$41.21	4.6%	\$895.70	0.2%	1.0%	1.5%
Plywood and veneers	\$38.73	32.0%	\$121.21	0.2%	0.8%	1.2%
<i>Container</i>						
Wood products	\$589.45	48.2%	\$1,223.33	2.9%	0.6%	0.9%
Juice	\$69.67	28.7%	\$243.00	0.3%	0.4%	0.6%
Wine	\$315.70	46.6%	\$676.79	1.5%	0.2%	0.3%
Fruit	\$455.34	28.5%	\$1,597.85	2.2%	0.3%	0.5%
Maize seed	\$93.43	100.0%	\$93.43	0.5%	0.2%	0.3%

Description of columns:

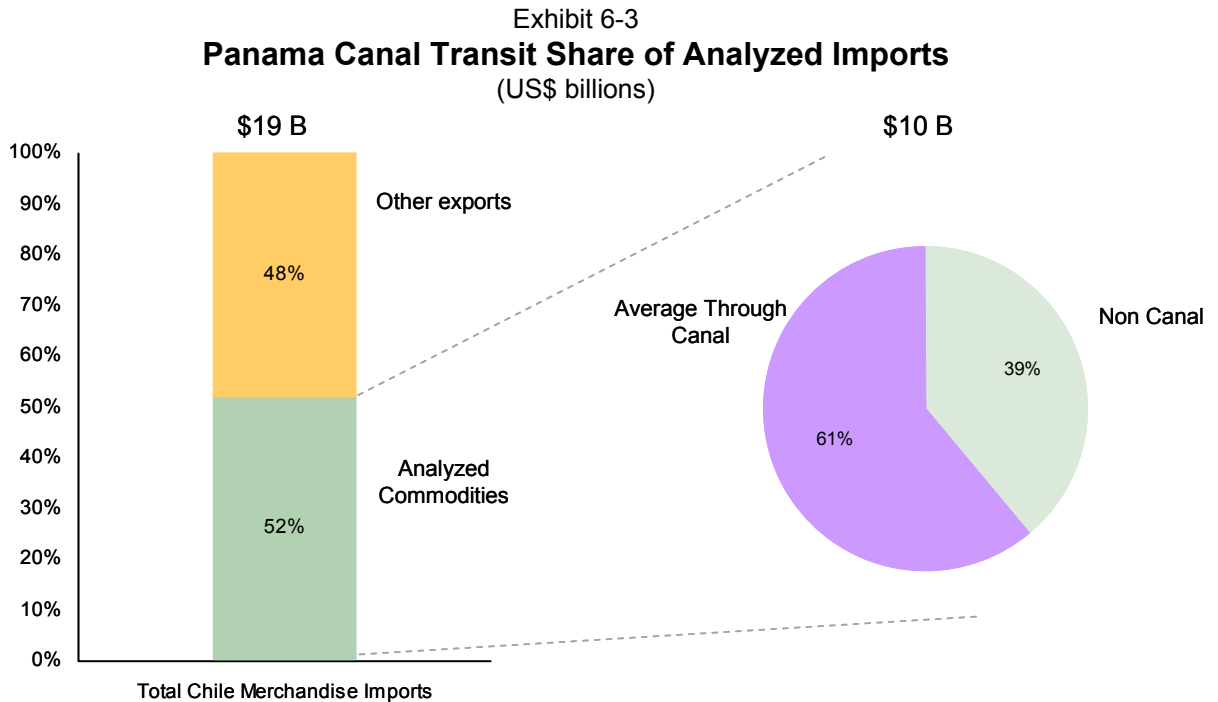
- 1 The merchandise FOB value of the Canal-relevant portion of exports for each commodity
- 2 The percent of the total FOB export value for each commodity that transited the Canal
- 3 The total FOB value of all Chilean exports of each commodity, regardless of transportation mode or route
- 4 The percent of total Chilean 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

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 Chilean imports and on the Chilean 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 Chilean imports and GDP.

In 2003, 52 percent of Chile's total US\$19 billion in import value transited the Panama Canal (Exhibit 6-3). An analysis of Chile's Canal-relevant import commodities determined that the effect of a Canal toll increase on the total cost of Chilean imports and

on GDP would be negligible. If the toll were to increase by 200 percent, the cost of total Chilean imports would increase by only 0.11 percent, with a minimal impact on GDP of -0.03 percent.



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

Considering the very small increase in import cost 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

The effect of a Panama Canal toll increase would not have a significant impact on the Chilean economy, or on the principal industries that provide Canal-relevant export commodities.

For imports, the Canal toll represents a very small portion of the final landed cost (CIF) and the most significant Canal-relevant imports that were analyzed in the report only account for 20 percent of total Chile imports. Additionally, even a large Canal-toll increase would have virtually no effect on the cost of total Chile imports nor on GDP. For exports, even though many of the analyzed Canal-relevant commodities transit more than 20 percent of their value through the Canal, only copper accounted for more than 2.5 percent of total Chile exports. Furthermore, for only one of the analyzed commodities

(salt) the Canal cost represents a significant portion of the CIF, but salt exports are a very small portion of Chile total exports.

Lastly, the larger question facing the Chilean 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 on the critical supply chains that serve the Chilean economy of a deterioration in service - because of increased waiting times or decreased reliability for example - in the event that capacity is insufficient to meet demand would be substantially more important than the cost increases that have been examined. Hence, the consideration of adding capacity to the Canal - recognizing that the capital expense will have to be paid for through tolls - is the more critical issue facing the Chilean economy, rather than the essentially negligible impact of the transit cost increases examined in this study.

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