International Transport Forum

Ports Policy Review of Chile

Case-Specific Policy Analysis

OECD

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The International Transport Forum

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Case-Specific Policy Analysis Reports

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Executive summary

What we did

This report assesses port policies in Chile. It reviews the performance of Chilean ports, analyses current policies and identifies the main bottlenecks to performance within those current policies. Based on this assessment, it offers a series of recommendations that also take into account good international practices relevant for Chile. The report draws on two study visits to Chile, a series of interviews with relevant stakeholders and data made available by these stakeholders.

What we found

Chile has a dual port system with public and private ports. Different ministries are in charge of each: the Ministry of Transport and Telecommunication for public ports and the Ministry of Defence for private ports. The number of private ports increased from 22 in 1994 to 52 in 2014. The number of public ports remained stable at twelve over that period. The proliferation of private ports is facilitated by a legal framework that leaves much discretion to the Ministry of Defence and that is not integrated with Chile's national transport policy. Concessions for private ports are granted without assessment of the investments needed to connect a port to the hinterland. In some cases, private ports have managed to lobby for road connections that the public ports in the same region have not attained yet. Thus, private port development has generated additional costs for the public sector.

Chilean ports – public and private - generally perform well. Some challenges exist, however, with regards to ship waiting times, labour conflicts and hinterland connectivity. Ports in Chile are very dependent on trucks for the connection to their hinterlands. More multi-modality in port hinterland transport is a critical issue for the Chilean ports system. With the volumes that are projected for its ports, in particular in central Chile, better hinterland transport will be essential to avoid congestion in the main port cities and on the main highway axes in Chile. This is acknowledged in Chilean policies: In the plans for the new mega-port in central Chile (PGE) a minimum of 30% rail share in the port-hinterland modal split is mentioned. To achieve this, a paradigm shift would be needed. Yet Chile currently lacks a coherent multi-modal strategy for freight. This shows in various ways including in a lack of investment, no priority for rail freight, governance challenges, underutilisation of private rail networks and subsidies to truck transport.

Coastal shipping is not a competitive transport mode in Chile. It is expensive and there is no extensive network of services, so it can take a long time for shippers to get their goods shipped to the destination. The development of coastal shipping in Chile is hindered by very strict cabotage laws. These laws stipulate that cabotage should be carried out by Chilean-flagged ships and Chilean companies with Chilean crew. Foreign companies can apply for a waiver, but the waiver is connected to high additional costs, bureaucratic procedures, entailing high transaction costs. Foreign companies thus generally do not apply, as there is no business case for them. The result is higher supply chain risks, transport costs and road congestion.

Ports in Chile generally pay limited attention to what happens outside the port area. This lack of external orientation represents a risk for future expansion. One reason for this short-sightedness is that

the legal mandate of a port operator is restricted to the port area. In addition, port authorities are constrained by a lack of financial means, as a large share of their profits is taxed or retrieved, theoretically up to 100%. Although port boards have the mission to ensure that opportunities for expansion are not hampered, the possibilities in practice are limited. Expansion of ports usually only occurs in adjacent zones. It is not impossible to expand ports elsewhere, e.g. through inland terminals, but a special decree is necessary to make this possible. Similarly, the development of dry ports and truck waiting areas is only possible within the municipality in which the port is based. But since most of Chilean ports are located in cities, space for such areas is often not easily available.

Port cities in Chile are generally confronted with the negative impacts of ports without retaining much of the financial benefit of port activities. For example, there are no local port taxes, although the port city's population has to bear most externalities including noise, congestion and pollution. Consequently, the relations between cities and their ports are not without tensions in Chile. So called Port City Committees were introduced in 1997 as a legal mechanism for port-city dialogue, but their implementation has been slow. Chilean cities currently reap only limited economic benefits from their ports. However, there are opportunities here that might be explored, such as creating maritime business clusters that can enhance the port's economic contribution to its surrounding city and region.

The environmental impacts of ports in Chile are not systematically monitored. Thus ports generally cannot inform citizens on their extent and whether they increase or decline. However, such impacts could be substantial. Most of the larger ports in Chile are urban ports, so port impacts touch a relatively large share of the population. There is no international or national framework that provides incentives for green port policies in Chile. There is also a remarkable lack of voluntary green policies by Chilean ports.

What we recommend

Formulate a unified port and logistics strategy for Chile

In order to solve the fragmentation of the ports system that leads to lower maritime and port connectivity than would be achieved in a more concentrated port system, the following measures could be considered:

- Establish a national hierarchy of ports, whilst not hampering the private sector's ability to react and invest quickly. Possibly decentralise the responsibility of public ports that are not of national interest to sub-national governments.
- Develop a national freight strategy for the whole of government, to make ports part of a logistics network.
- Make maritime concessions, issued by the Ministry of Defense, a joint responsibility of the Ministry of Defence and Ministry of Transport and Telecommunications.
- End maritime concessions in case the concession is not used; stop the practice of extending concession periods when there is no activity.
- Make private ports pay for the infrastructure needed to connect the port with the hinterland. Require private ports to publish the prices of services offered to third parties, and make them non-discriminatory. Consider extending the application of principles for public ports, such as transparency and non-discrimination of port users, to the private port sector.

Introduce performance incentives for pilotage

In order to improve the performance of pilotage the following measures could be considered:

- Provide incentives to pilots in order to improve performance and reduce inefficiencies.
- Define objective criteria for port closures.
- Consider introducing competition in the field of pilotage.

Develop a long-term joint port labour agreement

In order to increase stability and performance of port labour the following measures could be considered:

- Optimise the labour legislation for dockworkers, with a view of convergence towards the general labour regime in Chile and stimulating permanent employment.
- Improve basic worker conditions, such as health insurance and maximum working hours.
- Develop a more consensual culture of negotiations.

Liberalise cabotage

In order to stimulate coastal shipping as an effective transport option the following measures could be considered:

- Implement exemptions from cabotage regulations in case a port closure prevents a ship from making a call in that port.
- Cancel current fiscal punishments for foreign firms (a 6% penalty and an additional 20% tax on the ship lease value) that would like to bid for a waiver from the cabotage regulations.
- Open up exemptions for certain cargo types. Promote pilot programmes, to see if there is a market and what are the impacts of liberalisation.
- Open up cabotage for a selected number of main ports, while ensuring the connectivity of remote regions.
- Start a discussion within the Pacific Alliance on a supra-national cabotage policy.

Create a level playing field for all hinterland transport modes

In order to stimulate the emergence of multi-modal freight transport solutions the following measures could be considered:

- Formulate an ambitious action plan to increase rail freight.
- Phase out subsidies to truck transport.
- Roll out port gate reservation systems and incentive programmes to improve smooth cargo flows to and from the port gate.
- Provide incentives for trucks to come at off-peak hours.

Modernise port governance

In order to provide port authorities with more possibilities to implement the policies mentioned in this report the following measures could be considered:

- Extend the mandate of port authorities, both spatially and in terms of authority.

- Provide port authorities with more instruments, e.g. more possibilities to retain revenues from port activities.
- Conduct an annual study on the economic impacts of ports in Chile.
- Stimulate concession design that promotes wider societal gains.

Create a framework for green ports policies

In order to mitigate the negative environmental effects of ports the following measures could be considered:

- Set up a continuous port air measurement programme.
- Define main targets for environmental performance of ports, including on air emissions.
- Develop a comprehensive approach on tackling air emissions from port activity.
- Give room to ports to develop their own instruments.

Improve port-city relations

In order to improve the relations between ports and cities the following measures could be considered:

- Strengthen the co-operation between cities and public ports.
- Come up with schemes that give cities a share of port revenue.
- Stimulate opportunities to use the port as a driver of local economic development.
- More closely co-ordinate port and urban planning.

Chapter 1. Chilean ports: Performance and impacts

Chile's economy is highly dependent on maritime trade. Chile's exports account for 38% of GDP (above the OECD average of 27%), and about 95% of its external trade is handled through ports (OECD, 2015). The Chilean coast stretches along over 4 200 km of coast, and is characterised by the scarcity of bays and sheltered waters. One of the specificities of the Chilean port system is the co-existence of public and private ports.

Public ports are public companies created by the law n°19 542 of 1997, to replace the state company Emporchi. They are administered by a Directorate appointed by SEP, the government agency overseeing the Chilean state-owned companies. The Ports Law n°19 542 provides the public ports with the following mandate:

1. Promote competition within ports.
2. Ensure non-discriminatory treatment to users of ports and terminals.
3. Ensure that the possibilities of development and expansion of ports are not constrained.
4. Preserve and strengthen the levels of productivity, efficiency and competitiveness achieved in the port operation.

The same law provides that the State, represented by the Ministry of Transport and Telecommunications, shall propose strategic plans of the state port system and improve efficiency and competitiveness of the public ports.

Private ports are not regulated by the same law, but by a decree with legal force: DLF 340 on maritime concessions. The main differences with public ports consist in that they are legally allowed to refuse clients; they can use price discrimination in their tariffs and are not subject to the structural and behavioural safeguards established by the Free Competition Court. Sometimes a distinction is made between private ports of public use and private ports of private use. This last category of ports provides exclusive services to one or more specific companies, making their existence dependent on its level of activity. Most private ports belong to vertically integrated mining or industrial firms. Private ports of public use handle not only cargo of the port owner, but also third party cargo. However, the difference between private ports of public use and private ports of private use is blurred, because private ports of public use are not obliged to accept every client, and private ports of private use can handle cargo from any client if they want to. As a result, private ports are not strictly of private or public use.

Overall, there are 92 ports in Chile, but according to stakeholders this number varies between 50 to over a hundred. The uncertainty on this number comes mainly from private ports, because new private ports can pop up from one year to another. It also depends on the definition of a port. The number of public ports has been stable since 1997 while the number of private ports has gradually increased in recent years. Most public ports (Figure 1.1) and private ports of public use are multipurpose. Private ports of private use tend to be more specialised. Public ports handled 32% of the total port volumes in 2015, compared to 38% for private ports for public use and 27% by private ports for private use – the remaining 3% is handled by so-called connectivity terminals in southern Chile and island areas. The public ports are generally the busiest ports. This can be deducted from an analysis of monthly ship calls in Chilean ports.

Figure 1.1. **Public ports in Chile**

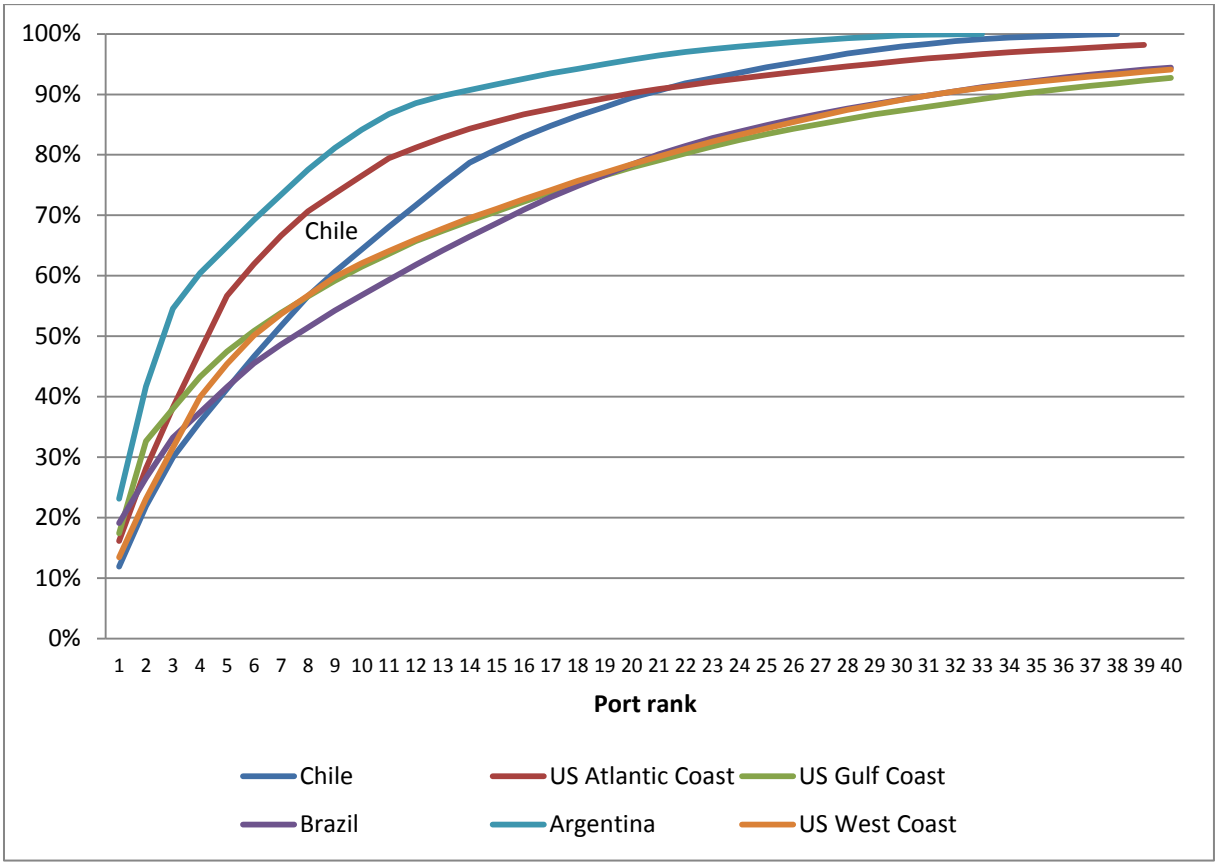
Source: www.AAPA2015.com.

Chile's port system is characterised by a relatively large amount of medium-sized ports. This can be concluded from an analysis of the accumulative market shares of cargo handled by ports according to port rank. This analysis was conducted for countries with comparable large coastlines, such as Brazil and Argentina, and for the different coastlines of the United States (West Coast, Atlantic Coast and Gulf Coast). The market share of the largest five ports is approximately 40% in Chile, which is the lowest share of the benchmark coastlines; the highest score in this respect is Argentina, where the top five have 65% of the total cargo handled in their national ports. What is unique in Chile is the form of its slope (Figure 1.2). Whereas its concentration rate for top five ports was relatively low, this is not the case for the top 15 ports, where Chile is among the cases with the highest concentration rates; lower than Argentina and the US Atlantic Coast, but higher than Brazil and the US Gulf Coast and West Coast. What can be deduced from this figure is that, in contrast to these benchmark cases, Chile has a large amount of medium-sized ports, but its largest ports are not really that large.

The type of cargo handled in ports differs according to the region. The north is specialised in mining products, especially copper, iron and coal. It is increasingly exported in a containerised form, and less as break bulk. The ports of the central region move containers and agricultural products. The central region of Chile, around the capital city Santiago, is the main consumption centre as it accounts for 66% of the total population and 60% of the GDP. More than half of shipping tonnage (for public ports) takes place through ports in the region. Ports in the south specialise in the export of fruits and forestry products.

Their activity tends to increase because of the rising demand for perishable products, especially fruits. Consequently, there is more need for reefer transport capacity. Chile is the second exporter of perishable product in the region after Ecuador (Wilmsmeier, 2013). Finally, in the southern-most part of the country and in island zones, maritime transport is the only transportation mean for both cargo and passengers.

Figure 1.2. **Accumulated monthly port calls of selected countries**

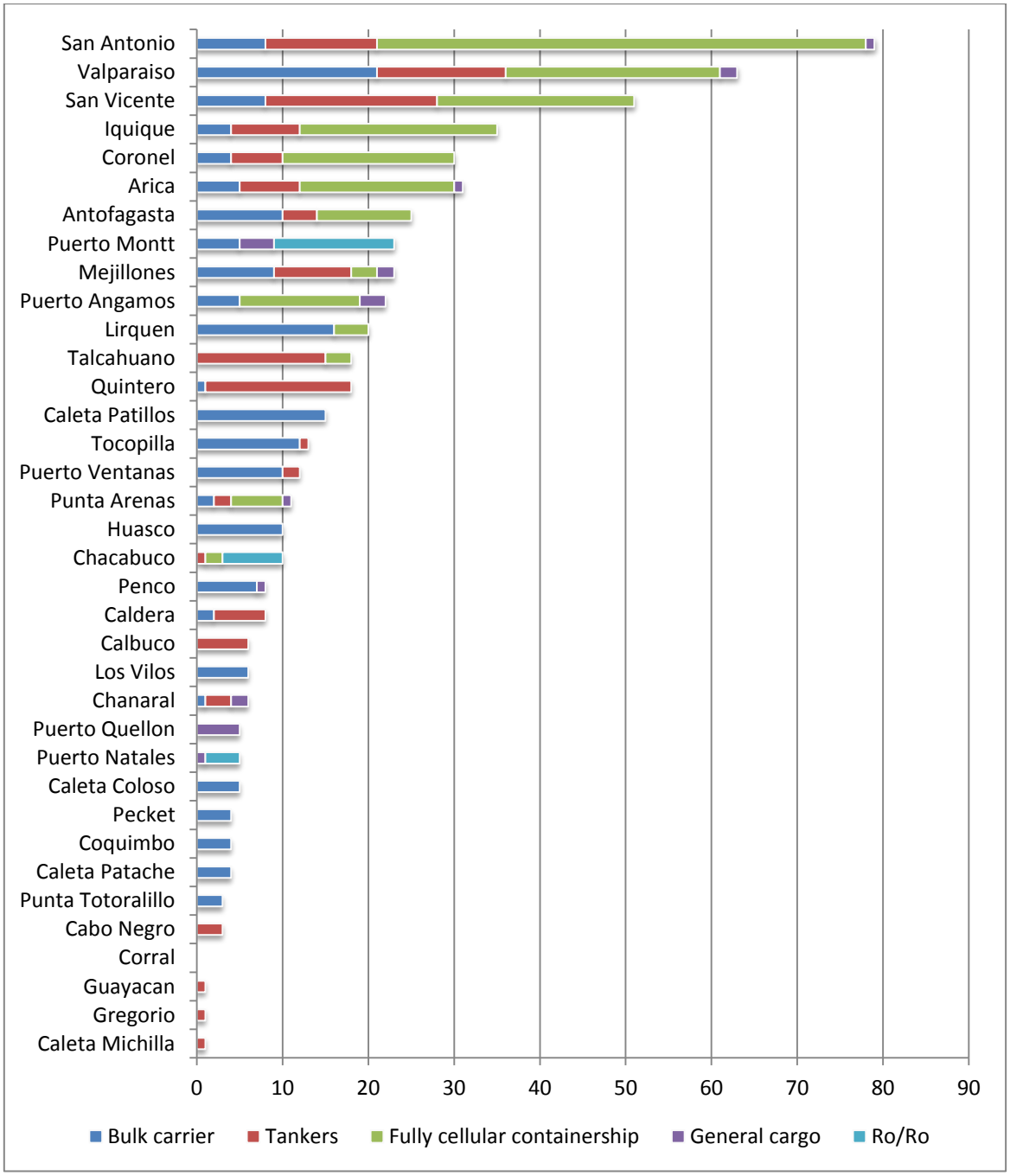


Source: ITF/OECD based on data from Lloyds Intelligence Unit.

Most of Chile's exports consist of copper products, representing over 57% of exports. The main destinations of the Chilean exports are China, the US, Japan and Brazil. Chile's imports, on the other hand, are mainly oil and its derivatives, chemicals, electronic equipment, industrial machinery and vehicles. Imports come from the US, China, Argentina and Brazil. In 2013, exports via Chilean ports amounted to 56.7 million metric tonnes and imports to 51.6 million metric tonnes. Most of exports were solid bulk (35.9 million metric tonnes) and most of imports were liquid bulk (21.9 million metric tonnes) (Sabonge and Lugo, 2014).

Many Chilean ports, such as the mining ports of the north, like Antofagasta, export containerised mining products (like concentrated copper), but do not import containerised consumer goods which are trucked from the central region. Indeed, Antofagasta would have the capacity to handle container imports but its priority is to export mining products, while ports from the central regions are more focused on handling containers. Due to this imbalance, some ports – like Antofagasta – need to import empty containers, an issue that will be addressed later in the report.

Figure 1.3. **Specialisation patterns of Chilean ports (2015)**



Source: ITF/OECD based on data from Lloyds Intelligence Unit.

There are large differences in terms of specialisation between the different ports in Chile. The largest ports in Chile are all diversified, handling containers, but also liquid and dry bulk. Some of the smaller ports are more specialised, in some cases only handling one type of ships, which is the case for various private mining ports only handling bulk carriers (Caleta Patillos, Huasco, Caleta Coloso, Pecket, etc.). Among the largest ports in Chile, containers clearly represent the largest share of ship calls in San

Antonio (almost 75%). Other ports with large shares of container ship activity include Valparaiso, San Vicente, Iquique, Coronel and Arica (Figure 1.3).

Coastal shipping represented 19.7% of tonnes moved in national ports in 2013 (13.7 million tonnes in 2013). 54.3% of cargo moved by cabotage is liquid bulk, 17.4% is general cargo, and 28.4% is solid bulk (Camport, 2015). Main clients are Codelco and ENAP. Codelco moves about 1.6 million tonnes of sulphuric acid from central ports to the north, and ENAP moves gas between its refineries in Concon and San Vicente. Coastal shipping is also crucial for passengers' connectivity in the very south of the country, in the Juan Fernandez archipelago and the Easter Island (Camport, 2015). In these regions, coastal shipping is essential to ensure that the people who live there have access to quality transportation services. In some cases, access to medical services depends on the availability of publicly provided infrastructure and transportation services. This makes coastal shipping an important service for promoting equality among people in Chile.

Relevant port stakeholders and regulators

Port governance is influenced by a wide number of actors. More than 30 organisations deal with the port system. The main entities likely to generate or influence port policies include five ministries. First, the Ministry of Transport and Telecommunication (MTT), more specifically the Logistic Development Division (2010) within the sub-secretary of Transport has the mission to develop an integral view of freight transport modes to improve the competitiveness of external trade. A specific team for maritime and port issues was created within the Logistic Development Program (PDL).

The Ministry of Public Works (Ministerio de Obras Publicas, MOP) plays a central role for the provision of ports infrastructure through the Direction of Port Works. Its aim is to develop infrastructure projects, either directly or via third parties. This mandate has covered coastal works, infrastructure to improve connectivity at the land-side and fishing coves. With regards to port infrastructure projects, it acts as a technical body that reviews projects.

The Ministry of Defence (MOD) is in charge of the regulation of navigation on waters under national jurisdiction, through the Chilean Navy and its General Direction of Maritime Territory and the Merchant Marine (DIRECTEMAR). Its main goal is to ensure security in the maritime territory. The provision of maritime concessions and aquaculture falls under the mandate of the Undersecretariat for the Armed Forces of the Ministry of Defence.

The Ministry of Finance (MOF) is involved in maritime trade, mainly through its Integrated System of External Trade (SICEX). The mission of SICEX is to reduce time and costs of import/export operations thanks to the use of data and new technologies.

The Ministry of National Assets (Ministerio de Bienes Nacionales, MBN) is in charge of managing the fiscal patrimony of Chile and oversees the national assets of public use. This ministry can sell land or grant concessions to private entities, as well as grant free concessions to support industrial or productive projects –for example port authorities to develop a dry port. It plays a role in the administration of coastal zones because it has control over fiscal land located more than 80 m away of the territorial sea –except when this land is privately owned.

In addition to the ministries, the Public Companies Organisation (*Sistema de Empresas Publicas*, SEP) is the co-ordination agency of public companies, including the ten public port authorities. The SEP serves the state as a technical body to oversee state-owned companies. Its mandate includes the power to appoint the directors of these companies, as well as the validation of the fundamental statements of

companies, concerning their mission and business area; reviewing and reporting on the strategic plans of companies; reviewing and reporting on the draft annual budgets and budget requests for modification of companies, prior to submission to the Ministry of Finance.

The ten state-port companies, referred to as public ports in this report, are public companies with their own assets (*patrimonio propio*). They function under the regulation of private companies. Following the Landlord Model, they are in charge of the administration and regulation of the port, as well as the attribution of concessions to private operators on terminals. They influence policies through the redaction of a master plan presenting their future projects.

Other organisations that may influence policies and strategies include:

- other ministers: the Ministry of Economy, the Ministry of Labour, the Ministry of Urban Planning, the Ministry of Agriculture
- regional governments and municipalities, especially those gathered under the National Association of Port Cities
- local communities
- labour organisations and trade unions
- the Maritime and Port Chamber, the Chilean National Association of Shipowners (ANA), the association of truck owners, logistic and transport companies, the Logistic Association of Chile (ALOG), shipping companies, terminal operators, port services providers, shipyards.

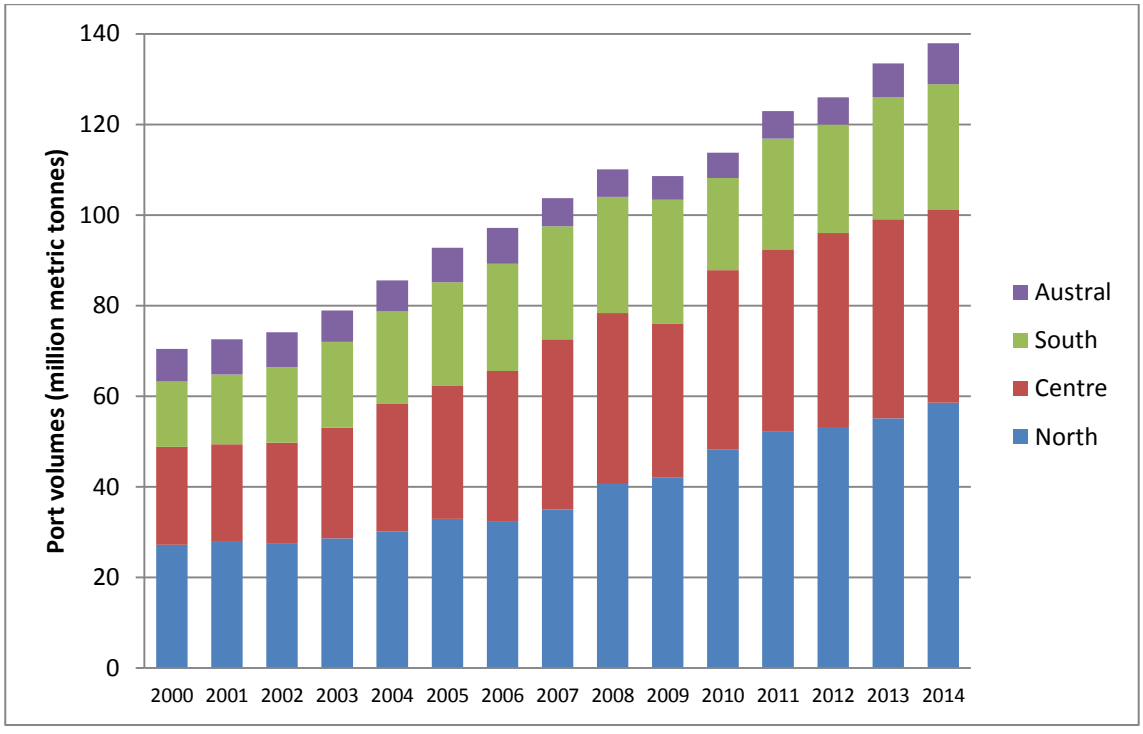
Performance: Maritime, port and hinterland

In 2014, ports in Chile handled 138 million metric tonnes of goods, 42% of which were handled in the north and 31% in Central Chile. Port volumes over 2000-2014 almost doubled. Port growth has been somewhat uneven throughout the country: faster in the north (115% over 2000-2014), much slower in the Austral region (26%) and in line with the national average in the Centre (96%) and South region (93%). The largest Chilean ports in terms of tonnage are Quintero, San Vicente (both 15 million tonnes in 2014) and San Antonio (13 million tonnes). The ports with the highest growth rates over 2000-2014 are Mejillones (376%), Valparaíso (160%) and Coronel (151%) (Figure 1.5).

Container volumes

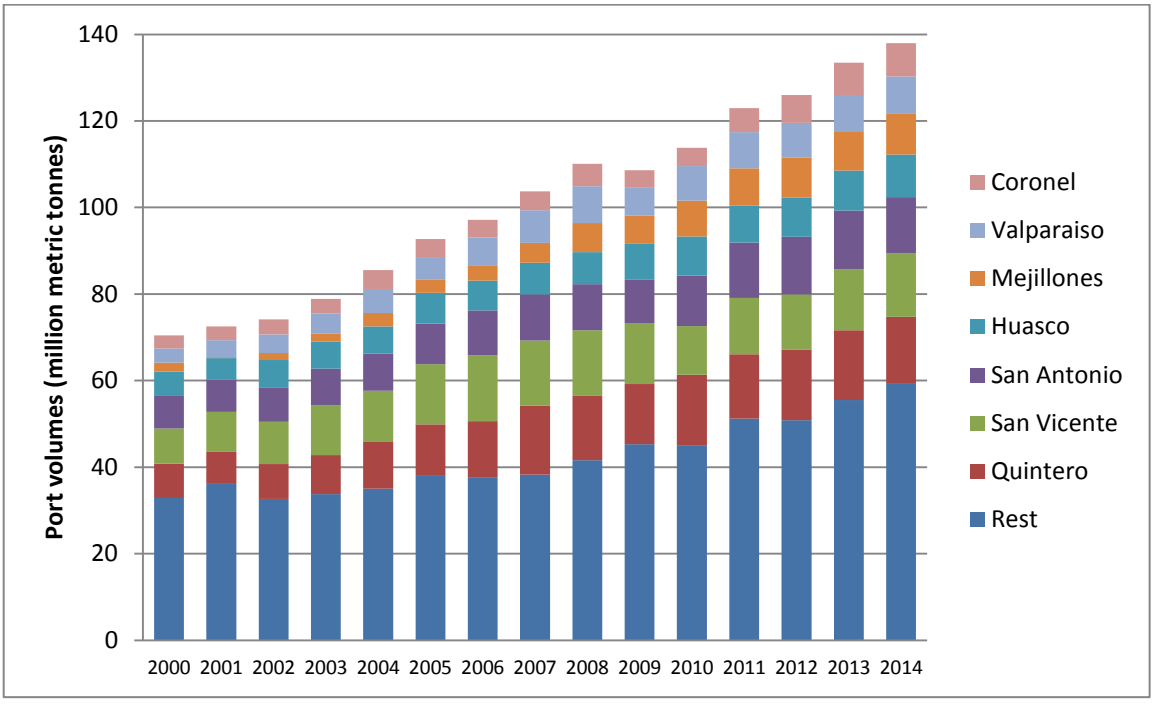
The largest container ports in Chile (San Antonio, Valparaiso) are relatively small in Latin American perspective. San Antonio ranks ninth in terms of TEU volume, slightly above 1 million TEUs, three times less than the biggest container ports in Latin America, Santos (Brazil) and Balboa (Panama). Although it has more than doubled its volume over 2000-2014, its growth actually lags behind main competitors on the west coast of South America, such as Guayaquil (Ecuador) and Callao (Peru) (Figure 1.6).

Figure 1.4. **Development of main port regions in Chile (2000-2014)**



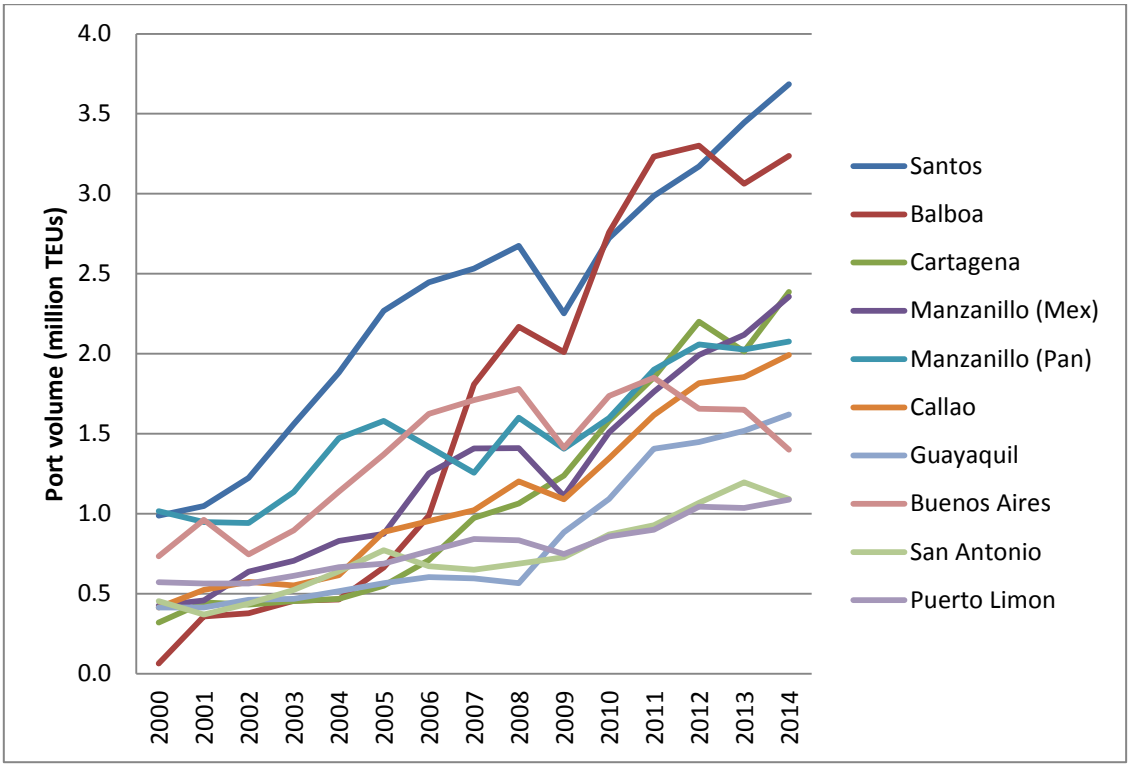
Source: ITF/OECD based on data from Directemar.

Figure 1.5. **Development of main ports in Chile (2000-2014)**



Source: ITF/OECD based on data from Directemar.

Figure 1.6. **Top 10 Latin American container ports (2000-2014)**



Source: ITF/OECD own data collection based on data from port authorities.

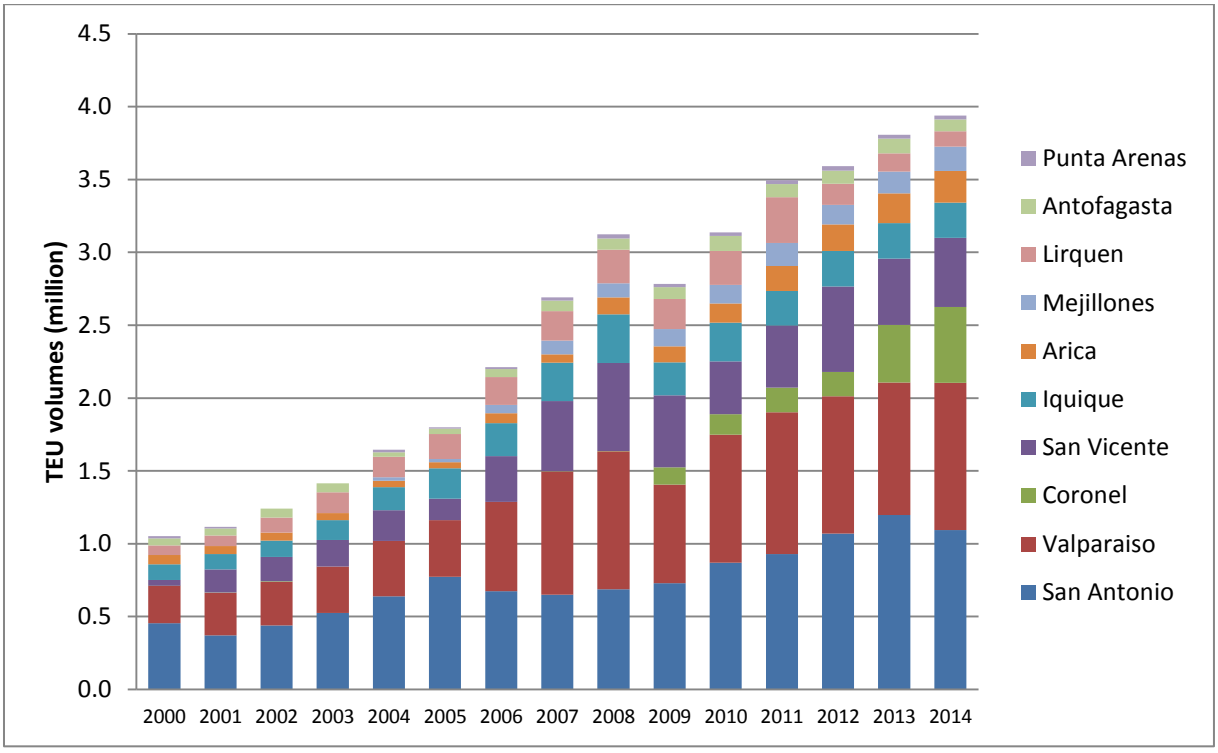
Chilean ports handled in 2014 almost 4 million TEUs. This is almost four times the volume handled in 2000. Half of the Chilean container volume is handled by two ports: San Antonio and Valparaiso. Over this period the volume of Valparaiso tripled and Coronel and San Vicente emerged as important container ports. For some of the smaller container ports, such as Lirquen, Antofagasta and Punta Arenas, growth was fairly moderate over this period (Figure 1.7).

Maritime access

Ports in Chile have mediocre scores on maritime accessibility. This can be concluded from Chile's score on the Liner Shipping Connectivity Index (LSCI) of the UN Conference on Trade and Development (UNCTAD), designed to measure the market access of a country. It is calculated based on the number of container ships stopping in the country, the nominal capacity of these ships, the number of shipping lines placing container ships in the ports of this country, the number of liner services and the size of the biggest ship ports can accommodate. According to this index, Chile ranks eighth in Latin America and 43th in the world. At the national level, San Antonio has the highest connectivity index, followed by Iquique, Valparaiso and San Vicente.

There is some concern regarding ships' waiting times before entering ports in Chile. In the San Antonio Terminal Internacional (STI) and Terminal Pacifico Sur (TPS) of Valparaiso in 2011, the ratio of waiting time/service time for vessels entering the port was 16.8%, whereas 10% is considered the "best practice reference" (OECD, 2015). In addition, there is a relatively large amount of days of the year that ships cannot enter the port related to pilotage.

Figure 1.7. **Development of container ports in Chile (2000-2014)**



Source: ITF/OECD own data collection based on data from port authorities.

The largest ships are employed on Far East services with average TEU capacities between 6 300 and 9 300 TEU and average maximum ship draughts between 13.3 m and 14.6 m. Given the continuing disproportionate fleet growth in the upper size segments, operators will be tempted to use ships currently employed on other routes (North America-Far East or even Europe-Far East) on South America trades. Through the cascade effect, this ship size increase will also affect South America trades. On Latin America-Asia trades, we may soon see the first 18 000 TEU vessels trickling down from the major east-west trades. The first 20 000 TEU vessels on this route might be observed by 2025 (Annex 1).

Port operations

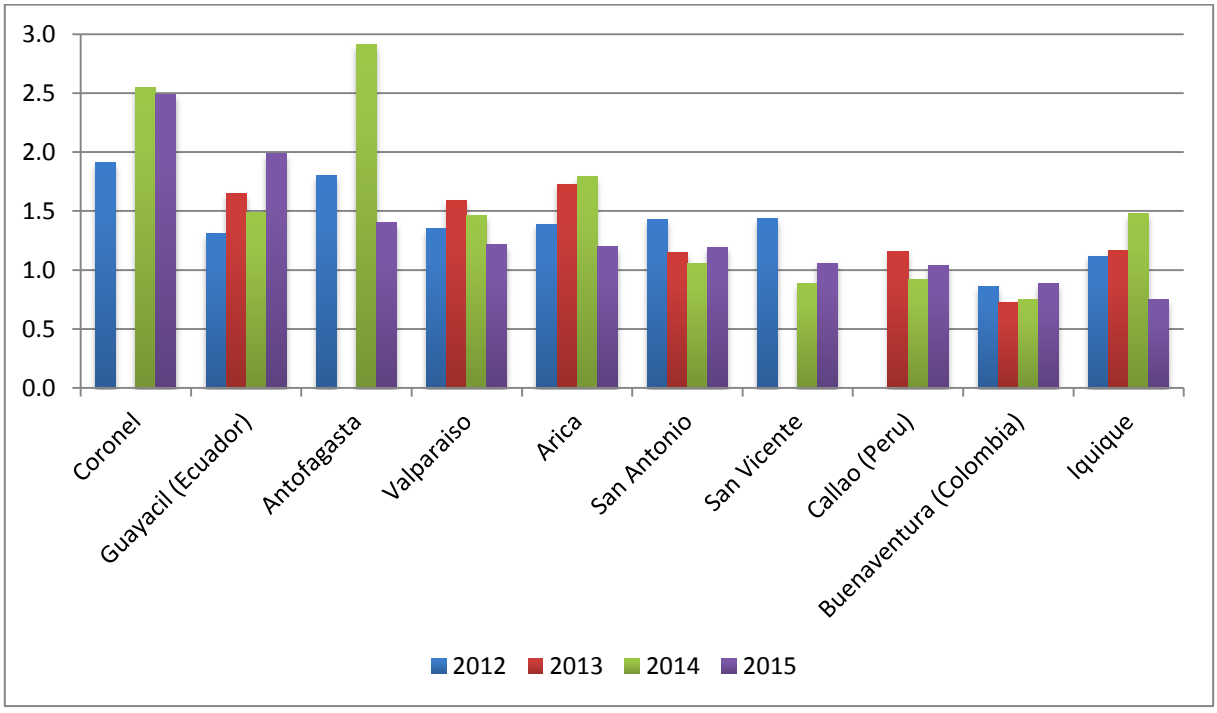
The average container ship turnaround time in 2015 in San Antonio and Valparaiso was slightly above one day. This is in line with the global average for container ports. In terms of regional competitors, both Callao and Buenaventura have ship turnaround times that are lower, not only in 2015, but consistently over 2012-2015. Both in San Antonio and Valparaiso the average ship turnaround time has gone down over this period. The Chilean port that has very strong performance on this indicator is Iquique; the port with long turnaround times is Coronel (Figure 1.8).

Berth productivity of the main container ports in Chile is unproblematic. According to the study conducted by Drewry Research on the performances of 500 terminals around the world (2011-2013), only the port of San Antonio exceeds the global average productivity of 1 072 TEU per metre of quay. Both Valparaiso and San Antonio exceed the global average in terms of TEU/crane. When looking at terminals, San Antonio Terminal Internacional has the highest quay productivity with 1 449 TEU per

metre, followed by Terminal Pacifico Sur in Valparaiso with 877 TEU per metre. Berth productivity more than doubled over the last decade, according to ECLAC (2015).

Truck waiting times are high; it is estimated that a truck transporting fruits from the Curico zone to ports in the central region may take 28h for a round trip, with 7h driving and 21h waiting (Camport, 2015, citing a study of KOM). More generally, charged trucks only drive during 10% of the time of the total trip (and 20% during the high season for trucks), while the rest of the time is spent waiting.

Figure 1.8. **Ship turnaround time main container ports Southwest America (2012-2015)**



Source: ITF/OECD based on data from Lloyds Intelligence Unit.

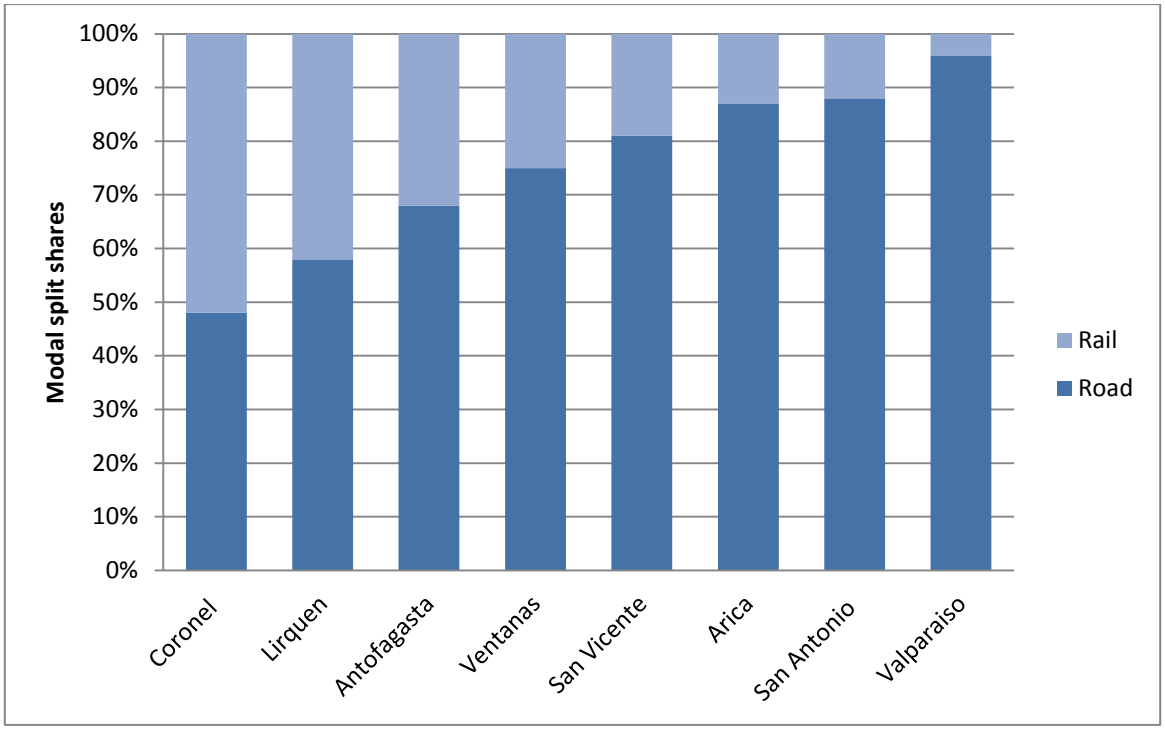
Port hinterland connectivity

Chile has a total railway network of 4 636 km length (MTT, 2007), and a road network of over 80 500 km. Port hinterland connectivity goes mainly by road, as rail freight represents less than 10% of total land freight - by contrast, in OECD countries, rail freight represents about 40% of total cargo. A few ports do not have any rail access because there are no operative railways south from Puerto Montt – hence no connections in Chacabuco, Puerto Natales and Punta Arenas. As the modal split shows, the share of rail in port access is low especially in southern and central ports like Valparaiso, San Antonio and San Vicente (Figure 1.9). The importance of rail's share is linked to the nature of goods carried; mining ports in the north (like Antofagasta) and timber ports in the centre/south (like Coronel) have the larger share of their cargo transported by rail.

A specificity of the Chilean railway system is its division between a private network in the North and a public network in the rest of the country, property of the national company EFE (*Empresa de los Ferrocariles del Estado*). Within this framework, EFE operates the transport of passengers, and two companies (Fepasa and Transap) operate freight transport. In the northern network, most of the infrastructure belongs to the company Ferronor, which allows other users to operate on its railways

(public use). Similarly, the company FCAB allows public use. In addition, there are a few branches whose infrastructure belong to private companies (mainly mining companies), and are reserved to their private use. Although the system has evolved towards a more deregulated structure, the 1931 Railway Act regulates multiple issues and draws a vision of a state empowered to supervise operations.

Figure 1.9. **Modal shares of public ports in Chile**



Data source: ITF/OECD elaborations based on MTT (2011.)

Table 1.1. **Public and private freight rail**

	Public tracks	Private tracks
Public services	EFE	FERRONOR
	FEPASA (subsidiary of EFE)	FCAB
	Transap (private concessionaire)	
Private services	-	Ferrocaril de Tocopilla al Toco (SQM)
		Codelco
		Compania Minera de Pacifico (CMP)

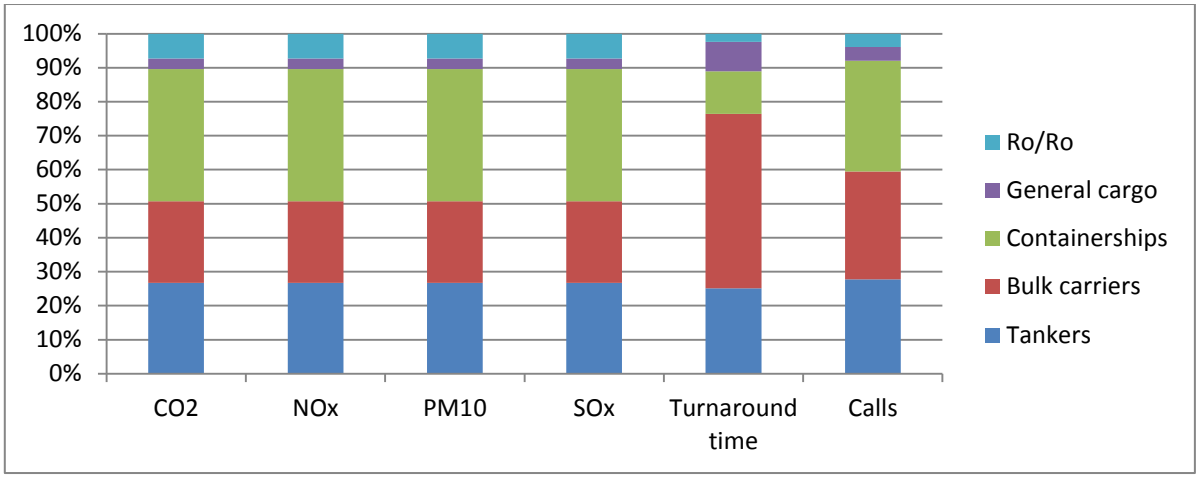
In practice, in the north, Ferronor only uses 15% of the tracks (MTT, 2011), while the rest is abandoned. The MTT's diagnostic also underlines that there is no multimodal system in freight transport, except for island zones and for large and homogeneous cargo. Multimodal transport for containers is very limited because the volume is not big enough and adequate infrastructure is lacking (MTT, 2007).

Impacts: Jobs, pollution, traffic congestion

Economic impact studies for ports in Chile are fairly rare, and ports do not systematically report on their economic impacts. A study on Valparaiso was released about port-related jobs, value added and public revenues (Universidad de Valparaíso, 2008); it was estimated that port activity generates 16 700 direct and indirect jobs in the region and contributes 5.3% of regional GDP. A more recent study (Jadresic and Villena, 2014) assessed the economic impacts of the construction of the terminal Cerros de Valparaiso (TCVAL).[1] Merk (2013) estimated local employment related to the port complex of Mejillones and described the interlinkages of the port complexes of Antofagasta and Mejillones with the local copper mining industry.

Information on environmental impacts from ports is also scarce. There is no obligation for ports to publicly report on environmental impacts, so little is known about these. The port of Arica and its concessionary TPA are an exception in this respect with their calculations on carbon footprint conducted in 2010, 2011 and 2013 that take into account the emissions from port operations, ships and trucks coming to the port. According to their studies, total emissions of TPA in 2013 reached 23 326 tonnes of CO_2 equivalent, the majority of which caused by vessels coming to the port. The United Nations Environment Programme (UNEP), Climate and Clean Air Coalition and Centro Mario Molina de Chile conducted a study on air pollutant emissions (NO_x, PM and BC) in the port of Valparaiso, due to ground transportation, cargo handling and ships. This study indicated how ships are responsible for a large share of the PM and BC emissions in the ports, whereas cargo handling equipment represents a large share of the NO_x emissions.

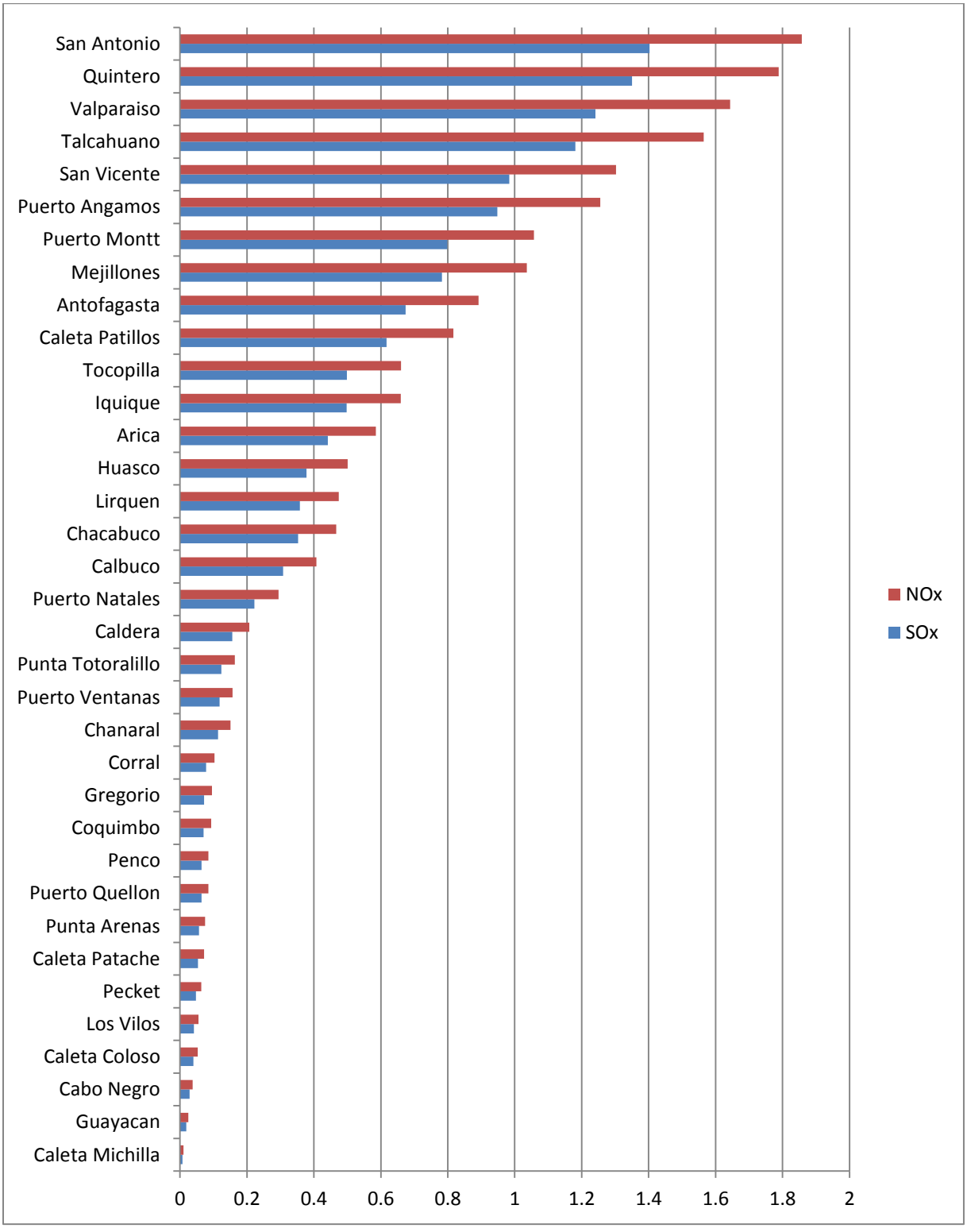
Figure 1.10. **Local air pollutants from ships in Chilean ports (by ship type)**



Source: ITF/OECD based on data from Lloyds Intelligence Unit.

Our own analysis shows that local air pollution from ships in Chilean ports amount to 20 800 tonnes of NO_x emissions, 15 700 tonnes of SO_x emissions and around 2 000 tonnes of particulate matter. This analysis follows the methodology as outlined and applied in Merk (2014), using AIS data for 2015. Containerships produce 40% of these emissions; slightly more than a quarter comes from tankers and around a fifth from bulk carriers. Containerships are relatively more polluting: they represent a third of the port calls and 12% of time in port, yet represent 40% of the air pollution. Bulk carriers are relatively less polluting (Figure 1.10). The ports in Chile with the largest shipping emissions are San Antonio, Quintero and Valparaiso (Figure 1.11); shipping emissions in ports are generally related to the intensity of port activity, in particular of containerships.

Figure 1.11. **Local air pollutants from ships in Chilean ports (per port)**

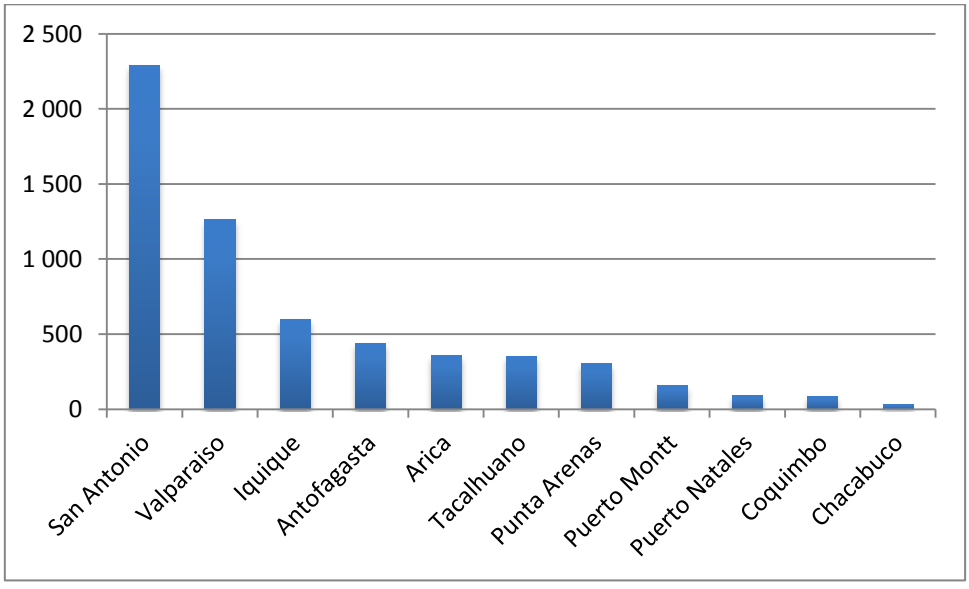


Source: ITF/OECD based on data from Lloyds Intelligence Unit.

In 2014, the *Comisión de Evaluación de la Region de Valparaiso* released a resolution (n°293) about the environmental impact of the dredging project in the port of San Antonio. The resolution estimated air emissions, liquid and solid emissions, as well as noise impacts. Regarding noise, limits are established by Ministry of Environment (DS n°38, 2011). The resolution lists the main sources of noise and their volume in Noise Power Spectrum (NPS). Levels of noise predicted were deemed conform to levels authorised by DS 38.

More information is available on traffic congestion in port-cities related to trucks to and from the port. The 2013 National Plan for Port Development contains figures on the number of truck movements per day in the city that are related to the port. These amounted to up to 2 288 truck movements per day in San Antonio, with lower numbers for the smaller ports in Chile. These truck movements directly affect urban traffic as ports are located in cities, in close proximity to the city centres (Figure 1.12).

Figure 1.12. **Port-related truck movements per day in Chilean port-cities**



Source: ITF/OECD elaborations based on PNDP (2013).

In some Chilean port-cities the main port traffic impacts are from cargo trains. This is for example the case in Antofagasta, where the cargo train between the port of Antofagasta and the mines regularly crosses main roads in the city. According to Merk (2013), this represents a total of 200 wagons a day in and out of the port of Antofagasta: trains of approximately 25 wagons in length, crossing the city 11 times on average within a 24-hour period, with at least four crossings over main roads within the city of Antofagasta.

Notes

1 It found that sectors which would benefit the most were other transport modes, communications and shops, restaurants and hotels, followed by public administrations and financing services (Jadresic and Villena, 2014). The TCVAL project is supposed to imply an increase of USD 43 million of the municipal yearly GDP, and USD 101 million in the regional GDP It would also generate 1 000 direct jobs and 3 000 indirect jobs, half of which in the city of Valparaiso.

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Chapter 2. Ports policy: In search of coherence

Chile has no explicit strategic ports policy. That means that the government does not have an explicit vision for the role of ports for Chile, their main challenges, opportunities and principal avenues for reform. Plans and initiatives tend to be fragmented among various public actors, while there is no overall global vision of the port system, as a part of a larger supply chain. The government is aware of this and aims to build a comprehensive strategy with a long term perspective. This is visible through the multiplicity of commissions installed by different governments over the last years, with the explicit mission to develop a strategic port vision. This is crucial in a country where the economy is highly dependent on maritime trade. Sufficient capacity is one of the main government concerns for the future, and maximising the potential of ports for the Chilean economy underlines the importance for the government to increase co-ordination between the actors in the transport chain.

While there is no explicit vision yet, several policy orientations exist with regards to maritime transport, ports and hinterland transport, which could be considered the implicit port strategy of Chile. The core project of the government is to increase capacities through the creation of a Mega-Port (*Puerto de Gran Escala*, PGE*)* in the central region of Chile. Key reforms over the last decades have introduced competition between and within ports, more private operations and investments, and a gradual opening up of the ports labour sector. The government aims to improve territorial planning to develop a co-ordinated and efficient logistic system at the national scale. Moreover, the government would like to develop more harmonious port-city relations, faced with a population increasingly aware of the negative externalities of ports, such as pollution, noise and congestion.

This chapter describes the ports policy of Chile: its strategic orientations, legal frameworks and instruments. It looks at the general policy framework, but also analyses in more detail the policies that affect the key determinants for port performance and positive port impacts, identified in Chapter 1. Policies for increasing port performance will need to provide for smooth maritime access, efficient port operations and effective hinterland connectivity. Policies to maximise positive impacts would increase the economic benefits from ports, whilst mitigating environmental impacts and reducing port-related congestion, hence improving port-city relations.

General policy framework

Main government documents on ports policy include the Government Programme 2014-2018, the 2013 National Transport Policy and the 2013 National Plan for Port Development (PNDP) of the previous government. PNDP was the first attempt to design a comprehensive policy for ports development at the horizon 2030. The plan built upon work done by the 2008 Consultative Commission (*Comisión Asesora en Materias Marítimas Portuarias*, CAMMP) that provided recommendations for formulating strategic port policy in Chile. Following this Commission, the Port-Sea Programme (*Programa Maritimo Portuario*) was created in 2009 within the sub-secretary of Transport, as the first attempt to plan the public port system over the long term. In 2010, this programme changed names to become the Logistic Development Programme because it included other modes of transport, and aimed at designing and planning for all freight transport mode. It was the first attempt to plan freight transport as a whole logistics chain – through the improvement of rail infrastructure, identification of new road needs, formalisation of the trucking industry, and support to

port concessions. In 2013, the Logistic Development Programme became a Division, and released the PNDP.[1]

The PNDP describes itself as "a continuous and participative planning process, aiming to incorporate progressively the distinct components of port development, as well as the views and proposals of the various actors of the national port system"[2] (PNDP, 2013). So it can be considered more of a first step of a planning process than a document giving concrete goals and deadlines. This might explain why in 2014 the government created a new commission to reflect on the port system planning (the Strategic Commission for Ports and Logistics) that formulated policy recommendations looking to 2030, released in 2016, on which the government has not yet reacted. At the port level, public policies are expressed in the Master Plans, Investment Calendars (*Calendario Referencial de Inversiones*, CRI) and Yearly Management Plans (*Planes de Gestion Annual*) of the ten public port authorities. These documents share some key orientations in line with the national policy objectives: the need to extend port capacity, create a holistic logistics system, and improve port-city relations.

The first orientation evoked in the Government Programme is the need to extend port capacity in the next 15 years. Indeed, the government is concerned with providing sufficient port capacity in line with projected demand for Chilean ports. Avoiding congestion is crucial for Chile considering the strategic importance of ports for the national economy. This concern is the main driver of the Mega-Port project, aiming to adapt the Chilean port system to growing traffic and the growing size of ships (Government Programme 2014-2018). This Mega-Port will increase the port capacity of the Valparaiso region in a 15 year horizon. The project will be conducted through a mix of public and private investments, and via concessions for future container terminals. This co-existence of a strongly centralised State and liberal policies with strong involvement of the private sector is a recurrent formula of policy-making in Chile (Zrari, 2011), especially in the field of transportation: e.g. the State launched a vast concessions program in the 1990s to fill the infrastructure gap in Chile, thereby creating a task division in which the State and the private sector partner, act as administrator and operator respectively. The Mega-Port project follows this scheme in which the central government has a leading role, while investments come from the private sector.

Second, the development of a logistics network is a key ambition in the different strategic document of the last years. As soon as 2010, the stated vision of the Logistics Development Program was to create a world-class logistics system, and this idea is at the heart of the PNDP 2013. This plan defines port activity not only as the site of cargo transfer but also a "part of the chain of processes happening from the origin to the destination of the cargo" (PNDP, 2013). This makes ports one element in a wider chain, serving as a gate to and from the hinterland. Accordingly, the Government Programme aims to secure coastal space for further port expansion, and reinforces territorial planning to strengthen the current transport network: "Progress is needed on the modernisation of freight transport. It involves promoting a consolidation of a sector characterised by atomisation, high informality and low capacity utilisation. It would be beneficial to move to a model of logistics companies that offer integrated services" (Government Programme, 2014-2018). At the level of Port Authorities, the creation of logistics zones appears in Master Plans and Investment Calendars. A number of port authorities have developed dry ports (Valparaiso, San Antonio) or are planning to do so (Antofagasta, Punta Arenas and Arica).

Third, improving port-city relations appeared as a fairly new orientation. In 1997, the Port Reform Law created the obligation to establish Port City Committees, thereby showing the desire of the central government to stimulate more harmonious relations between port and city. The ten public ports are located in close proximity of cities of more than 40 000 inhabitants, and urbanites are increasingly aware of the negative externalities from the ports – noise, pollution, congestion. Despite these orientations, green port policies are mostly absent in the main port policy orientations, although

the need to improve the quality of fuels and reduce emissions are briefly mentioned in the PNDP. Finally, recurrent labour conflicts were identified by the 2030 Strategic Commission as one of the elements affecting port performances. The strike of January 2014 triggered the reform of the law n° 20 773 (*Ley Corta Portuaria*), enacted in September 2014.

These policy orientations build on reforms over the last decades that introduced more competition in and between ports, and stimulated private operations and investments. Most of this was achieved via the 1997 Port Reform Law, but is the outcome of a longer history of port reform since the 1970s. In 1960, the government created the Empresa Portuaria de Chile (Emporchi, DFL 290), a central organisation in charge of ten state ports: Arica, Iquique, Antofagasta, Coquimbo, Valparaiso, San Antonio, Talcahuano, Valvidia, Puerto Montt and Punta Arenas. Port services in Chile were thereby provided by the State, through a system dividing the tasks of cargo handling between two sectors; transfer and carriage were provided by Emporchi, while loading and unloading services were in the hands of dockers' trade-unions. In this system, Emporchi was per definition a public monopoly. In parallel, there were heavy restrictions on the number of stevedores, as each of them had to get a license to work. This made the provision of these services another monopoly.

In the end of the 1970s, the port sector was in crisis. The system was not adapted to the increasing demand, as the liberalisation of the Chilean economy, in the context of the military dictatorship, provoked a surge of the maritime trade. To adapt to this situation, the State enacted a number of laws. First, the law n°18 042 in 1981 put an end to the monopoly of Emporchi within port areas. The law n°18 032 abolished the licence system for dockers. In return, the State provided 2 700 stevedores with a financial compensation for the loss of their privilege. Consequently, the system became multi-operator, with several private operators working within state ports. In 1990, with the law n°18 966, the State made the private sector responsible for port services, while Emporchi played the role of administrator. The property and development of ports were thereby divided between the public company (owner) and various private operators. The law n°19 542 incorporated the private sector in the provision of infrastructure through the mandatory launch of tenders, and stimulated the planning of the port territorial development through master plans and investment calendars. It regulated services and tariffs, which must be published.

Chile has a dual port system, with different frameworks for public and private ports (Table 1.1). The law n°19 542 only applies to the ten public ports, while private ports are regulated via the decree with force of law DFL 340 on maritime concessions. According to this decree, the Ministry of Defence is responsible for the control and regulation of the coast and of the maritime territory (art. 1), and has the "exclusive ability" to grant concessions on this territory (art. 2 and Decree 2 dating back to 2006). The granting of such concessions allows private groups to develop economic activities on the coastline, which is in line with the historical practice of development in Chile, in which state land may be granted for use by private economic activities. In order to establish a new private port, private groups need to ask for a maritime concession to the Maritime Authorities. The Maritime Authorities conduct a feasibility study, and if it decides to grant the concession, the investor will have to conduct an environmental impact study as well. In the cases of Arica, Iquique and Antofagasta, the Ministry of International Relations had to award a license to operate internationally in order to comply with the 1904 Treaty with Bolivia. For the other ports, the Customs Office provides clearance and defines the port zone. The maximum maritime concession length is 50 years and it is renewable, with the first concessionaire having priority on it. Public Port Authorities regulated by the law n°19 542 can grant concessions to private operators in public ports following the Port Reform Law (art. 7). This has to be made through the launch of a public tender, while the granting of a maritime concession only requires a solicitation.

Table 2.1. **Summary of the regulatory differences between private and public ports**

	Public ports	Private ports
Legal framework	Law n°19 542	Decree with force of law (DFL) 340
Owner of the land	State	State
Control of the maritime territory	Maritime Authorities (Navy)	Maritime Authorities (Navy)
Operator	Private terminal operators	Private operator
Pilotage services	Maritime Authorities (Navy)	Maritime Authorities (Navy)
Maximum length of the concession	Maximum 30 years	Maximum 50 years, renewable
Whom do they pay the concession?	Public port authorities	Treasury
Renewal of the concession	Re-bidding	Renewal without re-bidding
Concession payments	Result of bidding process	Minimum of 16% of the fiscal value. The fiscal value is indexed on inflation and can be updated at the end of the concession only. The rate is fixed.
Taxes	24% of corporate tax. 40% of tax on public companies. Half of remaining net port revenues is retrieved by the State. Tax on the land.	24% of corporate tax. Tax on the land.
Port fees	Base tariffs are regulated and published. Need to follow principle of non-discrimination.	Not regulated. Fees can be published but this is not mandatory. They do not have to be non-discriminatory.
Investments	Port authorities cannot invest in new super-structure, as this is the prerogative of private terminal operators. Port authority needs approval from Ministry of Finance. Depreciated value of private investment is reimbursed by the State at the end of the concession.	No regulation. Provisions could be included in maritime concessions.
Cities	Port City Committees for discussion between port and city.	No obligation to communicate with the city.
Planning	Obligation to publish a master plan.	No obligation to publish a master plan.

Source: Own ITF/OECD elaboration.

Differences between private and public ports relate to regulations of tariffs and services, and taxation. For both public and private ports, the maritime territory remains under control of the Maritime Authorities, with a clause that gives priority for military use in case of crisis. Public Port Authorities are independent and are overseen by the Public Companies Organisation, called SEP (*Sistema de Empresas Publicas)*, part of the Ministry of the Economy. SEP approves the strategic financial plan of each port authority. The annual budget of public port authorities is approved by the Budget Directorate (*Dirección de Presupuestos*, DIPRES) of the Ministry of Finance. Port authorities pay taxes: a corporate tax of 24% on net revenues and an additional tax on public companies of 40% of net revenues. Of the net revenues that remain after these taxes, the State generally retrieves, in the form of dividends, half or more of the remaining net revenues. The law allows the State to retrieve 100% of the remaining net revenues and sometimes the State collects "future earnings" thus affecting the port authorities' capital base. This practice makes public ports dependent on the State for their investment needs.

Private ports have to pay the same corporate tax, but not the 40% on public companies. Both the private ports and the public port authorities are faced with a tax for the land under concession or assigned to the public port authorities. Private ports can be of private use or public use, and are classified as such in government documents. In practice, however, this distinction is somewhat artificial because – as explained in Chapter 1 - private ports have no public services obligation, so private ports "of public use" could refuse a client. Similarly, private ports of private use could accept clients other than their mother company.

Table 2.2. **Main legislation related to ports**

Name	Year	Main themes
Merchant Marine Development Law	1979 Revision: 2006	– sets out the division of the role between the MTT (commercial aspects) and the MOD (technical aspects) (art. 1) – affirms the monopoly on cabotage (art. 3) and the reciprocity principle (art. 4) – sets out the exemption of VA tax for shipyards companies and other fiscal benefits (Title III, articles 7 to 15)
Navigation Law	1978, Revision: 2005	– regulates the role of the Maritime Authorities (DIRECTEMAR) (art. 5) – sets out conditions to register a vessel under the Chilean flag (art. 11)
Port Reform Law	1997 Revision: 2011	– creates ten port authorities (art. 1) – regulates port concessions for public ports (art. 7) – creates Port City Committees (art. 50d)
DFL on maritime concessions	1960	– regulates maritime concessions for private ports
Ports Labour Reform Law **(Ley Corta Portuaria)**	2014	– grants the retroactive payment of lunch breaks since 2005 – grants a break of thirty minutes every four hours

Source: Own ITF/OECD elaboration.

Public budget as policy instrument

Public budgets dedicated to ports could also be considered the expression of a government port policy. At the national level, budget for ports come from the Budget Directorate of the Ministry of

Finance. There are investment plans for infrastructure to connect sea and land transport, mainly in remote zones (for example, construction of passengers terminals), the maintenance of port and coastal infrastructure, coastal improvements and shore protection. Other port-related investments of the central government are in hinterland transport.

Maritime passenger transport in the island zones of the south is financed by the central public budget, as a public service obligation, and a way to reduce inequalities for remote communities. Indeed, island zones of the south can only be linked to the rest of the country via maritime transport. The Law of Public Transport Subsidies (law n°20 378, 2009) established national subsidies for public transport by the Ministry of Transport and Telecommunications and the Regional Support Fund of the Ministry of Finance. This law allowed improvements in maritime services in remote islands regions, such as the archipelago Juan Fernandez, the north of the Aysen Region, the Palena Province and the Los Rios Region.[3]

However, most of the public investment on ports and port-related activities is covered by the ten port authorities themselves, after approval of the budget by the budget directorate – the government has not invested directly in ports for many years. Accordingly, under the Port Reform Law (art. 8 and 13), each port authority has to release a Referential Calendar of Investments (*Calendarios Referenciales de Inversiones*, CRI) regulated by the DTO 102 (1998). These calendars present the investment projects in accordance with the master plan with a five-year horizon. These plans are referential in the sense that they do not automatically qualify for funding approval by the budgetary authority. Main investments items in 2015 included the development of logistic zones (Antofagasta, Austral, San Antonio), capacity extensions (Valparaiso, San Antonio) and extension of parking areas for trucks (Austral, Arica).

The Ministry of Transport and Telecommunications is responsible for (law n°19 542, art. 50):

- Proposing joint actions between public and private actors to promote the efficiency, capacity and competitiveness of the national port system, and its commercial development.
- Proposing strategic plans for the public port system in order to improve its competitiveness.
- Promoting and support the introduction of new technologies for the exploitation of ports.
- Ensuring a harmonious relationship between ports and cities, in terms of urban space, access roads and environment. For this purpose, the Port-City Committees are created as a co-ordination body within which must participate (at least): a representative of the regional government and a representative of each municipality related to the port.
- promoting and maintaining a statistical information system in relation to port activities, available for public and private actors.

Policies to improve port performances

Port performance can be improved at the three levels evoked in Chapter 1: the maritime, port and hinterland (OECD, 2014). That is to say that well-performing ports have strong maritime connectivity, effective port operations – sustained by high quality inputs and organisation – and good hinterland connections. This section describes the Chilean policies to improve port performance along these lines.

Table 2.3. **Main public actors and instruments**

Actor	Planning	Regulating	Financing
Ministry of Transport and Telecommunications	National ports and logistics strategy	Public ports (law n°19 542) Public Railways (EFE)	Public railways (EFE) Subsidies for cabotage services for southern connectivity
Ministry of Defence	Coastal planning Administration of the coastline	Private ports Port services	Coastal defence
Ministry of Public Works	Works of connectivity, touristic and fishing coastal uses	Road concessions	Public roads
Ministry of Finance			Regional shipping in southern Chile
Agency for State-Owned Enterprises (SEP)	Approving Strategic Financial Plans of the port authorities	Management control of public ports	Approving budgets public ports
Port authorities	Port master plan	Administration of public ports	Public port infrastructure
Regional governments	Regional coastal planning (Regional Commission of coastal uses)		
Cities	Urban plans	Re-zoning Truck bans	

Source: Own ITF/OECD elaboration.

Maritime access: An implicit hub policy

Chile has a relatively large number of medium-sized ports, as was indicated in Chapter 1. This is the result not so much of an intended policy, but rather Chile's geography with its long coastline and the proliferation of private ports. Unlike other countries, Chile does not have an explicit port hierarchy that indicates the ports of national or regional importance and that could serve as a basis for priorities for investment. There is no requirement of having a public port in every region; e.g. the third region has no public port.

Chile has an implicit ports hierarchy. A strict maritime cabotage policy – discussed below – has in practice meant that global containerised trade is fairly concentrated in the two largest ports in the central region: San Antonio and Valparaiso. The central government is also strongly involved in the development of the Mega-Port PGE in central Chile that would accommodate additional container traffic particularly from larger container vessels. Such a concentration of port capacity in one or two ports increases the maritime connectivity. Considering Chile's geography – peripheral to main

maritime trade lanes – transhipment (or a transhipment policy) is not a realistic option, unless the bi-oceanic corridor – linking Atlantic and Pacific Ocean – becomes a reality. The Ports Law stipulates that dredging is a responsibility of port authorities, so if ports other than the two ports in the central region would also like to attract large container vessels, they have the tools to realise this ambition, subject to approval by the SEP (with regards to the plans) and the Budget Directorate (with regards to financing).

The access of ships to ports is subject to fairly detailed regulations. First, the Maritime Authorities can decide to close a port for bad weather or safety reasons. For example the port of San Antonio was closed 38 days in 2015 for visibility issues, and the port of Arica 30 days. Port security, including signalling, is also a responsibility of the Maritime Authorities, subject to a fee to be paid by ships calling the port. Second, in accordance with the Navigation Act from the Ministry of Defence, all piloting services for navigating interior waters are provided by the Maritime Authorities, both in public and private ports. There are two forms of pilotage: manoeuvring the ship in a port, and steering the ship through canals (e.g. the Magellan Straits) or between ports. There are officers in every bay; their number is defined according to the number of terminals in the region. For example, there are 14 pilots stationed in the Concepcion Bay, which cover the ports of San Vicente-Talcahuano, Lirquen, Coronel, and other private ports of the bay. Pilots have to be licensed, and each pilot must be qualified to manoeuver in any of the region's ports. The minimum notification for pilotage services is two hours, but normally pilots are notified one to two days in advance. Pilotage tariffs are regulated by the Maritime Authorities and depend on the tonnage of ships. In addition, Article 309 of DS 427 fixes the fees for pilotage (*Practico Autorizado).* Pilots' revenues go to the Maritime Authorities. Pilots do not own boats; those are owned by shipping agencies.

Towage services are handled by a few private companies, such as Ultratug (part of the Ultramar group), SAAM, and CPT. Towing can only be provided by boats that fly under the Chilean flag (law n°2 222, art. 41), and no towage services can be provided without authorization of the Maritime Authorities, except in cases of emergency. The guidelines to determine how many tugboats are needed are published. The Maritime Authorities can authorize foreign tugboats to participate in towing if necessary. They can order the obligatory use of towage services when deemed necessary for safety reasons (art. 40).

Port operations

Effective port operations require high quality inputs (capital, labour, land) and high quality institutional arrangements, such as competition, planning and cooperation (OECD, 2014). Port operations have been liberalised since the 1980s, as the export-oriented economy of Chile required supporting the competitiveness of ports. On the one hand, policies have been implemented to improve the quality of inputs, namely capital, labour and space. The upgrading of infrastructure and equipment was stimulated by the implementation of a Landlord Port Model in 1997, leaving more space to private investments. Labour is still largely dominated by the power of trade unions, and characterised by low social standards for port workers, although reforms are progressively changing this. Finally, the government is developing strategies to ensure land availability for port expansion. On the other hand, policies have attempted to improve the quality of organisation. Port planning was made mandatory through the master plan, and rules to ensure competition between terminals have been created. However, there are neither institutionalised spaces of coordination for port authorities, nor planning at the port system level.

Quality of inputs: Capital, labour, land

Ports policy reforms since 1997 have stressed the importance of private investments in ports. In the 1990s, port infrastructure investments were lacking, because the state firm Emporchi did not attract foreign investors (OECD, 2011). The 1997 port reform intended to stimulate private investments by dissolving the state monopoly of Emporchi, instead creating a landlord model, with port authorities in the role of administrators of the ports, while private concessionaries operate port terminals. In this model, port authorities have the status of state-owned companies. Through the Port Reform Law private investment was encouraged over public investment: it is mandatory to go through a bidding process to invest in public ports, and port authorities themselves are only authorised to invest when the bidding process fails to attract private parties. Since 2000, port concessions in Talcahuano-San Vicente, Valparaiso and San Antonio started to operate, followed by Antofagasta, Iquique, Arica and Coquimbo.

In parallel, the port labour system remains rather closed and with poor social standards despite recent reforms. As previously mentioned, before the 1981 reform, on-board stevedores were recruited among trade-union members only, and their number was limited by licenses. Shore workers were hired by the state enterprise Emporchi. The 1981 reform put an end to the license system for stowage (law n°18 042), thereby opening entry into the port labour force to any worker. This period without licenses lasted only four years, following massive strikes in Valparaiso. The trend of port liberalisation work went further with the Port Reform Law of 1997, which resulted in a massive diminution of port workers due to the end of Emporchi's monopoly. However, the current port labour system is still dominated by the power of trade unions and port labour standards are low compared to other countries. This is visible through the 2014 *Ley Corta*, which granted very basic rights, such as a lunch break.

Most workers are temporary (about 80%) in order to adapt to the fluctuating demand. It means they can choose when they work and are paid per day. Temporary workers end up being better paid than permanent workers, however, they have no insurance in case of accidents, no pension, and there is no limit on the number of hours per day they can work. It is estimated that there are 30 000 licensed workers, and 15 000 active workers. Temporary workers are assigned by trade unions, while private operators hire permanent workers. Consequently, trade unions still have a strong influence on temporary workers and the unionisation rate is close to 90%. This might explain the high frequency of blockages in Chilean ports. A specificity of Chile is the high fragmentation of trade unions; for example, the port of Mejillones has about 600 workers and seven unions. Although every port has its own unions, collectively they have a strong capacity to co-ordinate for strikes. They are gathered in big "unions of unions", *Union Portuaria de Chile* (UPCH), la *Confederación de Trabajadores Portuario* de Chile (Cotraprochi), and the temporary worker union.

There are no formal social dialogue structures, which results in a state of permanent negotiations between port authorities and trade unions, according to some observers. There is a representative of workers in the board of each port authority. Its role is limited, however, because it represents people working for the port authority, though not the majority of the operational port workers, who work in the terminals. The current Labour Code dates back to 1979 and it leaves very little space for collective negotiations at the sectoral level, as it establishes negotiations at the company level. Recently, new negotiations had to take place following port strikes in January 2014. From these negotiations emerged the *Ley Corta Portuaria* (law n°20 773), enacted in September 2014. This law granted workers a break of thirty minutes after four hours of work, and obliges the port authorities to plan rest areas for workers (art. 1). It also triggered the retroactive payment of unpaid lunch breaks back to 2005. For now, as regards health and accidents, workers are dependent on social insurance institutions (*mutuales)*, which are criticised for not doing proper enquiries on accidents. Neither port authorities

nor unions have data on the number of accidents. Investments in training are at the company's discretion, there are no national of sectoral standards. The current system of pension is mostly based on voluntary savings. Labour conditions are different in private ports because they have their own workers; hence they are less dependent on trade unions and less affected by strikes. Various public ports, including San Antonio and Valparaiso, have managed to become less dependent on temporary workers by hiring more permanent workers.

The third input is land. Chilean ports have constraints in this regard, because they are located in close proximity to city centres. Consequently, land availability and the improvement of planning is one of the main preoccupations of the government, especially for the central region. The Government Program 2014-2018 sets out the creation of a plan securing coastal areas for upcoming port expansion, given that most coastal space belongs to the State. Currently, the use of coastal space is regulated by Supreme Decree 475 (1994) on the Use of the Coastal Fringe (*Politica Nacional de Uso de Borde Costero, PNUB*). This decree created the National Commission on Littoral Use (CNUBC), as a formal instance of co-ordination between relevant stakeholders. It is presided by the Ministry of Defence and gathers public and private actors, including the Ministry of Transport and Telecommunications, to advise the government on the use of coastal space, in order to develop a national policy for coastal planning. Moreover, in 1997, Regional Commissions of coastal space (*Comisiones Regionales de Borde Costero*) were created to propose an adequate zoning of the coast based on its various uses – preferred uses are determined among ports, shipyards, industrial infrastructure, recreation, and fishery. The competency for zoning was granted to regions, but regions do not establish their own budgets, do not have tax authority, and their representative (*Intendente*) is not elected but appointed.

The development of zoning started mainly in 2007-2008, when pilot plans were designed in two regions. Technical offices are in the process of making similar sectoral plans in other regions. In addition, as mentioned previously, Chile has the particular characteristic of dual allocation of coastal space, following the dual system of port and maritime concessions.. For now, there are nine port concessions and about a hundred maritime concessions for ports. The Maritime Authorities website indicates more than 5 500 maritime concessions in total yet not all of them are ports; they can also be for other coastline uses such as, nautical activities and restaurants. Among the concessions, 2 400 are active and the rest are pending.

Quality of organisation

The 1997 Port Law introduced competition between ports and terminals within ports, in order to reduce the costs of port operations and improve productivity. The Port Law also states that the provision of port services must respect the principles of free competition (art. 21) and non-discrimination between users (art. 31). This rule only applies to public ports, while fees of private ports are not regulated. Similarly, tariffs of public ports have to be published, while it is not an obligation for private ports. Recently, the MTT started auditing concession contracts to check if tariffs were non-discriminatory. In addition, some activities, such as loading and unloading cargo, can only be conducted by the private sector (art. 5).

The Port Law also sets out the supervision of the Competition Authority over the granting of concession: the authority has to review the conditions of such tenders. Moreover, the Competition Authority oversees horizontal and vertical integration. If a consortium owns more than 15% of the corporate concessionaire of a port terminal, the group or its branches are not allowed to own directly or indirectly more than 15% of another corporate concessionaire of a terminal in a public port of the same region. Business groups owning more than 15% of the shares of private ports are not allowed to own directly or indirectly more than 15% of a corporate concessionaire of a terminal in a public port

of the same region. If these conditions are not respected, port authorities have the power to end a concession.

On vertical integration, the Competition Authority established that "the most relevant users"[4] cannot own more than 40% of voting rights or economic shares or both in the corresponding corporate concessionaire. To ensure the respect of these dispositions, concessionaires should report to the port authorities every three months about their stockholder interlinks. However, exceptions can be made as the Competition Authorities can decide the conditions the best adapted to each port, e.g. in 2006 the concessionaire of the port of San Antonio requested a revision of the 40% limits on vertical integration to the Competition Authority, which allowed an extension to 60%.

The legal framework for ports has provisions on port planning. The Port Reform Law imposed the publication of a Port Master Plan (art. 8 and 13) presenting the current state of the port (existing infrastructures, concessions, access roads for example) and the main orientations for the coming five years (horizon 2018 for the 2013 plans) and 20 years (horizon 2033 for the 2013 plans). Similarly, the directors of each port authority have to publish a management plan every year (*Plan de Gestion Anual*) setting the goals that are to be evaluated by the SEP.

Some ports are open the whole week, day and night, dependent on their level of activities. Customs are also able to work 24 hours a day, but other logistics services (warehouses for example) do not work 24h, which limits the practicality of working 24 hours a day. If a new private port is created through a maritime concession, a (public) custom station has to be established in this port, even though Customs was not involved in granting the maritime concession. There is no stationary custom staff in every port; for example, there are three sites with customs in the second region and staff have to drive from one of them, like Antofagasta, to a private port with no permanent custom staff. Nowadays, regulation does not allow custom operations in dry ports.

It has become common practice for at least a few ports in Chile to co-ordinate with other stakeholders that form part of their port community. An example is the port community system SILOGPORT that was put in place in 2008 by the Port Authority of Valparaiso. It consists of a port information system to facilitate data sharing among port community actors (*Comunidad Portuaria*). The *Comunidad Portuaria* of Valparaiso is composed of the external trade system of the Ministry of Finance SICEX, the Maritime Authorities, the concessionaire TPS, the agricultural inspectorate (SAG), customs, health inspectorate, the fisheries inspectorate (Sernapesca), and the logistics and distribution company Sitrans.

Finally, there is no obligation for port authorities to co-operate with other ports. Since the 1997 reform, Chilean ports are more characterised by inter port competition than co-ordination. An example of this is the lack of one port community system used by all ports; instead various ports have developed their own systems independently from each other. However, the Ministry of Finance is currently working on developing the SICEX system, an integrated system for trade, also called "single window". The goal of SICEX is to integrate different agencies, such as the agricultural inspection, customs and health inspectorates, to allow better sharing of information, and develop standards for public services. The system, which would include both public and private ports, is currently not mandatory.

Hinterland connectivity

There is no national policy on the hinterlands of ports, hence no real attempt to develop a logistics network. As mentioned before, initiatives exist at the port authorities level to create dry ports, freight corridors and port-information systems, but these are often difficult to realise considering that

the mandates of port authorities is restricted to the port area; although in line with the orientations given in the Government Plan and the PNDP, the concrete implementation of projects is delegated to port authorities. As can be seen from the port authorities' investment plans, several ports have moved or intend to move logistic activities to dry ports. In Valparaiso for example, where port activities are constrained by the lack of space – the port is surrounded by the city and hills – the logistic site ZEAL was created 11.6 km away of the port (Box 3.3). However, there is no plan to generalise this kind of initiative at the national level.

Port authorities have the right to acquire land for dry ports. In Antofagasta, the land for the dry port of Portezuelo, located 33 km away of the city has been obtained through a free concession granted to the port authority of Antofagasta for 50 years by the Ministry of National Assets, mainly to handle Bolivian cargo, as part of the post Pacific War agreement allowing Bolivia to use Chilean port facilities. The right for port authorities to obtain free concessions is established in DL 1939, 1977, (art 61).[5] Port authorities can also buy land, which needs to be formalised with a decree that indicates the new boundaries of the port area when the acquired land is adjacent to the previous port area, but not when it is remote such as in the case of the ZEAL. For example, the Port Authority of Valparaiso (EPV) bought two properties in 2003, one from Segetrans Transporte S.A in the sector Baron, and another from the municipality of Valparaiso in the sector of Yolanda (decreto 100, 2004). Similarly, in 2005, EPV acquired four plots of land from the Metro Regional de Valparaiso for the project Puerto Baron, in the context of *Plan de Apertura y Transformacion del Borde Costero de Valparaiso* (decreto 93, 2006). Finally, in 2006, EPV purchased five plots from EFE for the same project (decreto 33, 2008). In 2005, the Port Authority of San Antonio bought 90 hectares from the Ministry of National Assets. In addition, there is a project to build a logistics facility in the outskirt of Santiago.

Freight connectivity by rail

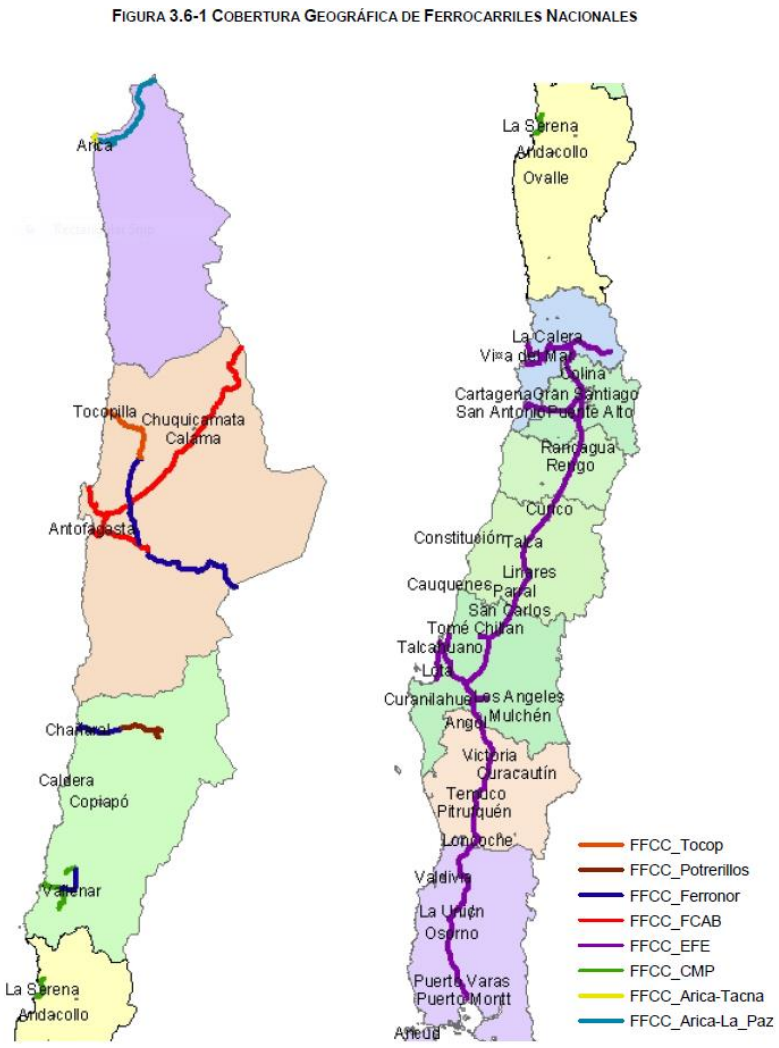
Two laws regulate the rail system: the *Ley General de Ferrocariles* (1931), and the *Ley Organica de la Empresa de los Ferrocariles del Estado* (1993). In practice, private railways for public use are regulated by the first one and EFE by the second one, although its application is very limited (MTT, 2007). The *Ley General* encourages concessions by providing certain advantages, such as the reimbursement of certain customs duties, and tax exemptions during the first ten years of the concession. Railway companies operating on public tracks must share infrastructure with other companies (art. 51), and directly negotiate the conditions for use and tariffs with EFE, there are no standardised rules. This *Ley General* is deemed obsolete because it has not changed since 1931, and does not include concerns such as technical norms, security and the environment (MTT, 2007).

The *Ley Organica de la Empresa de Los Ferrocariles del Estado* (1993) and its modification in DFL 24 (2003), defines EFE's object as the exploitation of services of freight and passengers transport, which can be done directly or via concessions. It is important since it allows the national railway company to partner with the private sector. Concessions have to allow the utilisation of infrastructure for other users, with non-discriminatory tariffs (art. 2). Following this law, EFE created the subsidiary FEPASA in 1993 (privatised in 2003) in charge of freight operations. In 2001, the private company TRANSAP also got a concession for freight transport. EFE can obtain financing (credits, subsidies, fiscal contributions, guaranties) from the State to finance infrastructure investment (art. 32).

The current position of the MTT is to foster investment in rail freight. For now, passengers' transportation has priority over rail freight. This is for example visible on the San Antonio-Santiago line. The ambition of increasing rail freight was first set out in the 2013 *Plan de Impulso a la carga ferroviaria (PICAF)*, and then integrated in EFE's Investment Plan 2014-2016. Currently, road is the main freight transportation mode, accounting for nearly 90% of total freight, while freight rail

represents less than 10%. The goal of the government is to double the volume of cargo moved by rail to reach 20-24 million tonnes per year by 2020 – it is about 11 million tonnes per year today. This represents an investment of USD 320-376 million (EFE, Plan Trienal, 2). The long-term ambition is for rail freight to have a modal share of 30%. This goal of modal shift will require a clear policy to prioritise freight over passengers on key lines, with significant investment from either an external private operator or from public funding. Until the publication of the PICAF, there was no strategic planning for rail freight as Soto (2013) argues; "there is no regulatory body in charge of railroad operations, and no agency responsible for the strategic, long-term planning for the industry" (Soto, 2013).

Figure 2.1. **National railway network**



Source: MTT (2009).

There is no general policy to connect railways to ports. However, the 2013 PICAF sets the objective of increasing the share of cargo transported by rail in public ports. Detailed projects are provided in the PNDP, which presents a section on railway access for each port, including an assessment of the current access and a presentation of future projects. It shows that although the general level of in-port rail cargo transport is low, there are important disparities among ports, with a

very low level in Valparaiso (about 2% of total cargo is transported by train) and a relatively high share in Antofagasta (30% of total cargo). There are several projects aiming to rehabilitate railways (Arica, Iquique). There are also projects aiming to improve the connections between railways and dry ports (Antofagasta-Portezuelo, Iquique-Alto Hospicio). Finally, railway projects in Valparaiso and San Antonio are conditional on the location of the Mega-Port project (PGE). The port of San Antonio has formulated the goal of reaching a rail cargo share of 30% in case the PGE would be located in San Antonio.

There may be an opportunity to develop a dedicated hinterland freight railway from the central ports to a small network of logistics centres distributed in the vicinity of Santiago (aiming to cater for imports) and a few hundred kilometres southwards (for exports). Road congestion and air pollution could be relieved by investment in such inland ports served by efficient rail links from the central ports and, from the perspective of freight movement competitiveness, cost-saving opportunities could arise from an increased railway modal share. Whilst rail service in Valparaiso has been compromised by the decision to cover over tracks, restricting loading gauge, and run suburban passenger trains on the line through the port, in San Antonio rail access to terminal could be expanded substantially if land adjacent to the port is protected from encroachment by new urban development and if priority were to be granted to cargo along the trunk line including with regards to prospected improved passenger services. Given the potential for increased trade, private investors might be attracted to invest in a dedicated freight railway if national rail and port hinterland policy were developed harmoniously and in order to provide for such stand-alone investment. Alternatively, the government might invest in enhanced rail freight infrastructure. The scale of investment required might make private investment the preferred option, which would most likely entail an overhaul of the regulatory framework in the country. In either case a clear separation of freight from passenger operations would be required.

The regulation of the trucking industry is characterised by a favourable tax and tolls policy. Participation in road cargo transportation only requires a driving license, hence the atomisation of the sector, with a high number of small companies or individual truckers. Truckers benefit from a tax credit on for a share of their diesel purchases [6] (law n°19 764, 2001): cargo transport companies owning or renting a truck of more than 3 860 kg may recoup a percentage of the tax on diesel under the form of a tax credit on the VAT (art. 2). This tax credit was originally amounting to 25% of the diesel tax paid as a tax credit against the VAT, it exceptionally went up to 80% between 2008 and 2009 following a strike (law n°20 278, 2008) and was in 2009 changed into a recovery rate between 38% and 80% depending on annual sales (Agostini and Martinez, 2014). Most high-speed divided highways in Chile are operated under concession remunerated through tolls with minimum revenue guaranteed by the State. The toll payments by trucks do not cover the wear and tear caused by the trucks on the roads, for which maintenance costs are incurred. So freight transport by truck is cross-subsidised by other road users (figures on this are provided in Chapter 3). However, it is in practice difficult to change this. In February 2016, the *Confederacion Nacional del Transporte de Carga de Chile* protested against the costs of the tolls of the roads 68 and 78, linking Santiago to Valparaiso and San Antonio, respectively.

Other regulations state that truck drivers have to pause for two hours after a five-hour drive, with standby time counted as driving time. However, this regulation applies to truck companies, while independent truckers who own their own vehicle do not have to follow this rule.

Coastal shipping

Coastal shipping is generally reserved for vessels sailing under the Chilean flag. Although the law stipulates exceptions, fiscal measures constitute further entry barriers to foreign ships. According to the 1979 Merchant Marine Law (art. 3), short-sea shipping can only be conducted by Chilean ships,

and conditions to carry the Chilean flag are defined in the navigation law.[7] Foreign ships can only participate in cabotage in three cases. First, for volumes exceeding 900 tonnes, foreign vessels can be authorised to operate in short-sea shipping after a public tender procedure. Second, a special authorisation (or waiver) might be granted by the MTT for cargo under 900 tonnes when no Chilean ship is available, if it is proven that no Chilean boats are available. Third, foreign vessels may be considered Chilean when they are chartered by Chilean companies, hence "reputed" Chilean. Cabotage ships are required to have the same conditions as international ships, mainly they have to use agencies and pilot services, except if the pilot is Chilean and habilitated.

However, in practice, these exceptions do not allow a significant participation of foreign ships in cabotage. In 2010, only 0.3% of the cargo transported by cabotage was moved by foreign vessels (Camport, 2015). Furthermore, within the exceptions provided by the law, there are additional barriers to foreign participation in cabotage. For example, foreign ships over 900 tonnes that win a public tender have to pay a penalty of 6% on the offered price as an equivalent of the customs tariff. Finally, the Law on Income Tax (DL 824, 1974, art. 59) stipulates that in case of the lease of a foreign vessel to participate in cabotage, there is an additional 20% tax on the total lease value (art. 59). Hence, foreign vessels are taxed more than Chilean ships when operating in cabotage, which further deters their participation; so international ships do not tend to participate in tenders. Very few domestic groups operate cabotage services: there are two groups in the south, and two in the north, where Ultramar handles 90% of the cabotage operations.

It seems that there are two reasons for maintaining the national monopoly on cabotage: security and employment. Cabotage is considered a way to maintain a national commercial naval fleet, for times of emergency. Currently, the market for cabotage is very concentrated, especially for large volumes. It is mostly liquid bulk, which is transported by short-sea shipping (representing about 62% of the national cabotage market), and 95% of the traffic is concentrated among the bigger suppliers. Concentration is much lower in the south of Chile, where there is very limited land access. The National Petroleum Company (ENAP) for example is an important user of cabotage as it moves 30% of its cargo through maritime transport, between its three refineries (Aconcagua, Bio Bio and Gregorio) and its four terminals in Quintero, San Vicente, Cabo Negro, and Gregorio (Magellan region).

Liberalising cabotage was mentioned in the program *Impulso Competitivo*[8] of the previous government in 2011 (Ministerio de Economía, Fomento y Turismo, 2011). In 2012, a proposal for legislation was presented to Parliament to open cabotage to foreign vessels of 2 000 dead weight tonnes and more. In addition, it proposed eliminating the capacity of the Maritime Authority to exclude foreign vessels from cabotage. The object of this proposal was to stimulate competition in the cabotage market in order to reduce tariffs, and create incentives to use coastal shipping instead of trucking, especially for containers. These only represent about 14% of the current cabotage traffic while solid and liquid bulk are about 86%, and would optimise the use of containers between ports. This proposal would also change the Law on income Tax to modify the 20% tax on chartered ships. However, the legislative proposal was not adopted.

Bi-oceanic corridors

In parallel with the Port Reform Law, one of Chile's external policy priorities was the development of bi-oceanic corridors in Latin America, that is, the connection of the Atlantic and Pacific oceans via a land corridor between main Argentinean and Chilean ports. In 1993, the Chilean and Brazilian Ministries of Public Works started to discuss the idea of bi-oceanic corridors. This bilateral debate was brought into the MERCOSUR, and led to the 1996 Economic Complementation Agreement between Chile and other MERCOSUR countries. Article 33 of this agreement specifies

that the MERCOSUR states and Chile are committed to the development of infrastructure to develop bi-oceanic corridors. In order to do so, they are required to "improve and diversify" land connections, and stimulate the development of infrastructure allowing increasing port capacities while guaranteeing their "free use". By virtue of this article, these states have to promote public and private investments toward these objectives.[9] Bi-oceanic corridors imply both physical infrastructure integration, and the integration of trade norms.

Policies to increase net positive impacts

There is no specific policy to maximise the economic benefits from ports. The OECD (2014) highlighted three potential ways to increase the economic spillovers from ports: waterfront development, maritime clusters, and industrial development. There are a few local projects to develop waterfronts in port areas for commercial activities. In Antofagasta, the Port Authorities granted a 30 year-long concession to construct a mall, inaugurated in 2008, in the context of the *Plan Puerto Nuevo*. Similarly, the Port Authority of Valparaiso granted a concession to Mall Plaza, a private company, to build a shopping mall on the Baron gate –Mall Puerto Baron. However, this project was criticised by citizens, the UNESCO – part of the historic centre of Valparaiso being a World Heritage Site – and the environmental authorities. Construction has not begun.

In 2011-2012, there was an embryo of reflection about implementing a maritime cluster in Chile, in the context of the Exponaval 2012. The initiative came mainly from the National Association of Shipowners (*Associacion Nacional de Armadores*, ANA), which designed an action plan to create a maritime cluster. However, it did not reach the agenda. The absence of the notion that shipping policy could be at the core of the establishment of a maritime cluster also becomes evident when focusing on the orientations of shipping policy in Chile.

Shipping policy as a component of a maritime cluster

The main characteristic of Chile's shipping policy since 1979 has been liberalisation. The Merchant Marine Development Law put an end to many protectionist measures, by ending cargo reservations as well as most subsidies and tax exemptions. This law was passed in 1979 to replace the 1956 law "For the Promotion of a Marine Merchant Fleet". The 1956 law aimed to promote the growth of the national merchant fleet (Bennathan, 1989). The Merchant Marine Development Law put an end to this protectionist system, firstly by eliminating cargo reservations for foreign trade, except with Brazil[10]. Cargo reservations were designed to protect national shipping, by reserving 50% of cargo tonnage for vessels operating under the national flag[11] (Odeke, 1984). The 1979 Law replaced cargo reservations by the reciprocity principle (DL 3059, 1979, art. 4). It means that "the percentage access to maritime cargoes, from or to the country, for foreign merchant vessels depends on the percentage access allowed, in the corresponding traffic, to Chilean vessels by the country in question (WTO, 2015). However, the reciprocity principle only applies to countries practicing cargo reservations.

In addition to ending cargo reservations, the 1979 law put an end to subsidies and tax exemptions. In 1956, shipping companies enjoyed tax reliefs, with 20% of their benefits not being taxed and the remainder only taxed at half the standard rates (Bennathan, 1989). However, the savings from the lower applicable rate of income tax and 20% tax relief were allocated to a special fund available for vessel acquisition or improvements (Bennathan, 1989; law n°12 041, 1956, art. 8). In addition, "capital gains on ship sales were similarly exempted from tax if allocated to the capital construction fund" (Bennathan, 1989). Today, Chilean and foreign shipping companies, including those of lightering, wharfage and towage, benefit of tax exemptions on VAT because they are considered exporters. They may recoup the VAT paid to import goods or use services, insofar as these operations are necessary

for their activities (DL 825, 1974, art36; DL3059, 1979, art7). If the shipping companies are unable to make use of this benefit, the shipyard and dockyard companies will be exempt from VAT on the sale of goods and the provision of services to said companies, provided they are not engaging in cabotage (WTO, 2015). Chile does not have a tonnage tax to stimulate the Chilean ship registry – which is relatively small – and does not seem to have a policy keeping maritime headquarter functions in Chile, e.g., during the acquisition of the Chilean container line CSAV by Hapag Lloyd.

Reducing environmental impacts of ports

The main regulatory framework for environmental impacts of ports is the *Ley de Bases del Medio Ambiente* (Ley 19 300, 1994). Port works and navigation are listed as activities impacting the environment (art. 10), consequently these activities must go through a System of Evaluation of Environmental Impact (SEIA). This law obliges any entity responsible for the degradation of the environment to repair its damages through financial compensation. In addition, the National Commission for the Environment (*Comision Nacional del Medio Ambiente, CONAMA*) released a guide in 2000 to prevent industrial contamination in port activities. Finally, regarding international regulation, Chile has signed the MARPOL Convention 73/78 for the Prevention of Pollution from Ships.

Apart from these provisions, Chile has no specific policy encouraging the greening of ports. Initiatives in favour of the environment differ between port authorities; they can also choose to sign Clean Production Agreements (*Acuerdos de Produccion Limpia*) to go beyond the minimum requirements, which has been done by various ports. Only the Port of Arica has been actively pursuing a green ports policy.

Private operators of public ports are required to provide environmental compensation in case port expansions cause environmental harm. The plans for the Puerto de Gran Escala (PGE) in San Antonio, for example, include the creation of a national park for migratory birds. Similarly in Mejillones, the private port established a bird protection area.

Mitigating the impacts of earthquakes

There is no policy directly aiming to reduce the impact of earthquakes, yet, the system set by the Port Reform Law incentivised concessionaries to invest in better anti-seismic infrastructure. The planned improvement to the quality of infrastructure is a criterion for port authorities when attributing a terminal to an operator. The DS 104 (1998) related to Article 7 of the Port Reform Law on concessions, indicates that technical qualifications should be taken into account by port authorities when granting a concession (art. 9, k).[12] In fact, projects of reinforcing infrastructure to prevent seismic damages often appear in concession contracts. For example, in Antofagasta, the concessionary Antofagasta Terminal International (ATI) invests in the reconstruction of sites 4 and 5 with anti-seismic norms, and reinforces anti-seismic protection in site 6. Similarly, the Port Authority of Antofagasta published bids to conduct works reinforcing quay 1. In addition, SEP promotes collective insurance contracts for port infrastructure, which covers – among other elements – the damage from seismic events, which has allowed for important post-earthquake reconstruction works.

The Chilean government cooperates with Japan on the SATREPS-Tsunami project (Science and Technology Research Partnership for Sustainability) to reduce the impacts of tsunamis. One of the goals of this programme is to improve the resilience of port activities to tsunamis. In March 2016, a seminar took place in Valparaiso to prepare guidelines for the elaboration of plans to ensure the continuity of trade in Chilean Ports in case of tsunamis ("*Guias para la elaboracion de planes para la gestion de la continuidad de negocios en puertos de Chile*"). The port of Iquique would serve as pilot

project, under the supervision of the Direction of Port Works from the Ministry of Public Works. The terminal operator of the Port Authority of Antofagasta builds a breakwater for 6-metre high waves, which is the standard biggest wave in 100 years.

Limiting congestion

A strategy to avoid congestion from freight transport to and from the ports is the development of logistic centres and truck parking areas. Conditions to develop a logistic centre are that there is land available, and that the use of this land does no conflict with the *Plan Regulador Comunal*. Logistic centres are planned by joint initiatives gathering the State and the private sector. For example, the Logistic Platform of the Bio Bio Region is the result of co-ordination between public entities (Regional Government, MINVU, MOP, Corfo), a public sector shipbuilder (Astilleros y Maestranzas de la Armada [Asmar]) and a private developer (Immobiliara Parque Andalien). The project takes place on a plot of land of the metropolis of Concepcion (900 ha), hence authorised uses are defined by the *Plan Regulador Metropolitano de Concepcion.* The location is close to several ports, the airport Carriel Sur, several roads and a railway.[13]

Similarly, the ZEAL (*Zona de Extension de Apoyo Logistico*) in Valparaiso was designed to reduce waiting time of trucks, and decongest the city of Valparaiso. Trucks do not have to enter the city anymore; they transit via a dedicated road called the *Camino de la Polvora*.

Another measure to avoid congestion and pollution is the regulation of freight truck traffic in the Santiago Metropolitan Region and other cities. The main restriction comes from the DS 18 of 2001, which forbids the circulation of the biggest trucks (above 18 000 kg) within the ring delimited by the Anillo Americo Vespucio at peak hours (between 7:30-10:00 a.m. and 6:00-8:30 p.m.). At the level of municipalities, there are ordinances regulating traffic. For example, in Santiago, the Ordinance 79 (1998) restricted the circulation of polluting trucks by according more flexible hours for charging and discharging to electric/natural gas vehicles. In Valparaiso, the Resolution 3150 Exenta (2008) prevents all freight vehicles above 10 tonnes within the city, between 5 a.m. and 11 p.m. Freight vehicles going to the port can use the southern access route via the tunnel dedicated for traffic between ZEAL and the port.

Port-city relations

One of the objectives of the 1997 Port Reform Law was to develop more harmonious port-city relationships, given that the 10 public ports are situated in cities of more than 40 000 inhabitants. It introduced the creation of Port-City Committees (*Consejo de Coordinacion Ciudad-Puerto, CCCP*) for each port authority (law n°19 542, art. 50d). The idea of "harmonious relationships" between ports and cities was already presented as an objective of the reform by the government in 1995, although CCCPs were not in the initial legal project of 1995 and are the result of compromises. The Port Reform Law does not give concrete modalities of application for the Port-City Committees. It mentions they should at least be composed of a representative of the Regional Government, and a representative of each municipality of the port area (art 50d). In practice, many Port Authorities have not created the CCCPs. In 2015 the MTT aimed at revitalising these committees through the introduction of an indicator in the *Planes de Gestion Anual* measuring the degree of proactivity of the port authority in creating CCCPs. Port Committees only concern public ports, while no mechanism of port-city dialogue has been created for private ports.

In addition, port authorities developed new strategies of communication striving for more transparency and integration with municipalities. In terms of transparency, each port authority publishes its master plan, investment plan and calls for tenders. Concerning integration with citizens,

most port authorities include a section on the city in their website. They display various initiatives to develop a sense of community between the port and the urbanites, such as a Christmas event in the port of Iquique, a photo exhibition of the porteños on Valparaiso's website, suggestions of touristic sites on Puerto Montt's port website. Some port authorities also have a section on the environment, such as Arica, which got a prize (*Premio Empresa Verde*) for its initiatives to convert Arica into a Green Port. In San Antonio the project of *Participacion Ciudana Anticipada* aims to inform people about the state of advancement of the PGE and gather information on people's expectation through questionnaires.[14] Private ports and terminals have also contributed to financing facilities in cities and communities, such as schools, sport facilities, or hospitals.

Until the creation of the port committees, there were no mechanisms of co-ordination between ports and cities on territorial governance. In the Port Reform Law, there is no rule obliging or inciting port authorities to consult with other actors influencing territorial planning, –the Ministry of Public Works, the Ministry of Urbanism, the Ministry of Transport, municipalities, regional governments, DIRECTEMAR, and the Ministry of National Assets. Several land use instruments exist related to port and urban land, but there is no rule to co-ordinate them: port authorities publish their *Plan Maestro*, municipalities produce a *Plan Regulador Comunal* or Intercomunal, and Regional Commissions of Coastal zones plan the uses of the coastal zone. Port authorities do not participate in the Regional Commissions of Coastal zones.

The consultative commission on decentralising (*Comision Asesora Presidencial para la Descentralization y el Desarollo Regional*) (CAPDDR) recommended a new tax on port activities with 50% going to the municipality and 50% to the region.[15] The commission also suggested the participation of mayors in the *Directorio* (executive board) of port authorities). Furthermore, it recommended a modification of the system of public companies, placing them under the responsibility of the region instead of those of the central government (CAPDDR, 2014). None of these proposals were implemented so far.

Notes

1 http://www.mtt.gob.cl/pdl.html

2 "Ha sido diseñado como un proceso de planificación continua y participativa, que incorporará progresivamente distintas componentes del desarrollo portuario, así como la visión y propuestas de los distintos actores que integran el sistema portuario nacional".

3 https://www.camara.cl/pdf.aspx?prmID=31865&prmTIPO=DOCUMENTOCOMISION

4 Relevant users are defined as "any user -or the business group it belongs to or any member of the latter, who transfers a significant amount of cargo the corresponding administrative region and in the corresponding anchor front" (OECD, 2011).

5 Decreto 406 Exento, 2011, Ministerio de Bienes Nacionales.

6 The tax on diesel was established by the law n°18 052 (art. 6), 1986.

7 For a merchant ship to be registered in Chile, if the owner is a society, its main residence and effective office must be in Chile. The president, manager and the majority of the direction must be Chilean. In addition, the majority of the equity must belong to Chilean natural or legal persons (DL 2222 art. 11).

8 Impulso Competitivo is an agenda of 50 actions, designed to remove obstacles hampering capacities development. It is the result of co-operation between public and private actors, gathered in 10 thematic commissions (agriculture, tourism, new technologies, logistic and transports for example).

9 (Acuerdo de complementacion economica MERCOSUR Chile, art. 33, Titulo II Integracion Fisica): "Los Estados Partes del MERCOSUR, cuando corresponda, y la República de Chile, asumen el compromiso de perfeccionar su infraestructura nacional, a fin de desarrollar interconexiones de tránsitos biocéanicos. En tal sentido, se comprometen a mejorar y diversificar las vías de comunicación terrestre, y estimular las obras que se orienten al incremento de las capacidades portuarias, garantizando la libre utilización de las mismas. Para tales efectos, los Estados Partes del MERCOSUR, cuando corresponda, y la República de Chile promoverán las inversiones, tanto de carácter público como privado, y se comprometen a destinar los recursos presupuestarios que se aprueben para contribuir a esos objetivos."

10 (DL 617, 1974)

11 Law n°12 041, 1956, art. 22.

12 http://www.leychile.cl/Navegar?idNorma=122591

13 http://www.plataformalogistica.cl/pdfs/BioBio-MasterPlan-SPA.pdf

14 http://www.sanantonioport.cc.cl/html/participacion/Troncal_Puerto_San_Antonio.pdf

15 "Se crea la tasa portuaria a las empresas portuarias concesionarias y no concesionarias, según tipo de carga a aplicar por tonelada. La puesta en marcha no será inmediata, sino gradual, comenzando el año 2016, estableciendo que el monto máximo corresponderá a U$ 0,5 por tonelada a alcanzar en un plazo de cinco años."

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Chapter 3. Assessing port policies in Chile

How effective is Chile's port policy? How does it contribute to achieving high port performance and positive port impacts? This chapter will answer those questions by linking the main challenges identified in Chapter 1 to the policies described in Chapter 2. In this process, the main policy challenges identified are related to performance with respect to maritime forelands, port operations and hinterland connectivity, as well as economic, environmental and traffic impacts.

Are ports policies adapted to maximise performance?

This section relates back to the challenges to performances highlighted in Chapter 1, following the same categorisation of challenges: namely with respect to maritime forelands, port operations and hinterland connectivity.

Table 3.1. **Main port performance challenges and their link to policies**

Performance	Main challenges	Link to policy
Maritime foreland	Low maritime connectivity	Dual port system
	Frequent port closures and high ship waiting times	Limited performance incentives for pilotage services
Port operations	Frequent strikes	No structural labour negotiations
	Imbalance of import and export cargo	Dual port system
Hinterland	Limited coastal shipping	Very restrictive cabotage laws
	Limited use of freight rail	Lack of a multi-modal strategy
	Truck waiting times, connection to highways, dry ports	Mandate of ports restricted to port area

Source: Own ITF/OECD elaborations.

A dual port system

Scale is essential for high port performance. This is the case for maritime connectivity, port operations and hinterland connections. More ship calls means more connections to other ports, more port activity could mean economies of scale in port operations, and a steady and solid volume of cargo means that a wide variety of hinterland connections in different modes becomes possible. However, Chile has a large collection of medium-sized and fairly small ports, as was illustrated in Chapter 1. The largest ports in other countries tend to be relatively larger and thus benefit more from scale effects in maritime connectivity and hinterland connections. Limited scale of the Chilean ports has clear consequences for the performance of the port system. The largest Chilean ports suffer from relatively low maritime connectivity, low shares of rail hinterland transport and poor connections of ports to surface transport networks. A more limited number of larger ports could have led to ports that are better connected with other ports and with the hinterland.

This situation is related to the proliferation of private ports. As mentioned before, Chile has a dual port system with public and private ports –and different ministries that are in charge of these: the Ministry of Transport and Telecommunication for public ports and the Ministry of Defence for private ports. The number of private ports increased from 22 in 1994 to 52 in 2014, whilst the number of public ports remained stable at twelve (administered by ten public port administrations) over that period, according to the Ministry of Transport and Telecommunications. The Ministry of Defence has neither a mandate nor an obvious interest to develop a coherent freight transport system. There is no justification of amounts to be paid for maritime concession. The minimum concession fee of 16% was raised to 50% in 2013 for new maritime concessions without clear justification. In 2014, a Navy resolution (*Subsecretaria para las Fuerzas Armadas*) resulted in this concession rent reaching 100% of the land value (Camport, 2016).

Proliferation of private ports is facilitated by a legal framework that leaves much discretionary power to the Ministry of Defence. Criteria for awarding maritime concessions are not included in the law, so the formulation of the criteria is up to the Ministry of Defence. Guidelines by the Ministry applied for assessing proposals for the same coastal area include four criteria: national security, value of the project, job creation and community relations. However, it is unclear how these indicators are weighted. The awarding of maritime concessions seems to be stimulated by the fact that every rejection by the Ministry of Defence of a proposal for a concession needs to be justified, so as to provide solid grounds for denying the application.

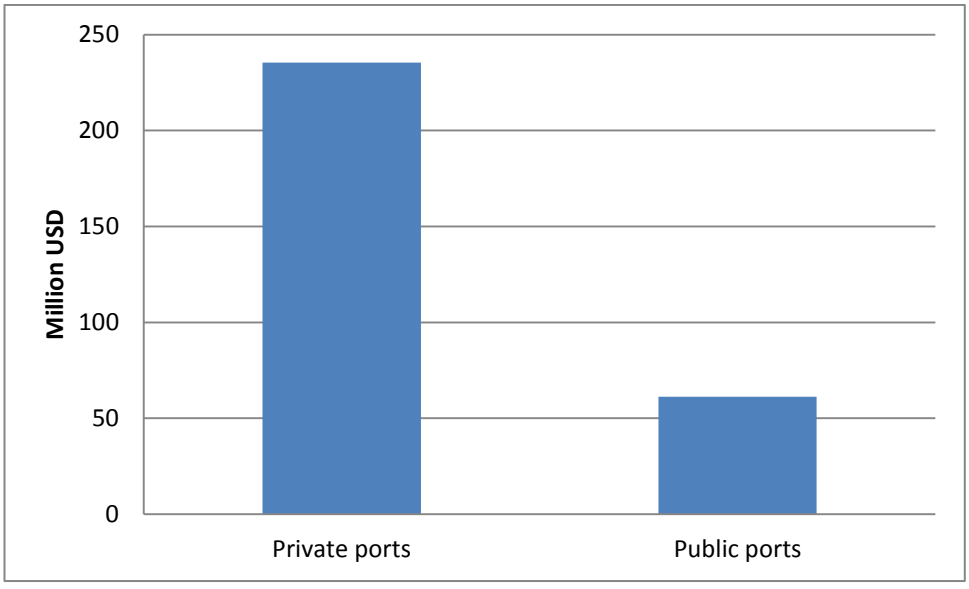
The development of private ports takes place almost regardless of national transport policy. The Ministry of Defence consults the Ministry of Transport and Telecommunications (and other concerned ministries) when it receives a request for a maritime concession, but it has no obligation to take their position into account when deciding on the granting of the concession. Although there is a national ports master plan, this only covers the public ports. There is a national coastal planning, in which the Ministry of Transport and Telecommunications is involved, but only as one of 30 other actors. Moreover, only in two of the 18 regions has this national coastal plan been translated into a regional coastal plan.

In the process, private port development generates additional costs for the public sector. Maritime concessions are granted without assessment of the investments needed to connect the port to the hinterland. In some cases, private ports have managed to lobby for road connections that the public ports in the same region have not attained yet. E.g. data by the Ministry of Transport and Telecommunication show that in the Bio Bio region public infrastructure investment related to the public port of San Vicente reached USD 61 million over 1994-2016, public investment related to the private ports of Lirquén and Coronel over the same period was USD 104 million and USD 132 million respectively (Figure 3.1). In addition, the increase in the number of customs offices and officers needed for the new private ports is paid from the public budget.

Private ports also engage in competition with public ports, possibly in an unfair way considering their different status. Public ports cannot engage in price differentiation the way that private ports do; unlike private ports, public ports are bound by the principle of non-discrimination. So private ports could, for some customers, charge prices that would just cover their marginal costs, whereas public ports could only apply similar prices for similar customers; e.g. a volume discount for customers that bring in a certain minimum amount of cargo. Big shippers owning private ports – e.g. in the Bio Bio region – have reportedly pressured shipping lines to shift cargo to their ports away from the public ports. Considering carrier concentration and alliances, such pressure can have huge impacts for individual public ports. In some regions in Chile, this has resulted in declining market shares for public ports; e.g. in the Bio Bio region the public port of San Vicente-Talcahuano witnessed a reduction of its share from almost 70% in 2006 to 56% in 2014 (Figure 3.2). In addition, private port

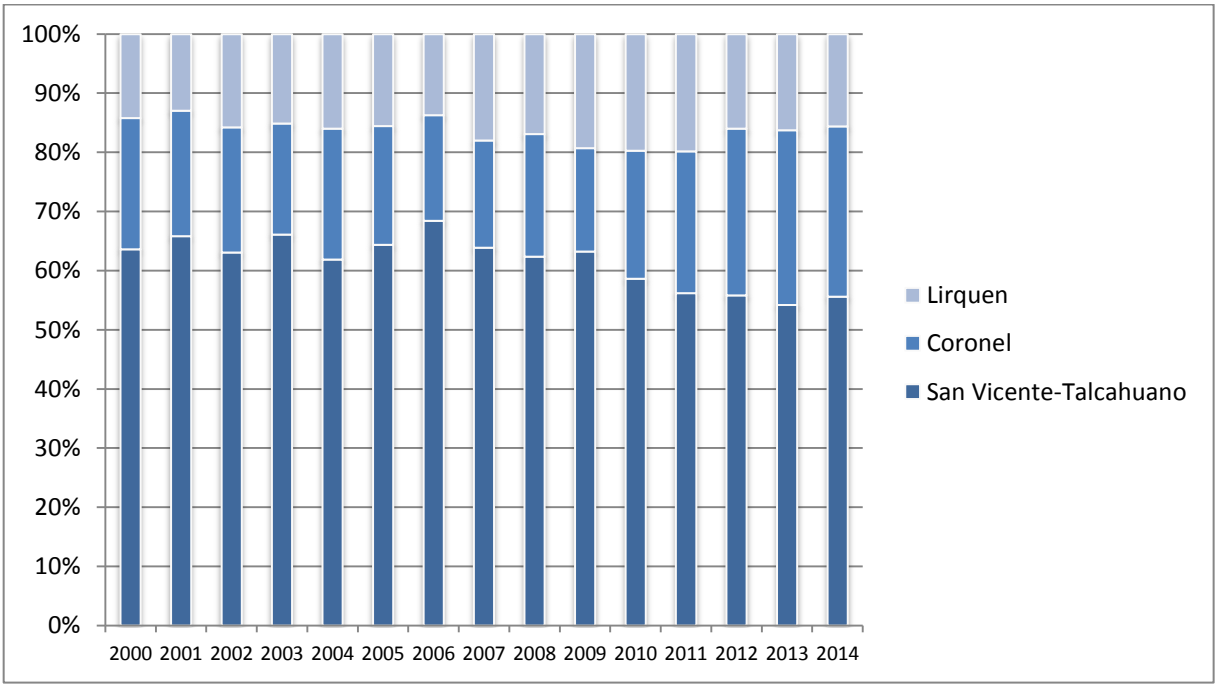
operations could be cross-subsidised by profits in other parts of the owners' vertically integrated business and, as such, offer port charges that a public port could not match. This can happen because private ports are not bound by the structural safeguards established by the Free Competition Court on limitations to vertical and horizontal integration. This is problematic in the cases where private ports offer services to third parties, but not when the port is exclusively used by its owner.

Figure 3.1. **Public investments in port-related infrastructure in the Bio Bio region (1994-2016)**



Note: Private ports: Lirquen and Coronel. Public port: San Vicente. See Annex 2 for the investments taken into account
Source: ITF/OECD elaborations based on data from Ministry of Transport and Telecommunications

Figure 3.2. **Market shares of public and private ports in the Bio Bio region (tonnes)**



Moreover, the system of maritime concessions has provided private firms with the possibility to block coastal areas for use by their competitors. There is a provision in maritime concessions that requires that they are used – and private investments take place – within a period of five years since the concession was granted. In practice however, concessionaires get extension periods, in many cases several times. So it is possible that concessions are not used for periods of 15-20 years. So maritime concessions could be considered a barrier to entry that private firms could use to hinder their competitors. At the same time, the number of bays in Chile that could be used for port activities is fairly limited, so there are opportunity costs to the proliferation of unused maritime concessions.

The government's social agenda could also be enhanced with a stronger focus on public ports and tying private ports closer to the public interest. Various private ports for private use are currently serving as dedicated ports for big shippers, mostly large exporting firms for the mining and timber industry. The competitiveness of these ports serves the competitiveness of these firms, which might indirectly – and to some extent - translate in jobs for Chileans and tax revenue for the Chilean government. The Chilean population, however, has arguably more direct benefits from cheap imports of consumer goods, as this will translate into lower prices for the goods that they consume on a daily basis.

Finally, the port system is affected by the speed of decision-making procedures. The economic and social cost of postponing decisions is not adequately internalised by the relevant political decision makers. This may not be specific to ports policy, but to policy-making in Chile in general, as there frequently is no incentive to adopt decisions quickly.

Limited performance incentives for pilotage services

Ship waiting time in Chilean ports is relatively long. Pilot stations cover multiple ports in fairly large areas; related to the fragmentation of the port system, most of the time pilots still travel from one port to another when their services are needed. In some ports, only one pilot boat is in use, so in case of repairs on this boat, a replacement has to come from another port. Shipping lines mention that in such cases, they have considerable waiting times before getting a pilot. A frequent complaint concerns situations of bad weather when all ships have to be manoeuvred into safe bays, and out again when weather has cleared up. As there are not enough pilots for such situations, this can take a lot of time.

The long ship waiting time is linked to limited performance incentives for pilots. Pilots do not have a personal incentive to be efficient, as every pilot gets paid the same amount of money from a common pool. The fee structure for pilotage services might actually lead to inefficiencies. Some observers estimate that pilots may have an incentive to invoke bad weather and safety reasons to deviate routes because they are paid per move. As maritime pilotage is a monopoly in Chile, there is no alternative for current services. For Chilean-flagged vessels, pilotage both on port or in waterways is compulsory, except when her master is qualified with the "Sea Pilot Exemption for route navigation" issued by the Maritime Authority.

Pilots are linked to the Navy, which leads to distorted incentives. Most of the pilots are retired high-ranking officers, including admirals, so they are higher in the military hierarchy than harbour masters. There is speculation that pilots use their position to pressure harbour masters to close ports when weather conditions get rough. Port closures happen frequently; e.g. San Antonio was shut down 38 days in 2015. However, the criteria for port closures are deemed arbitrary and shipping lines estimate that the number of days of port closures could be reduced by 25%. They also criticise the fact that each port has its own criteria for closing, which makes closures unpredictable.

In addition, shipping lines highlight that current manoeuvrability studies are not appropriate for defining closure conditions, because these have not been updated with new developments in ship size and port conditions. As a result, pilot's decisions with regard to the number of tug-boats required are sometimes perceived as arbitrary and overly cautious. In addition, pilotage tariffs are regulated by the Navy, the former colleagues of pilots, which might present a risk for conflict of interest. Although the possibility of pilot exemptions exist in Chile, the decision on this is taken by the Maritime Authority that might not have an incentive to limit a revenue source for Navy staff and retired admirals by giving out many pilotage exemptions. It should be noted that in no other OECD country is the Maritime Authority part of the Ministry of Defence.

No structural labour negotiations

The main issue affecting performances at the port operations level is the high number of days of strikes paralysing port operations. Although port strikes are not exceptional throughout the world, Chile is one of the most conflictive countries of South America for port workers. In 2014, a port strike caused an estimated loss of USD 200 million to fruit exporters. Camport calculated that 20 days of strike cause a loss of over USD 500 million, taking into account costs for storage, loss of value of perishables and delayed imports (Camport, 2015). The high level of conflicts is linked to mediocre labour conditions, high rates of temporary workers and the lack of institutionalised space for negotiations. This is part of a larger phenomenon of labour union influence on ports, found in other countries as well (Box 3.1). E.g. in many ports, operators cannot decide on operational issues, such as how many people will be in a gang. There are also more positive experiences, e.g. in the port of Valparaiso where a relation of mutual trust between port, terminals and dockworkers was built, reducing the number of inactive days and shifting from a temporary to a more permanent work force.

Box 3.1. **The impact of unions on port labour: The case of the United States**

Unions have had and continue to have a large impact on port labour systems. Dockworkers of the 2010s have little in common with those of the 1950s or 1930s, except for a culture that continues to form the basis of a collective identity in which trade unionism is still very much a active force, according to Pigenet (2012). Political and economic structures can outlast the people who initially created them, providing a pool of tradition and resources on which workers can draw (Carmichael and Herod, 2012). Militancy in Merseyside (England) has been sustained over time, even as industrial restructuring has devastated employment on the docks and in the region's car plants, from which it initially emerged (Darlington, 2005).

How unions can determine the outlook of port labour can be illustrated by the different pathways of the ILWU on the United States' West Coast and the ILA on the East Coast. The ILWU developed a strong and co-operative dock regime based on participatory democracy and union capture of hiring, which enabled union leadership to negotiate effectively with members and employers. In contrast, the ILA developed a weak and non-cooperative dock regime based on localist politics and without capture of hiring, making it hard for union leaders to negotiate effectively. These different pathways have led to different outcomes: the ILA has a loose master contract and local contracts; has lost control of certain technologies and jurisdiction; and is a weak bargaining force (Kelly, 2008). This has had an effect on port workers' earnings. Although dockworkers on all three US coasts are the notable exception to the trend that port-logistics workers in large port-cities do not achieve higher annual earnings than otherwise comparable workers. This is particularly the case on the US West Coast, where residence in one of the large port-cities is correlated with additional significantly higher earnings, benefiting – among other things – from the strong bargaining power of unions (Hall, 2009).

Source: OECD (2014).

The mediocre labour conditions in Chilean ports are related to limited application of international norms. Examples of these include the absence of maximum working hours for temporary workers, the absence of basic health insurance or pensions and even the absence of basic facilities in ports such as women's toilets or locker rooms. These poor conditions might be related to a fairly passive legislative approach. Chile has not ratified key conventions of the International Labour Union (ILO) related to port labour. Chile has neither ratified the Dock Work Convention 137 (1973) on social repercussions of new methods of cargo handling, nor the Convention 152 on security and hygiene for dock workers, although only a few countries have ratified these two conventions. Chile has ratified general conventions such as the Promotional Framework for Occupational Safety and Health Convention 187 (2006), and the Maritime Convention (2006). Dockworkers in Chile are covered by the Labour Code Law n°20 773, the Dockworkers Law n°16 744 and Decree 90. The state of worker consultation is not very sophisticated, so that most of these concerns cannot easily be channelled to port and terminal executives.

Labour conditions are particularly severe for temporary workers that make up around two-thirds of the operational workers in ports. Workers have a short-term interest in being a temporary worker, because in many cases their daily salary could be higher, so it might be more attractive for workers. Unions have an interest in sustaining higher temporary workers' shares because they can thusly continue to assign work and maintain a dominant position. In a way the costs of the system affects cities: temporary workers have limited health insurance and pension rights, so cities end up providing some basic services to these groups. Moreover, temporary jobs affect commitment to the job, trust between actors and the level and development of training. The shifts of temporary workers are regulated, but there is a lack of control on repeating shifts. For this reason, Directemar and the Labour Department are currently working on a system of monitoring compliance with labour standards.

The high strike rates can also be explained by a lack of structural consultation and negotiation between employers and employees. Most negotiations are done on a case-by-case basis, so that there are no standards and no predictability for both workers and employers. This does not stimulate trust among parties and weakens trade unions, which tend to place them in a defensive and confrontational position. Neither at the local level nor at the national level is there a body in which employees and employers could discuss policies. Legal instruments for arbitration between employees and employers are lacking, which means that strikes can drag on without any immediate perspective on possible solutions.

Very restrictive cabotage laws

Coastal shipping is not a competitive transport mode. It is expensive and there is no extensive network of services, so it can take a long time for shippers to get their goods shipped to the destination. As coastal shipping is currently exclusively done by ship operators, coastal shipping is not very well integrated in the supply chain, so it is not an attractive option for exporters and importers with shipments spread out over the whole country. In ports, domestic cargo from coastal shipping gets similar treatment as international cargo, such as custom and other inspections. Moreover, domestic cargo has double terminal handling charges. Not surprisingly, the amount of coastal shipping in Chile is fairly limited. However, Chile's geography, stretched out over the lengthy coastline, provides unique opportunities to develop coastal shipping.

The development of coastal shipping in Chile is hindered by very strict cabotage laws. These laws stipulate that cabotage should be carried out by Chilean-flagged ships and Chilean companies with Chilean crew. Foreign companies can apply for a waiver, but the waiver is connected to high additional costs and bothersome procedures and transaction costs, so foreign companies do not bother to apply, as there is no business case for them.

The result of these cabotage laws is higher supply chain risks, transport costs and road congestion. Cabotage brings risks for the supply chain, because shippers in various sectors, such as car importers and fruit exporters become very dependent on one port (San Antonio), which constrains their resilience: if there is a strike, an extreme weather event or another problem, this could mean disruption in that supply chain with severe repercussions. Strict cabotage rules entail higher transport costs, amounting to tens of millions US dollars for certain companies. Strict cabotage rules imply truck traffic between Chile's central regions and the other regions that would otherwise not have taken place (as the flows would have been on a ship); this contributes to road congestion.

Strict cabotage laws also sustain a system of inequitable regional development. In the current system, the lion's share of the imported goods to Chile pass through San Antonio and Valparaiso, before being trucked to other parts of the country. For some of Chile's exports, even if these come from throughout the country such as fruit exports, a similar exclusive use of the ports of San Antonio and Valparaiso is made. This means that the logistics activity and employment related to these cargo flows is located there rather than in the places in Chile where production or consumption takes place.

In addition, strict cabotage laws also make it difficult to correct the unbalanced import and export flows in Chilean ports. This unbalance is linked to the fragmentation of the port system. Rather than having a fairly limited number of large ports with both import and export flows, the fragmented dual port system has generated a large set of private ports mostly destined for exporting the goods of their owner, whereas a few of the public ports in central Chile concentrate most of the import flows. The result of this unbalance is the need for extensive repositioning of empty containers. Most of the private ports are in constant need of containers, whereas the public ports in central Chile have an oversupply of empties. A liberalised coastal shipping system could re-equilibrate this by providing more import cargo to the ports other than the public central ports. So, having strict cabotage laws sustains systemic inefficiencies. Empty containers are not covered by the cabotage laws, which allows for empty container repositioning, but more liberalisation could take away the need for such repositioning. A cabotage reform was discussed in Congress in 2012 to open cabotage to competition, but several important lobbies opposed it such as the National Ship Owners Association (*Asociación Nacional de Armadores*, ANA), and the National Confederation of Truckers.

However, coastal shipping is indispensable for the connectivity of remote regions with the rest of the country. Consequently, the State has an important role to ensure the existence of transportation services with these regions, for their inhabitants to be integrated to the rest of the country.

Lack of a coherent multi-modal strategy

Ports in Chile are very dependent on trucks for their hinterland connectivity. The average share of rail in the modal split of Chilean ports is low. Generally the highest rail shares are achieved in selected ports – mostly private – with a dedicated rail connection between mine and port (Antofagasta), or production facility and port (Lirquen/Coronel). Most of the other ports, in particular import ports such as the large container ports in central Chile, have low rail shares.

More multi-modality in port hinterland transport is a critical issue for the Chilean ports system. With the volumes that are projected for its ports, in particular in central Chile, hinterland transport would be essential to avoid congestion in the main port-cities and on the main highway axes in Chile. This is acknowledged in Chilean policies: in the plans for the Mega-Port in central Chile (PGE) a minimum of 30% rail share in the port hinterland modal shift is mentioned. For this to be achieved a paradigm shift would be needed. Chile currently lacks a coherent multi-modal strategy for freight, which shows in various ways including in the lack of investment and priority to rail freight, inappropriate governance, underutilisation of private rail networks and subsidies to truck transport.

The lack of multi-modality in Chile also relates to very strict cabotage rules that constrain the possibilities of effective coastal shipping and limited dry port development.

Freight rail transport suffers from a cumulated lack of investment, both in rail networks and equipment. The lack of investments in networks translates into connections without double tracks, inappropriate rail-road crossings, and lacking connections to port terminals. So a multi-modal strategy for Chile should include strategic investments in rail infrastructure. This seems to be acknowledged, considering on-going discussions on the necessity of public investment in the rail connection between San Antonio and Santiago. At the same time, as previously mentioned, the prospects of expanding rail passenger services on that same railway line can limit rail freight expansion and should be assessed alongside freight development options.

The limited uptake of freight rail transport is also related to the governance of the state railway company, Empresa de los Ferrocarriles del Estado (EFE). Despite a substantial envelope for improving freight rail transport, EFE has not been able to secure the private sector interest needed to unblock the funds. This might be related to a lack of entrepreneurial spirit among EFE executives, limited political pressure on EFE to achieve more freight rail transport, and the general priority given to passenger rail instead of freight rail.

As part of the railway network in Chile is private owned, in particular in the north and in relation to mining, higher uptake of freight rail could also be realised by increasing the access of other parties to the private rail network and services. Although this possibility exists legally, it is not common practice. The incumbent operators probably have no interest in opening up what is basically a dedicated rail service to their company, as it risks slowing down operations. However, this option does not even seem to be considered or explored.

The limited uptake and attractiveness of freight transport by rail can also be explained by subsidies to trucks. There are various elements to this. The sector is laden with a legacy of subsidies for fleet renewal in the 1980s. Current subsidies consist of fuel subsidies and limited internalisation of external effects. Truckers benefit from a tax credit on the tax on diesel[1] (law n°19 764, 2001), and cargo transport companies owning or renting a truck weighing more than 3 860 kg may recoup a percentage of the tax on diesel under the form of a tax credit on the VAT (art. 2). This tax credit is currently about 25% but it exceptionally went up to 80% between 2008 and 2009 following a strike (law n°20 278, 2008).

An example of the limited internalisation of external effects is evident from the toll tariffs that truckers pay: truck toll payments do not cover the damage caused by the trucks in terms of road deterioration for which maintenance costs are incurred. Trucks on roads under concessions only pay half of the calculated costs of their damages: USD 0.041 versus USD 0.085 per km per trucks with two axles, and USD 0.093 versus USD 0.182 for trucks with more than two axles (Hoffman, 2001). Similar issues exist in other parts of the world where attempts are starting to be made to internalise costs of trucking (Box 3.2). Freight transport by truck is cross-subsidised by other road users, also related to strong lobbies of the trucking sector that have managed to halt reforms that they perceived to be harmful to their position.

There are various examples in Chile of smoothening cargo flows at the port gate. For example, the ports of San Vicente, San Antonio and Valparaiso have a system of truck appointments. In the ZEAL of Valparaiso trucks can be tracked from their arrival to the port area until their departure. Trucks cannot go down to the port, before they are given the authorisation (Box 3.3). This allows reducing congestion and smoothing port traffic. In the case of San Vicente, the terminal operator SVTI has also implemented a system in which the terminal has to pay fees if trucks wait over 30 minutes in

the port area (Box 3.3). Such a measure could be generalised among the Chilean port network to reduce waiting times. In San Antonio, the terminal operator estimates that traffic could be smoother if the port had more capacity to deal with its surrounding area, and its road accesses.

Box 3.2. **Towards internalisation of external costs of trucking in Europe**

Europe has, like Chile, an issue with external costs of heavy goods vehicles (HGVs) on European roads estimated at EUR 143 million in 2013 (Schroten and Aarnink, 2015). Of these external costs only 30% are covered by the toll revenues they generate. One truck causes as much damage to roads as 10 000 cars. They also represent 25% of the emissions attributable to road transport in Europe. Many European countries have decided to implement toll pricing systems that better integrate the costs that their networks have to bear due to HGVs, but in light of these findings it seems that there are still some steps to take to fully recover the costs of HGVs on European roads. Toll pricing systems can be used for different purposes depending on the way they are designed. This can be a way to deter the use of trucks for freight and incentivise the use of other transport modes such as rail, short sea shipping or inland waterways. They are also useful to differentiate tariffs among trucks in function of the CO2 they produce so that trucking companies have an incentive to purchase cleaner vehicles.

To date Austria, Belgium, the Czech Republic, Germany, France, Greece, Hungary, Croatia, Ireland, Italy, Poland, Portugal, Slovakia, Slovenia and Spain have distance-based road charging. However, only Germany, Poland, Hungary, Austria, the Czech Republic, Slovakia, Portugal and now Belgium have a km-based system that enables better coverage of the network compared to fixed gates. The Netherlands, Luxembourg and France are the only centrally-located EU countries that have no km-based road charging (although France does have many toll highways).

Box 3.3. **Truck appointment scheme in San Vicente**

The concessionaire of the Port of San Vicente, SVTI, implemented a platform called Container Express to reduce truck waiting times in the port. Exporters can book an arrival time online, validated by the port in co-ordination with the customs services. Then, the average service time in the port is about 15 min. In addition a time slot can be booked to pick up an empty container or an imported container, which allows coupling export and import tasks during the same trip; this minimises the number of journeys, hence participating to reduce congestion and emissions. Finally, truck circulation was made more fluid with the implementation of a "Stacking Pass", a system certifying that administrative procedures are completed with the reception of an SMS by the truck driver. This SMS can be shown if required.

This system has limited previous tensions between ports and truckers due to high waiting times which can reach three to five hours in other ports. In San Vicente, waiting times do not exceed 30 min and if this is the case, the port has to pay a penalty of USD 20 per hour, paid per minute. If the truck is late, it has to park in a designed area and re-book an appointment.

Source: Mundo Maritimo (2015).

Mandate of ports restricted to port area

Ports in Chile generally pay limited attention to what happens outside the port area. An indication of this is the limited information that exists on the economic and environmental impacts of port activities; moreover, the information that is available seems to have been assessed without involvement of the port. As a result, many ports have not been able to respond effectively to concerns of citizens of port-cities on the impacts of current or future port activities. Even with regards to port

operations, the focus is mostly inward-looking, e.g. on utilisation of terminal space, rather than the integration of the port into a wider transport system.

This lack of external orientation of Chilean ports presents an important challenge for the future. The future competitiveness of Chilean ports will be determined by the smoothness of their connections to the hinterland. With the globalisation of terminal operations, especially for container terminal operations, a certain harmonisation of performances has taken place, with the possibility for many terminals to duplicate and implement international best practices. This is much more complicated with regards to hinterland connectivity, as the variety is much larger here. The long term "license to operate" of ports in Chile will strongly depend on the way they can co-exist with cities and their citizens, so sensitivity to mitigating negative impacts from port activity would be essential for sustaining port functions in urban areas.

The lack of external orientation of Chilean ports is related to their official mandate. The law n°19 542 (art. 6) mentions that port authorities exercise their functions within the port area, on the land and infrastructure they administer. This implies that they are not responsible for what happens outside the port area, e.g. road connections. In addition, port authorities are limited in their function by the lack of financial means, as a large share of their profits is taxed or retrieved. This translates into the way ports are governed. The official port performance indicators focus on what happens inside the port, so look at crane performance and space intensity, but do not actually measure time to get cargo in or out of the port, or hinterland connectivity for that matter. The provisions in concessions granted to terminal operators seem predominantly to refer to required cargo volumes, but no wider societal criteria, such as targets for modal splits, air emissions and local employment, seem to have been included. Port management is assessed on certain port performance indicators, but also these are purely internal port operational indicators.

In addition, port management can be held personally accountable in a court of law for their activities, so understandably a culture of risk aversion is predominant. Article 7 of the law n°19 542 provides that Port Authorities follow the regulations for exchange-traded corporations ("sociedades anonimas abiertas"). This places them under the regulation of the Corporation Act (*ley sobre sociedades anonimas*). The Corporations Act (law n°18 046) establishes the general principle that directors are personally liable (jointly and severally) for damages caused by negligent or intentional actions. The law prohibits bylaws to limit such liability.

The law gives Port Authorities the mandate to administer, exploit, develop and conserve ports as well as the related activities inherent to the port domain (law n°19 542, art. 4). In addition, the port boards have the mission (among others) to ensure that expansion possibilities are not hampered (art. 31). Despite these provisions, the possibilities in practice are fairly limited. Expansion of ports is only possible in adjacent zones of the existing port; although it is not impossible to expand ports elsewhere, a special decree is necessary to make this possible. Similarly, the development of dry ports and truck waiting areas is only possible in the same municipality; considering that most of Chilean ports are located in cities, space for such areas is not always easily available.

Despite these constraints, there are some examples of ports that have managed to take a wider perspective. The port of Arica has developed advanced environmental programmes; ports like Valparaiso and San Antonio have created opportunities to communicate and create goodwill with local citizens. ZEAL in Valparaiso is a good example of decongesting the port-city by developing a truck waiting area outside the port (Box 3.4).

Box 3.4. **Valparaiso's logistics centre ZEAL**

The ZEAL logistics centre is an example of innovation benefitting both the port and the city. It was set into action by the Valparaiso Port Authorities, together with the Municipality of Valparaiso, and the Ministry of Public Works (MOP). The space occupied by the ZEAL was attributed to the Valparaiso Port Authorities after the MOP issued an expropriation decree on this land (Decreto 1024, 180 (2005) and 710 (2006)). In the mid-1990s, the Port Authority of Valparaiso inaugurated its dry port 11.6km away from the port. This was a way to address space constraints in the port of Valparaiso, in the context of a growing port activity. The dry port benefited from additional space for trucks parking. The benefits were twofold: first, it diminished congestion and waiting times, hence improving port performances. Second, it eased tensions with the city, as the noise, pollution and traffic-jams related to trucks were displaced away from the city centre.

The ZEAL itself was created in 2008, not only as a parking space, but as a logistics centre. It was designed to reduce control times by centralising the activities of the various agencies - customs, health services, as well as the Fishing, Agriculture and Livestock agencies. This represented an investment of USD 28 million from EPV and the private sector. In 2009, following a public tender, a concession on the ZEAL operation was granted to the Spanish Group AZVI with an additional investment of USD 21 million. One of the conditions of the concession contract was to hire people from the city for the works.

The ZEAL allowed improving port performances by making logistics and control activities available 24 hours a day and seven days a week. It also helped to better track trucks along their way to the port on the Camino La Polvora, which connects the ZEAL to the port with the TAG system of cameras and tolls. Overall, the average stationary time in the port decreased by 65%, control space increased by 26% and parking space by 15% (Moreno et al., 2010). The customs agency also ensures the automatic registration of export documents. Finally, the ZEAL benefits the city by reducing the trucks flow within the city, and allowing a better access to the coast for urbanites, through the decongestion of axes such as the road Acceso Sur.

Are port policies designed for generating positive impacts?

Table 3.2. **Main port impact challenges and their link to policies**

Impacts	Main challenges	Link to policy
Economic	Limited data on impacts No generator of high value added activities	City is not involved in port policy
Environmental	Limited data on impacts Large exposure to shipping emissions	Absence of policy
Traffic	Urban congestion	Lack of co-ordination between urban and port planning

Source: ITF/OECD elaborations.

Limited city involvement

Port-cities in Chile are generally confronted with the negative impacts of ports, without having much of the benefits. For example, there are no local port taxes, yet urbanites bear most externalities from ports, such as noise, congestion, pollution. Finally, as mentioned in the previous chapter, municipalities are affected by the gaps of the port labour legislation. For example, daily port workers who do not get social protection become a social liability for the city once retired, especially for health services, even if this also applies to other categories of workers. The public ports system in Chile

delegates responsibilities to public port authorities, but the system is controlled by the national government. Cities are not involved in the boards of ports therefore they have no say on ports master plans. In addition, there is no mechanism for the municipality to benefit from the profits generated by ports. The limited involvement of cities is not specific to the ports system, but part of a wider context of very limited responsibilities of cities and municipalities in Chile in general. As such, the issue is linked to the wider debate on decentralisation launched in 2014 by the Presidential Consultative Commission on Decentralization and Regional Development.

Not surprisingly, there is a wide concern about the relations between ports and cities in Chile. According to a study released in 2015, 66% of actors of the port system (port authorities, municipalities, regional *Intendente*) estimate that ports have not developed in a harmonious way with cities. Only 4% of respondents consider that the relationship between the two has been "very harmonious" (Zrari and Alvarez, 2014).[2] It seems that the most conflictive issue (for 51.3% of respondents) is the "urban environment" (*entorno urbano*) understood as the competition for space and land uses between municipalities and ports. "Accessibility" is also a topic of disagreement, and finally "environmental impacts" on air quality, noise and visibility are also a concern.

The legal tool for port-city dialogue consists of the Port City Committees, but implementation has been slow. Several port authorities have not held committees yet, even if the instrument dates back to the 1997 Port Reform Law. The Chilean Maritime and Ports Association states that Port City Committees have so far had an irregular functioning, due to the lack of clarity of their mission, an absence of leadership to guide port city relations, and a general lack of trust (Camport, 2015). Similarly, a recent report *Una propuesta de institucionalizacion de los consejos de coordinacion ciudad puertos establecidos en el articulo 50 de la ley n°19542* identified the lack of institutionalization of Port City Committees as a cause of their non-implementation; it argues that the MTT has to release a Supreme Decree (*Decreto Supremo*) to regulate the constitution of these Committees. No mechanism of port-city dialogue has been created for private ports – except in Mejillones, because the main shareholder is the State through Codelco. Beside Port City Committees, there are no policies or incentives to generate harmonious relationships between cities and ports.

Cities currently reap limited economic benefits from their ports, as most of them have no tools to develop economic development strategies. However, there are interesting opportunities here that might be explored. Successful maritime clusters enhance the port's contribution to its surrounding city and region. For this reason, the formation of maritime clusters has been seized upon as a policy objective in many parts of the world, and governments now have at their disposal a diverse range of instruments that may help embryonic maritime clusters to merge and consolidate, and enhance mature clusters. However, the success of a given instrument for encouraging maritime clusters is context-dependent; the role of policy is thus to respond to locally identified needs and to encourage these tendencies only when this is logical in light of alternative uses of resources (OECD, 2014).

Absence of environmental ports policy

Little is known about the environmental impacts of ports in Chile. Ports do not systematically monitor these impacts, so ports generally cannot inform the citizens of their port-city on the extent of impacts and if these increase or decline. Environmental impact assessments are mandatory in case of new port development, but no such obligations exist for existing ports. With the exception of the port of Arica (Box 3.5), no port in Chile systematically monitors its environmental impact.

Environmental impacts from shipping could be substantial. Most of the larger ports in Chile are urban ports, so located in close proximity to urban population. As this population will increase its personal income, urban quality of life becomes more important. This development will raise more

concerns on the environmental impacts of ports. It is in the interest of Chilean ports to be prepared for a discussion on its environmental footprint; this means monitoring its effects and showing which measures are taken to mitigate negative impacts.

Box 3.5. **Green port policies in Arica**

The Port Authority of Arica (EPA) is the best performer in Chile regarding environmental issues. This represents a big shift considering the image of Arica in the late 1990s; at this time, citizens were becoming increasingly aware of the contamination risks linked to port activities. Indeed, as the port activity is based on the export of mineral concentrates from Bolivia, the city of Arica faces high levels of particle emissions (polimetales). Minerals were stocked in the urban zone, and populations living close to industrial districts such as Cerro Chuno, were very vulnerable to the pollution generated by the port mineral export activities. EPA and its concessionaire TPA launched several initiatives to improve environmental impacts. The construction of hermetic storage facilities for minerals, and the pavement of the port zone allowed limiting the risk of contamination. This effort for controlling particle emissions was acknowledged by the Green Award Company in 2010.

In addition, Arica became the first port in Latin America to systematically measure its carbon footprint in 2011, using the Greenhouse Gas Protocol. This allowed for better data on environmental performance, hence setting targets of reduction. Emissions were thereby reduced by 5% between 2011 and 2013. EPA received the first Certificate on Carbon Footprint Measurement in Latin America in 2012.

There is no international or supra-national framework that provides incentives for green port policies in Chile. In North Europe and North America, emission control areas (ECAs) have resulted in a significant decrease of shipping emissions in port-cities. Within the EU, regulations have been introduced so that ships at berths in EU ports use fuels with a maximum sulphur content of 1%. Similar regulations with regards to sulphur content of fuel have been introduced in China. The EU has introduced a regulation that will make it mandatory for EU ports to provide LNG bunkering facilities and/or shore power facilities by 2025.

There is also a remarkable lack of voluntary green policies by ports. Various ports around the world have implemented a plethora of instruments to green their port. Focusing on shipping emissions, ports have developed instruments to mitigate emissions from ships, port terminal equipment and port hinterland transport. These instruments include regulation, incentives, subsidies and infrastructure investments. Several of these instruments have become fairly common among global ports. None of these instruments, however, have been applied in Chilean ports.

This is not only due to the lack of legal norms and obligations with regards to the environment. Although legislation and regulation have evidently stimulated green port policies in various countries, most of the greening of ports policies is driven by motivated port authorities. This is particularly the case for port authorities that must be highly responsive to concerns of the citizens living in urban areas adjacent to ports.

Lack of co-ordination between port and urban planning

Some ports are not ideally connected to the larger transport network in Chile. Freight trucks coming from or going to the port have to pass through the city centre, intermingling with the regular urban traffic, at the same time causing and being subject to urban congestion. In various cases the port gate is simply badly integrated in the part of the city immediately surrounding it, which increases the risk of trucks lining up in front of the gate, leading to undesirable traffic situations in the city.

Zoning next to ports is not always supportive of port industrial development. In various ports in Chile, land use next to the port is dominated by residential development. Considering the fairly limited space for Chilean ports, there is pressure to use land in proximity of the ports for logistics activities or port-industrial use. In some cases, e.g. in San Antonio, this land has been re-zoned, leading in practice to hybrid situations with logistics activities uncomfortably co-existing with remaining residential use. Ports generally have a say in urban planning, but not more than any other company or citizen. Considering that ports are strategic assets for the development of a country and its citizens, its involvement in urban planning should not be like any actor in the city, but more weighty. Cities are in many cases also not naturally involved in the port planning process, even if urban citizens are in some cases extensively consulted (Box 3.6).

Box 3.6. **Stakeholder consultation in San Antonio**

The "Participación Ciudadana Anticipada" initiative was organised by the Port Authority of San Antonio to involve citizens in the port-related decision process. Indeed, the port of San Antonio has undertaken important developments in the last ten years, such as dredging works and this may continue with the Mega-Port project. Consequently, it is in the interest of the Port Authority to ensure co-operative relationships with the city, considering that citizens could block port activities in case of a strong disagreement. Social impact mitigation and smooth consultation processes are thereby important challenges for the port of San Antonio.

Stakeholders' consultations were organised to inform citizens on new projects, their impacts, and the compensation they were entitled to. This was very important for fishermen for example, as the dredging projects had repercussions on their activities. The goal was also to gather information on inhabitants through surveys in the neighborhoods concerned – Barros Luco, Juan Aspee, Brisamar, Las Dunas; these surveys allowed gathering information on the socioeconomic characteristics of the population, their activities and expectations. Meetings were also organised with local authorities, neighbourhoods associations and interests groups (mainly fishermen).

Notes

1 The tax on diesel was established by the law n°18 052 (art. 6), 1986.

2 This study consists of a questionnaire sent to 230 actors; port authorities, concessionaries, regional authorities, municipalities and directors of services related to ports and cities development such as planning, roads, transports, environment, and communities. 113 actors responded, with high disparities: 91% of managers of ports authorities and *secretaria regional ministerial of transportes* responded, while only 11% of regional directors for the System of Environment Evaluation and 0% of the department heads of urban development from the MINVU responded.

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Chapter 4. Policy recommendations

How could changes in Chile's policies improve the performance and impacts of Chilean ports? What can be done in current framework, in which areas would legislative reforms be needed? Which reforms in these areas have worked in other countries and how could Chile learn from some of these examples? These are the questions that are answered in this chapter. The policy recommendations included here are intended to solve the main policy challenges identified in Chapter 3, in order to improve port performance and port impacts (Table 4.1).

Table 4.1. **Main policy recommendations**

Main policy challenges	Main policy recommendations
1. Dual ports system	Formulate a unified ports and logistics strategy
2. Limited performance incentives for pilotage services	Introduce performance incentives for pilotage
3. No structural labour negotiations	Develop a long term joint port labour agreement
4. Very restricted cabotage laws	Liberalise cabotage
5. Lack of a multi-modal strategy	Create a level playing field for all modes
6. Constrained mandate of ports	Modernise port governance
7. Absence of green ports policies	Create a framework for green port policies
8. Poor co-ordination between urban and port policies	Give cities a stake in ports

Source: ITF/OECD elaboration.

Formulate a unified port and logistics strategy

This measure aims at solving the fragmentation of the ports system that leads to lower maritime and port connectivity than would be achieved in a more concentrated port system. The main elements of such a strategy are outlined below and the main recommendations include:

- Establish a national hierarchy of ports, whilst not hampering the private sector's ability to react and invest quickly. Possibly decentralise ports that are not of national interest.
- Develop a national freight strategy for the whole of government, to make ports part of a logistics network.
- Make maritime concessions a joint responsibility of the Ministry of Defence and Ministry of Transport and Telecommunications.
- Forbid continuation of maritime concessions in case the concession is not used; stop the practice of extending these periods.
- Make private ports pay for the infrastructure needed to connect the port with the hinterland. Impose that private ports publish the prices of their services, and make them

non-discriminatory. Consider extending the application of principles for public ports, such as transparency and non-discrimination of port users, to the private port sector.

Establishing a national hierarchy of ports consists of defining ports of "national importance", and ports of regional or local importance. Ports of national importance could be considered the main gateways to the whole country or the ports used by leading exporters, but might also include other elements considering the essential and strategic connectivity of terminals in remote and island regions. Such a port hierarchy should guide the priorities when deciding on public investments in connections between the ports and land transport networks. Determining such a port hierarchy would also help to define what port capacity (public and private) is needed in the coming decades and which ports and port hinterland corridors could accommodate this cargo. For such a hierarchy to be successful all relevant ministries, in particular the Ministry of Transport and Telecommunications, Ministry of Defence and Ministry of Public Works, would need to adhere to it and it would cover the ports system, public and private ports included.

The number of "nationally important ports" should remain relatively low for a national ports hierarchy to make any sense. Examples of port hierarchies in other countries show that the number of ports prioritised in such policies range from three (in Poland) to 44 (in Spain) (Table 4.2). Much of this is context-dependent and might be determined by the length of the coastline, the localisation of the main population centres and regional economic dynamics. Chile is characterised by an extremely long coastline, a considerable concentration of population in central Chile and main exporting sectors clustered in the North (mining), Central South (timber) and spread out over the country in the case of fruits. While the public interest of public ports is clear from the perspective of lower consumer prices, the public interest of certain private ports dedicated to one corporate customer is a priori less clear. This would need justification before such a private port could be considered of national importance.

Table 4.2. **Port hierarchies in national policies**

Country	Port volume 2014 (mln tonnes)	Port hierarchy
Canada	475	19 Canada Port Authorities (CPAs), 26 remote ports; in addition to regional or local ports
France	303	7 ports of national importance (GPMs), in addition to regional or local ports
Greece	170	12 ports of national interest
India	1000	13 major ports, 187 non-major ports
Indonesia		25 strategic ports
Ireland	48	5 ports of national significance (Tier 1 and 2), 14 ports of regional significance
Italy	443	23 ports of national importance; in addition to ports of regional relevance, military ports
Korea		28 international trading ports, 23 coastal (local) ports, 9 new ports
Poland	69	3 ports of national importance
Portugal	80	5 main seaports, 4 secondary ports
Spain	428	44 ports of general interest, ports of non-general interest

Source: Merk (forthcoming, 2016).

The establishment of a port hierarchy could be coupled to ongoing decentralisation reforms. The responsibility for ports of regional or local importance could be decentralised to a sub-national government tier. This is fairly common in OECD countries and such decentralisation reforms have recently been undertaken by France and Canada. Although regional or local government responsibility for ports has not been widely considered in Chile, the ongoing government discussion on decentralisation in Chile might provide openings in this respect. If a reform of the regional government level were to take place, the regional government might be assigned the responsibility of the ports of regional and local importance, more or less similar to decentralisation reforms in France (Box 4.1). This could have mixed effects on the fragmentation of the ports system. If the regional government would manage to develop a strong grip on all the ports in the region, this could improve co-ordination between the ports in the region. At the same time, the coherence of a national system is difficult to maintain if regional governments start to develop ambitious schemes for their ports that could potentially affect other ports. So, if the responsibility for certain ports were to be decentralised, it would be important to tie the relevant regions to the national ports strategy.

Box 4.1. **Port hierarchy and decentralization in France**

Historically a very centralised country, France has been decentralising over the last three decades. In 1983 the management of small leisure ports was transferred to local governments. A second decentralisation reform, in 2004, went further and transferred the full property of 17 important commercial ports, formally considered of "national interest" to sub-national governments as of January 2007. The motivations behind such a transfer was the application of the principles of proximity – making of public policies closer to the local level, and subsidiarity – based on the idea that most appropriate government level for any task is the most decentralised level provided it can still be effective. For the central State, it was also a way to transfer a financial liability (Debrie and Lavaud-Letilleul, 2004). Today, the French port system is composed of seven national "big maritime ports" (+ 5 in overseas departments), and more than 500 other ports, mostly leisure ports, controlled by the sub-national government level.

During the property transfer process, difficulties came up linked to the competition between local entities to get port responsibilities. Any sub-national government could submit a proposal to acquire competences over ports. In the case of multiple candidatures for a port, the State representative in each part of the country, the prefect, had to organize a consultation to find a compromise under a multi-partner solution. In many cases, different sub-national government tiers are jointly in charge of the ports in their region.

The design of a national port policy should not prevent the private sector's ability to act and invest quickly. Port-related projects carried out by the private sector could be integrated in the national plan, in order to better anticipate their actions. The Port of Mejillones is an example of a successful mix between public planning and action of the private sector (Box 4.2).

Design and implementation of a coherent national freight strategy could help to consider ports as links in a logistics network. It could also help optimise existing resources and concentrate efforts on the most strategic projects and corridors. This is specifically important in the Mega-Port project (PGE), which will require coherent investments in hinterland transportation to be successful. A number of countries have understood that co-ordinating infrastructure, regulation and services requires efforts at the national level and could enable to develop a more efficient and better integrated transport system to support the national economy and boost international trade. This is why some have decided to develop, design and implement a national freight logistics strategy. The drivers and objectives vary from one case to the other, as well as the way they are structured.

A national freight strategy for Chile should help to align the policies of the many different stakeholders in the field. This strategy should be developed in the context of large macro-regions, co-ordinated between different administrations and with value added for the actors in supply chains. In most cases, the design of a freight strategy involves consultation of a large variety of stakeholders, such as several relevant ministries, state agencies, the private sector and experts from academia and other fields. Implementation is in most of the cases either organised through separating the tasks between relevant institutions by concern or topic, or by government tier (Table 4.3). The exception is that Canada defined actual corridors placed at the core of the strategy and concentrating all the development efforts, which proved to be a successful approach (Box 4.3). Other countries such as the United States and Australia are currently in the development phase of their own national logistic strategies.

Box 4.2. **The Port of Mejillones**

In 1995, the port of Antofagasta was damaged by a seism. The copper companies of the region realised it was crucial to have an alternative port to ensure the continuity of their exports. It was also an opportunity to move mining export activities away from Antofagasta, as tensions linked to lead contamination and congestion issues were rising.

The project of the Port of Mejillones was a mix between public and private action. The 100% state-owned mining company Codelco created the filial Complejo Portuario Mejillones S.A. (CPM) as a limited company and obtained a maritime concession in Mejillones. In parallel, the Plan Regulador of the city of Mejillones reserved a large area for port expansion in its zoning. Then, CPM granted a concession to Compania Portuaria Mejiollnes (Ultramar) to build and operate the port. The State financed road accesses, dredging and administrative buildings –as it is the case for most ports of public use. In addition, the MOP prioritised the pavement of roads connecting the Antofagasta region, and more specifically Mejillones, with the Jujuy region in Argentina. This was part if of the bi-oceanic corridors project.

Mejillones has a unique status. It is owned by Codelco Chile, and the President of Chile asked Codelco to run the port. However, it is not properly public as it had to go through a maritime concession for its opening. In addition, Codelco acts both in close co-operation with the public sector, and as the owner of a private port. Consequently, the port of Mejillones benefits from both an integration in public planning – hence good hinterland infrastructure and the reactivity of the private sector.

Source: Own ITF/OECD elaboration.

Maritime concessions could become a joint responsibility of the Ministry of Defence and Ministry of Transport and Telecommunications. In this way, the development of private ports can be closely aligned to the national ports and logistics strategy. In practice this would mean that the ministries decide jointly on criteria, timelines, procedures for maritime concessions, as well as the granting of the maritime concessions. This joint decision-making could take several forms, either within a national logistics authority as proposed by the 2030 Logistics Committee, or a joint ministerial committee. This would align Chile with practices in other countries that have a significant share of private ports, where the responsibility for granting concessions to private ports is in the same hands as concessions for private terminals in public ports. Chile seems to be a rare example where the granting of concessions for private ports is dissociated from the Ministry in charge of the public port system (Table 4.4). Such a reform could be implemented in the short term as a new working practice, but would require change in legislation to formalise it.

Table 4.3. **Overview of National Logistics Plans in selected countries**

Plan	Led by	Stakeholders involved	Modes
Canada's Policy Framework for Strategic Gateways and Trade Corridors (2007)	Transport Ministry	Public sector, industry	Maritime, Rail, Road, Air
Germany's National Freight Transport and Logistics Masterplan (2008)	Transport Ministry	Industry, academia, associations, unions	Maritime, Rail, Road, Air
Indonesia's Blueprint of National Logistics System Development (2012)	Presidency	Public sector, industry, academia	Maritime, Rail, Road
South Africa's National Freight Logistics Strategy (2005)	Transport Ministry	Public sector, state-owned enterprises, industry	Maritime, Rail, Road, Air
Korea's National Logistics Plan (2011)	Transport Ministry	Government agencies, logistics industry	Maritime, Rail, Road, Air

Box 4.3. **Canada's national intermodal freight strategy: The Gateways and Corridors approach**

In response to trade evolutions and their impact on the country's transportation system the Government of Canada initiated and released a National Policy Framework for Strategic Gateways and Trade Corridors mid-2007. This framework was developed by Transport Canada to improve the capacity and efficiency of the country's transportation network to support external and internal trade, and secure the competitiveness of the economy. The framework aims at fostering development and optimisation of transportation infrastructure, operations, technology, regulation and policies for all modes (marine, road, rail, and air) that support freight and passenger flows of national significance.

In order to strengthen and keep building a strong national transportation network, the Canadian Government identified three Gateways and Trade Corridors based on the most strategic routes within the country. From 2007 Asia-Pacific Gateway and Corridor (APGCI) focuses on creating the best possible link between Asia and North America. The Ontario-Quebec Continental Gateway is mostly dedicated to facilitating domestic and Canada-US trade with a focus on border crossings. The Atlantic Gateway and Trade Corridor initiative connects the country with major East Coast deep-water ports to tie it with the European market and Latin American, Caribbean and Asian markets through the Suez Canal since 2011.

Based on the National Policy Framework and the establishment of the three corridors, large infrastructure investments have taken place. Up to now around CAD 6 billion coming from a large number of public and private sources have been injected in the projects. On its own, the APGCI has generated 47 projects worth CAD 3.5 billion in total. Several funds have been created in support of special initiatives such as the Gateways and Border Crossings Fund (CAD 2.1 billion) and the Asia-Pacific Gateway Corridor Initiative (CAD 1 billion) that are included in the budget of the national overall infrastructure development plan, Building Canada. These large infrastructure investments are not the only improvements that have been brought to the state of logistics in Canada.

Within the strategy, the government identified the importance of creating inland logistics platforms. One major project is the CenterPort Canada; it encompasses 20 000 acres dry-port located between Winnipeg and

Rosser, next to the Winnipeg J.A. Richardson International Airport. Building on Winnipeg's central location on east-west and north-south trade corridors, the project aims to build a multimodal logistics hub for manufacturing, distribution, warehousing and transportation.

In parallel, regulatory, financial and policy impediments were reduced. Some examples of these improvements include modifications of tariff regulations facilitating the use of imported containers, the cancellation of a 25% charge on certain foreign built ships, the creation of "Tariff-free Zones" for manufacturers, free trade zones with special tax programs and policy packages accessible from everywhere in the country, regional port regrouping under Port Metro Vancouver in the lower part of British Columbia or the development of free trade agreements with Europe and India.

The Canadian Government identifies the constant information sharing between a large range of private and public stakeholders as one of the keys to the success of the Gateways and Corridors Strategy. Despite the creation of a national framework, effective implementation of the plan and project development is largely due to the local take that each gateway enables and provides. This is also what enabled the program to generate benefits at the national, regional and local levels and to produce positive ripple effects between improvements in one supply chain and another. Transport Canada is also engaging in considerable efforts to develop comprehensive performance monitoring and assessment tools to measure the results of the Gateways Initiative.

Maritime concessions should not be allowed to be extended in case the concession is not used. The current practice amounts to hindering competitors to enter the market, whilst blocking scarce coastlines and bays for more productive use. Prohibiting extension of not-used concessions should be included in the relevant legislation, so might require changes in the DFL 340.

Table 4.4. **Ministries in charge of private ports and public ports**

	Who grants concessions for private ports?	Who grants concessions for private terminals in public ports?	Who is in charge of the public port system?
Chile	Ministry of Defence	Public Port Authorities	Ministry of Transport and Telecommunications
Australia	State governments	Public Port Authorities	Transport Department of State governments
Canada	Transport Canada	Public Port Authorities	Transport Canada
Brazil	National Agency for Waterway Transportation (ANTAC) and Secretariat for Ports (SEP)	ANTAC and SEP	Secretariat for Ports
Mexico	Ministry of Transport (SCT)	Ministry of Transport (SCT)	Ministry of Transport (SCT)
Philippines	Philippine Ports Authority (PPA)	Philippine Ports Authority (PPA)	Philippine Ports Authority (PPA)

Note: Transport Canada is the Canadian federal Ministry of Transport. The Brazilian Secretariat of Ports is an agency of the Brazilian Presidency. ANTAC stands for National Agency for Waterway Transportation, part of the Brazilian Ministry of Transport. Philippine Ports Authority (PPA) is an agency of the Philippine Department of Transportation and Communication.
Source: Own elaboration.

Private ports should pay for the infrastructure needed to connect the port with the hinterland. This means that they would cover costs for connecting the port with the road and railway network, as well as the additional costs that customs and other inspectorates would make due to the emergence of the new private port. Private ports paying for connecting infrastructure is common in other countries; e.g. DP World, the private terminal operator that set up the London Gateway Port, contributed to financing road widening of the A13 motorway, one of the two access a roads to the new port. To create a level playing field between public and private ports, the rates and charges for the use of private port services should be published and applied on a non-discriminatory basis. In addition, it could be considered to extend the application of all the principles for public ports, such as transparency and non-discrimination between port users, also to the private ports sector.

Introduce performance incentives for pilotage

This measure aims at solving the limited performance incentives for pilotage services. The main elements of such a strategy are outlined below and the main recommendations include:

- Provide incentives to pilots in order to improve performance and reduce inefficiencies.
- Define objective criteria for port closures.
- Consider introducing competition in the field of pilotage

Pilots should have more incentives for good performance. This could be implemented both at the individual and collective level. Highly performing pilots could receive a performance-related bonus, e.g. along the lines of the Singapore Pilotage Incentive Award for Marine Pilots, rewarding professional service, technical expertise and customer satisfaction (Box 4.4). At the collective level, incentives could be introduced that improve the efficiency of pilotage services and stimulate shorter ship waiting times. This could take the form of more structured planning of pilotage services, in the form of a pilotage appointment system, so that ships know in advance when they would need to arrive. Such a scheme would give priorities to shipping companies who gave sufficient advance notice of the arrival of their ship and respected this time window. Such a scheme should ideally be designed in co-operation between the Maritime Authority and shipping companies, so that there is an agreement on the fairness and applicability of the scheme.

Box 4.4. **Singapore's Pilot Incentive Programme**

In 1998, the Singapore's Maritime and Port Authority (MPA) created a Pilotage Incentive Award for Marine Pilots, designed to encourage greater efficiency in pilotage operations. The best pilots receive USD 2 000 and a certificate of excellence. Performance is assessed on four main criteria: presentation, professionalism, technical expertise and customer satisfaction. Presentation was assessed by the general appearance of the pilot, the ability to communicate effectively and the willingness to give information and assistance. Professionalism was defined as the ability to carry out pilotage duties to the high standard expected of the best in the profession and the ability to make sound and timely decisions in handling all situations. Technical expertise included local knowledge of the environment and the ability to assimilate the vessel's manoeuvring capabilities and apply them to the prevailing conditions. Finally, customer satisfaction was meant to cover the ability to inspire confidence in the ship master, a good rapport with the bridge team and punctuality in boarding of vessels. Between 1998 and 2005 the number of piloting incidents decreased by over 76%, from 21 to five (MPA, 2016).

Objective criteria for port closures should be established and communicated to shipping companies. This could take away the perception of unpredictability and divergent approaches on port closures. As part of this procedure of clarifying the criteria for port closures, port manoeuvrability

studies should be updated. In this context, the creation of a permanent committee could be considered to establish uniform criteria for port closures and set binding conditions to determine specifications in the field of pilotage.

Introducing competition in the field of pilotage should be considered. The aim of this would be to improve pilotage services in Chile. This is particularly important considering the specific and rather exceptional context in Chile where the hierarchical military relationships seem to dominate functional relations between pilots and harbour masters. Some stakeholders suggest that harbour masters tend to be sensitive to proposals from pilots, rather than the other way around, as happens in most OECD countries. Competition in pilotage is fairly rare among OECD countries, as it is associated with concerns about safety and as existing practices in many cases result in satisfactory results. However, these countries do not have the unique and specific context of Chile which could cause sub-optimal pilotage services. Competition in pilotage services could also be introduced gradually, along the lines of the Danish pilotage reform; that allowed private pilots to conduct regional pilotage (i.e. pilotage commencing or ending at a Danish port). Non-regional pilotage of ships passing through Danish waters, however, was still reserved for the state-owned pilotage company. Competition could also be on a market level: a regular tender for pilotage services would expire after a few years, thus making providers of pilotage services replaceable in case of inefficiencies or deficient service levels.

Develop a long-term joint port labour agreement

This measure aims at solving the lack of structural labour negotiations. The main elements of such a strategy are outlined below and the main recommendations include:

- Optimise the labour legislation for dockworkers, with a view of convergence towards the general labour regime in Chile and stimulating permanent employment.
- Improve basic worker conditions.
- Develop a more consensual culture of negotiations.

The move towards more permanent port jobs should be stimulated. This status brings more stability and better working conditions, as explained in Chapter 3. Several ports, such as San Antonio and Valparaiso, have implemented such policies that could be rolled out to other ports in Chile. Such a measure could help to break out of the spiral of continuous negotiations and strikes. This should allow for a long period of labour stability and increase the attractiveness of Chilean ports. Optimising the labour legislation for dockworkers should address and improve worker conditions, such as maximum working hours and health insurance, building on the measures Chile already put in place.

A more consensual structural negotiation process should be developed, which allows for regular exchange between employers, employees and possibly government. Public ports and private terminal operators should involve port workers representatives in their strategic decision making. Such structural negotiation is already possible under the current law n°20 733, 2014, but so far hardly implemented.

Liberalise cabotage

This measure aims at solving the very restricted cabotage laws. The main elements of such a strategy are outlined below and the main recommendations include:

- Implement exemptions in case of port closures.
- Cancel the fiscal punishment for foreign firms that would like to bid for a waiver.

- Open up exemptions for certain cargo types. Promote pilot programmes, to see if there is a market and what are the impacts of liberalisation.
- Open up cabotage for a selected number of main ports, while ensuring the connectivity of remote regions.
- Start a discussion within the Pacific Alliance on a supra-national cabotage policy.

Table 4.5. **Examples of cabotage reforms**

Country	New legislation	Main reforms	Driver of change
Australia	Coastal Trading (Revitalising Australian Shipping) Act (2013)	Foreign flagged vessels engaged in cabotage under a temporary license do not have to engage Australian seafarers but must respect Australian labour requirements (wages). Accompanied by tonnage tax.	Revitalise the Australian fleet and give preference to Australian labour.
China	The Pilot Free Trade Zone in Shanghai (2013) + Plans of Chinese State Council (2015) to open cabotage in five other ports	Foreign-flagged vessels can engage in cabotage between Shanghai and other domestic ports, as well as between five designated ports and domestic ports. The flag restriction is cancelled but ownership restrictions remain.	Develop Shanghai as a transhipment hub.
European Union	Council Regulation n°3577/92 (1992)	Cabotage is liberalised within the EU: ships engaged in EU cabotage must be EU-registered and EU-flagged. They must comply with all conditions for carrying out cabotage in the host country. For island cabotage, vessels must respect the manning requirements of the host country.	Deepen the common market.
New Zealand	Section 198 of the Maritime Transport Act (1994) + related provisions of the NZ Ship Registration Act	Removed the restrictions for coastal shipping: there is no flag/ownership/construction/crew requirements anymore. However foreign ships cannot operate continuously on the NZ coast. A foreign ship passing through the NZ waters on a journey between two foreign ports is allowed to stop in NZ to load or unload international cargo/passengers.	Increase competition, improve the quality of services and lower prices of domestic carriage. This reform was part of a liberalisation wave in many sectors.
Philippines	Foreign Ships Co-Loading Act (2015)	This act cancels the need to have a Certificate of Philippines Registry to engage in cabotage. Hence, there is no ownership/flag and crewing requirement anymore.	Poor performances of the maritime industry and implementation of the ASEAN Economic Community.

Source: ITF/OECD elaboration.

An uncontroversial option seems to allow for exemptions in case of port closures. Shipping lines currently have to use domestic coastal shipping when their cargo cannot be delivered to the original

destination in case of port closure, e.g. due to bad weather. This incurs additional costs, whereas they could use their regular services to bring back the container to where it should have been originally. This would imply that the Maritime Authority allows for coastal shipping by foreign companies in case the destination port (e.g. Iquique) was closed and the container had to be deviated to another port (e.g. Antofagasta), but would need to go to its planned destination (Iquique) nevertheless.

Cabotage could be opened up in the short term by facilitating the system of waivers and create incentives for foreign ships to participate in bids. In many countries, waivers and exemptions have been the way to stimulate coastal shipping (Table 4.5). In Australia 677 temporary licenses were granted in the two years following the Coastal Trading Act (Annex 3). Waivers in Chile are highly unattractive to foreign shipping companies as they are associated to substantial fiscal payment. The waiver system could be made more attractive by cancelling the fiscal punishment for foreign firms bidding for a waiver. This would require changing the relevant decrees, such as the *Ley sobre inpuesto a la renta* (DL 824, 1974, art. 59, no. 5).

Another approach could be to open up exemptions for certain ship types, so as to phase in the liberalisation of cabotage. This could be done in sectors with untapped potential for using coastal shipping. Such an approach could possibly be linked to pilot programmes stimulating coastal shipping, that could be supported by the Ministry of Transport and Telecommunications. Such programmes might, in partnership with certain industries, explore alternative supply chain options that include coastal shipping rather than truck transport. An example is the supply chain of fruit exports, now highly truck dependent, which could benefit from a more attractive supply of coastal shipping options, including from foreign companies.

Box 4.5. **The Chinese middle way: Opening without reforming**

The Chinese cabotage monopoly slightly opened in 2013, with the implementation of the Shanghai Pilot Free Trade Zone. This measure was initiated by the Shanghai Municipal Transport Commission and approve of by the government. It applies to the Tangshan offshore deepwater container port, landside space associated with Yangshan, Pudong International Airport, and the Waigaoqiao logistics area. As a result of this legislation, foreign-flagged vessels are now allowed to operate in cabotage between Shanghai and other domestic ports – provided that the owner of the vessel is Chinese. Foreign carriers, especially Maersk, were pushing for such an opening while COSCO and China Shipping opposed it. However, these domestic lines retain advantages, because (as of January 2014) China has not indicated it will allow foreign operators to carry domestic cargo; hence the opening would mainly allow foreign carriers to do transhipment in China. The main ports that would suffer from this new legislation would be the transhipment hubs of the region, namely Hong Kong and Busan (OECD, 2014). In 2015, five other ports got the permission to receive foreign-flagged vessels engaged in short-sea shipping (Tianjin, Jiangyin, Haicang, West Shenzen, and Nansha).

Chile could consider a partial opening of coastal shipping between a selected number of ports in the country. In this way, a fairly limited number of important routes would be subject to foreign competition, while leaving cabotage between the majority of Chilean ports to domestic shipping companies. This partial opening could be linked to the conception of a unified national ports strategy, as ports of national importance could be allowed to receive foreign vessels participating in cabotage. Coastal shipping between ports of local importance would be reserved for national-flagged vessel. Such a measure was recently introduced in China (Box 4.5) and could be considered a gradual way to reform cabotage. It would allow liberalising coastal shipping where it is efficient for trade, while ensuring that remote areas still benefit from transportation services. For example, the State could

mainting the role for maritime liaisons between regions such as the Juan Fernandez archipelago and Easter Island, and the rest of Chile.

Box 4.6. **The European Union: Liberalising cabotage at the supranational scale**

In 1993, the EU liberalised coastal shipping for member states. The regulation allows providing maritime transport services within a Member State for Community ship-owners operating ships registered in an EU State and flying the flag of one of these States. Vessels must comply with all cabotage conditions in the host country, especially with the manning requirement for island cabotage. This reform was part of the regional integration process; aiming at completing the common market, and establishing a common maritime policy. It had to deal with different backgrounds on coastal shipping; Southern European countries like France, Italy, Spain and Greece were more protectionists, while Northern Europe and mainly the UK had a more open vision of cabotage. This is linked to countries having different needs for costal shipping, with the south being more dependent on cabotage for mainland/islands passenger transport than the north.

Consequently, reluctance to a liberalisation of short-sea shipping mainly came from Mediterranean seafarers. However, the EU was able to overcome it, thanks to a gradual and consensual process; first, a legislative package opened the way to a common maritime policy in 1986. In 1992, the council regulation tackled the issue of cabotage and set a gradual phasing of the timetable for coastal shipping liberalisation, acknowledging the differences between the north and the south of Europe. Southern countries had until 1999 to open up their regular coastal passenger services, and Greece had until 2004. In addition, the process was flexible enough to adapt to certain demands of opponents; for example, one issue was that Mediterranean seafarers feared that the change from host-State to flag-State manning conditions on ships engaged in coastal shipping would distort the market. This was linked with the possible entrance of northern ship-owners, hiring low-paid foreign crew, hence jeopardising European seafarers' employment. The Commission hear this concern and a compromise was found; in the case of regular passenger services (island cabotage), all matters related to manning are the responsibility of the State in which the vessel is performing transport services.

Cabotage could also be opened up within the framework of the Pacific Alliance. The member countries of the Pacific Alliance - Chile, Peru, Colombia and Mexico - are located on the coastline and might have a common interest in liberalising coastal shipping so as to increase trade between the Alliance countries, which is currently fairly limited. Chilean domestic shipping companies might be able to benefit from a coastal shipping market at the Pacific coast of Latin America. An example of a supra-national cabotage reform is provided by the European Union (Box 4.6). This example is all the more relevant since it is similar to the Chilean case and the connectivity issue with its remote regions; in the EU special status have been granted to cabotage between the mainland and islands in Greece for example, to ensure a smooth transition for passenger's services.

Create a level playing field for all hinterland transport modes

This measure aims at solving the lack of a multi-modal strategy. The main elements of such a strategy are outlined below and the main recommendations include:

- Formulate an ambitious action plan to increase rail freight.
- Phase out subsidies to truck transport.
- Roll out incentive programmes to improve smooth cargo flows to and from the port gate.
- Provide incentives for trucks to come at off-peak hours.

An ambitious action plan would be needed to increase rail freight. Such an action plan would include developing main corridors and investing to solve bottlenecks. A special freight unit within or

outside EFE would need to be established, with an entrepreneurial mandate, strong backing by EFE management and pro-active staff with affinity with cargo transport and logistics. The ways and conditions under which the use of private rail freight networks by third parties might be increased should be explored. These conditions could include establishing logistics centres to consolidate cargo, public subsidies and stronger oversight on access conditions on private railway networks. Cross-subsidies to trucking should be phased out. By means of providing a stimulus to freight rail transport, a reduction of port tariffs could be considered for all containers that are transported by rail provided that such a tariff reduction is available to all port users, in line with similar measures in Spain. Since 2004, Spanish ports have been required to give a 20% discount on port dues if a container goes by rail.

Phasing out subsidies to truck transport would level the playing field with regards to port hinterland transport modes. This would mean phasing out the tax credits for trucking companies. A way to do this, while increasing the environmental performance of port trucks, could be to link the tax credit to the condition of environmental performance and a requirement to retire old trucks. Such truck retirement programmes have been highly successful in reducing emissions from trucks in the port area and surroundings in the west coast ports of North America. Similar schemes are implemented in Hong Kong, who launched a programme to incentivise the replacement of the dirtiest trucks on the roads.[1] Transforming the tax credit into a green truck credit could be a first step in phasing out the tax expenditure for trucking companies. Another measure to increase the level playing field would be to bring the tolls for trucks in line with the damage they cause and the related need for maintenance. This would imply increasing the truck/car ratio in toll prices. This could be most easily implemented in new concessions for highways, but renegotiation of the existing highway concessions could also be considered.

Box 4.7. **Los Angeles' PierPASS**

The most well-known example of extended gate hours is the PierPASS programme implemented in the ports of Los Angeles and Long Beach, which includes a Traffic Mitigation Fee (TMF) for drayage transactions made during peak hours, with exemptions for off-peak hours. The TMF fee is USD 50 during peak hours (originally USD 40), with exemptions during off-peak hours and for empty containers and intermodal transport using the Alameda corridor. The Beneficial Cargo Owners (shippers, consignees, or their agents) are responsible for the payment of the fee. Neither the trucking community nor the ocean carriers is assessed a fee under this program. In addition to providing an incentive for the shippers to divert cargo to off-peak time periods, the TMF also serves to defray the additional costs incurred by the terminal operators to keep terminal gates open at night and on weekends.

The PierPASS programme was successful in reducing daytime truck arrivals from 90% to 66% within a few months of being introduced (Cambridge Systematics, 2009), and it reduced daytime traffic on a nearby freeway by 13%. The average share of off-peak cargo from July 2005 to September 2006 was 40%, with an average rate of increase of about 8% per week. Little sensitivity to the fee itself was found, which suggests that adjustment costs, such as additional opening hours and more storage space for cargo, are the key factor in cargo scheduling (Giuliano and O'Brien, 2008). The programme was also positively perceived: drayage operators felt that extended operating hours of terminal gates had a positive impact on the overall efficiency of drayage operations, according to a survey (cited in Cao and Karafa, 2013). The only drawback of the programme was that ports experienced heavy queues just before the opening of the off-peak hours, due to a flaw in the design of the programme; a variable pricing scheme would alleviate this side effect.

Source: OECD (2014).

Incentive programmes to improve smooth cargo flows should be implemented throughout Chile. There are a number of ways in which ports and other port actors can enhance service quality and reliability at ports and throughout the whole logistics system. Incentives or disincentives can be given at different levels of port operations so that service providers engage in facilitating cargo movements from the sea to the port's gate. Several ports in Chile have already started to design and implement variants of such programs, e.g. in San Vicente, San Antonio and Valparaiso, as mentioned in Chapter 4. These good practices should be rolled out in other Chilean ports as well, designed in consultation with the actors concerned, based on local context and behaviours in order to maximise their effectiveness.

Box 4.8. **Port of Gothenburg: Working for national exports**

Gothenburg is the gateway to Sweden and other parts of Scandinavia. By far the largest port in the country, it was responsible for handling 65% of Sweden's container traffic in 2015. It constitutes a critical asset for the Gothenburg region and Sweden's economy as a whole, considering the relatively high share of maritime transport costs in the goods value of Sweden's main export products. Conscious of this responsibility the port works to provide the best possible services it can to shipping lines and exporters as well as the Swedish industries. But it is also highly concerned about its impact on the city's environment and people which leads it to get involved in a number of initiatives to maximise its benefits and mitigate its negative externalities. The key driver of the port is achieving long term business growth while ensuring economic, environmental and social sustainability of its activities.

The port considers that the best possible service quality has to be done in such a way that it minimises the negative impact port activities can have on the environment and make sure it is beneficial to locals. On the environmental side, the Port of Gothenburg has been investing in a large number of initiatives to green its operations, for which it has received international recognition. This is also a way for the port to align with the city's development plan in which the preservation of the environment is a key driver. To reduce air emissions from ships, Gothenburg was one of the first ports to invest in on-shore power facilities so that vessels can connect to the local energy network and shut off their engines while at berth. The service has been proposed for Ro-Ro vessels since 2000, and is very widely applied with traffic share coverage of terminals with shore power of 100%. The port also applies differential tariffs for ships that use cleaner fuels, which is easier and less costly to implement. It is working on developing a LNG (Liquefied Natural Gas) Terminal and, alongside the Port of Rotterdam, pushes for a wider adoption of this alternative fuel in Europe. Other than air emissions, it focuses on the mitigation of oil spill risks. As part of its "Green Bunkering" project, it introduced set of rules in 1999 that encompasses a wide range of activities for effective monitoring, prevention and reaction to risks. It has also advocated for the wider adoption of such measures in the rest of Sweden, contributing the passing of a bill in 2011 imposing the frequent control of pressure in bunkers (ITF/OECD, forthcoming). The preservation of flora and fauna around the port is another key concern of the Port of Gothenburg, which led a number of projects such as the recreation of reefs to compensate successive fairway deepening works that threatened the natural habitat of various marine species. Other than environmental efforts, the Port is involved directly with the city government on urban planning and other matters, such as on issues concerning ferry and cruise terminals, which are meant to also be places for use and enjoyment by locals. It has commissioned a study on the economic impact of the port and collaborates regularly with local universities both to integrate and train students, as well as to exchange experience and knowledge on logistics and maritime industries.

Chilean ports could also attempt to create incentives for port trucks to come at off-peak hours, as ship size goes up and with it the amount of cargo to handle at one particular moment (peaks). Considering the relatively small terminal yards of Chilean ports, the only way to handle such peaks would be to get cargo out of the yards as quickly as possible. This will increase the pressure on the port stakeholders to be able to work 24 hours a day and seven days a week, when needed, so as to smooth cargo over the entire day. This would be facilitated by extended gate hours and incentives for

trucks to come at off-peak hours, to redistribute the arrival times of trucks in the port along the day. Such an ambition was successfully implemented in the port of Los Angeles with the PierPASS Programme (Box 4.7). In relation to this, it could be considered to extend the use of truck holding areas that could be used to regulate the flows of trucks to the terminal gate, in order to avoid congestion.

Modernise port governance

This measure aims at solving the constrained mandate of ports. The main elements of such a strategy are outlined below and the main recommendations include:

- Extend the mandate of port authorities, both spatially and in terms of authority.
- Provide port authorities with more instruments.
- Conduct an annual study on the economic impacts of ports in Chile.
- Stimulate concession design that promotes wider societal gains.

The mandate of port authorities should be extended, both spatially beyond the boundaries of the port areas, and in terms of authority, with greater powers given to management and co-ordination, as well as the resources to exercise these. The current mandate to administer, exploit, develop and conserve ports, should be expanded so as to include the provision of smooth and efficient transport options to importers and exporters, to drive regional economic development and to do so with minimal impact on the environment and urban population. These elements are increasingly seen as essential to port authorities, many of which are moving beyond their traditional landlord roles into more entrepreneurial and community-related roles; a fine example is the port of Gothenburg (Box 4.8). This shift is in line with the mandates described in the OECD Guidelines for State-Owned Enterprises.[2] Broadening of the mandate of port authorities would mean an amendment of Article 4 of the law n°19 542.

Such an enlarged mandate should be translated into operational objectives for port managers. Their objectives are currently related to financial and operational performance within the port. If the mandate of the port authority would be enlarged, this would evidently also need to be expressed in the assignments of port managers. Throughout the process of broadening the mandate, it would make sense that port managers be assessed on a wider set of indicators, such as port gate waiting times, economic and environmental impacts, as far as these are under control or influence of the port authority. It would be essential that the personal liability of port managers be cancelled, in order to stimulate risk-taking and innovations. This would require adaptation of Article 7 of the law n°19 542.

This larger mandate would benefit from more information. This would include information on performance of the logistics chain, as stressed in ITF's earlier work on Logistics Observatories (ITF/OECD, 2016), but also on port impacts, including local economic value added and jobs. In this respect, a yearly study on the economic impact of ports in Chile, both public and private, should be conducted. This would help to clarify the economic impacts of ports in Chile and assess the development of port-related value added and employment. Several countries assess the economic impact of their ports on an annual basis. One of leading examples is Belgium (Box 4.9).

Port authorities should be provided with more instruments. First of all, they should be granted more financial autonomy and allowed to keep a larger share of their net revenues if these are re-invested in port-related projects; this might provide ports with more incentives to increase their attractiveness and thus their revenue potential. It should be made easier for ports to invest in areas that are outside the port area, for example in dry ports or hinterland transport solutions. This means that the requirements that port extensions should take place adjacent to the existing port, and that dry ports can

only be established in the same municipality, should be cancelled. Ports should also have larger freedom to determine the number of staff needed to fulfil their responsibility as supply chain network manager. In addition, ports should be able to create subsidiaries that could engage in dry port development or other activities that would diversify their portfolio, in a similar vein as the port of Barcelona (Box 4.10).

Box 4.9. **Economic importance of Belgian port studies**

In Belgium, the government acknowledges the importance of the country's ports as major actors of both their regional and national economy. It produces information on ports' economic impacts that are measured in annual studies of the Microeconomic Analysis Unit of the National Bank of Belgium (NBB). Data has been gathered to feed the reports since 2001 and the first publication dates from 2008, with 2006 as a focus year. Updates are released every year, highlighting the direct and indirect effects of each port individually and then the aggregate at the country's scale.

In order to produce these figures, the analysis uses the Belgian NACE-BEL 2008 code, the reference frame for statistical data production related to economic activity in Belgium, based on the European NACE (Statistical classification of economic activities in the European Community), itself a derived from the CITI, the United Nations' broader classification. Based on the classification, companies are selected and put in the different categories. They might be different from one port to another given that some activities might not be represented in every port (which is detailed in a chart at the end of each report). Following introductions on methodology and key market trends, the economic impact of each port is presented separately.

Each port's economic weight is explained through four categories: its developments and traffic, its value added, the employment it generated and the investments it is responsible for, each of which is presented per sector (from the maritime cluster to supporting industries and related transportation). For each port, this method makes it possible to highlight the largest companies in terms of value added, employment and investments around each port. Then an analysis of the economic impact of the Belgian port system as a whole is undertaken considering and aggregating the findings for each port and adding two layers: the social balance sheet of the port system and its financial conjuncture. These two layers are put into perspective with traffic figures and demographic trends. The social balance sheet encompasses several dimensions: working time, labour costs, workforce composition, level of external staff use, turnover and training.

The financial state of the port sector is weighted based on three ratios: the return on equity after tax, the level of liquidity and the level of solvency. The reports also take into account the overall financial health of the system through a failure prediction model. Data to evaluate the direct economic impact of ports comes from Central Balance Sheet Office of Belgium, whose role is to collect, handle and make available to the public the annual accounts of all legal entities in the country. This data is also used for calculating financial rations and social impact assessment. The data used for the calculations of indirect effects is gathered by the Institute for National Accounts (jointly managed by Statistics Belgium, the National Bank of Belgium and the National Planning Bureau), the co-ordinating body in charge of putting together major macroeconomic statistics such as the national regional accounts as well as internal and external trade data.

Sources: NBB (2015; 2012; 2008).

The increased societal mandate of ports should also be translated into their concessions with private terminal operators. Bidding and granting criteria for new concessions could include a wider set of indicators, including emissions reductions, modal shifts of hinterland transport and energy efficiency, along the lines of the procedures of the Maasvlakte 2 in the port of Rotterdam (De Langen et al., 2012). Such criteria are not included in the current concession contracts, so have no priority for the terminal operator. Terminal operators that already have concession contracts could be given the

freedom to develop activities to smooth supply chains, similar to other countries. APM Terminals at the Port of Callao in Peru is planning to use available government land to build a truck holding area in order to relieve the port gate and to protect truckers from assaults and robberies. Hutchison has developed an inland terminal close to Mexico City so as to consolidate and de-consolidate port cargo, coming from or going to their various container port terminals in Mexico. The development of such activities currently does not take place in Chile because their activities are linked to the specific location in the concession contracts, which means they cannot invest outside the terminal area.

Box 4.10. **Port de Barcelona's tmZ inland terminal**

The Terminal Marítima de Zaragoza (tmZ) is an initiative that was led by the Port of Barcelona and Mercazaragoza, the largest food logistics platform in the Elbro Valley, gathering over 140 companies. Mercazaragoza owns 56.20% of the shares while APB detains 21.55%, the Regional Government of Aragon 20% through the Corporación Empresarial Pública Aragonesa (DGA) and the remaining 3.45% are owned by other stakeholders. Getting involved in this project is part and parcel of the Port of Barcelona's strategy to extend its activities and services beyond the boundaries of the port to facilitate hinterland connectivity and ensure high service quality as part of its strategic development plan. The Port is building a network of services and infrastructure in strategic locations through investments in various inland goods terminals, among which tmZ. The terminal is strategically located within the Mercazaragoza Logistics Area and at the crossroads of some of the country's main road corridors. Between Barcelona and Madrid, it is situated within a 300-km range of some of Spain's most important industrial areas, including Catalonia, Aragón, Valencia and the Basque region. For the port, this project brings together port services with other maritime logistics services to the largest importers and exporters of the region. Combining tmZ's ability to transfer containers to all these destinations with Barcelona's deep-sea shipping connections offers logistics solutions that are efficient, economical and environmentally sustainable.

The first part of the facilities was opened in 2001 as an inland logistics centre. A direct rail connection between the terminal and the Port of Barcelona was later completed in 2007 to move goods directly from one point to the other. The Port of Barcelona is still contributing to a large chunk of the infrastructure investments and announced it would dedicate EUR 300 000 to the adaptation of the facilities to refrigerated transport. It should also fund the 10 to 12 railway sidings of at least 750 metres in the railway corridor Barcelona-Zaragoza-Madrid. The investments would be done by the port through the Fondo Financiero de Accesibilidad Terrestre Portuaria, an initiative led by the Ministry of Development that plans to dedicate over EUR 450 million to the development of port hinterland development projects throughout the country between 2016 and 2019. The committee in charge of administering the fund is chaired by the representatives of all port authorities. 29 projects have been approved, most of them focusing on last mile connectivity, with a great majority of the funds being granted to rail development projects, with only around EUR 25 million for road projects. The operation of the rail connection was granted to Depot tmZ Services S.L., owned by Spanish companies Terminal de Contenedores de Barcelona (TCB, 45%), tmZ (35%) and Hutchinson since 2015 through its subsidiary BEST, the company's new Barcelona semi-automated terminal and competitor of TCB (20%). Originally two other large Spanish rail companies where included in the picture: Comsa, the private rail operator and Renfe, the public rail operator had close to 35% of the shares but dropped them to the profit of TCB and BEST. The port of Barcelona retains some form of control of the company through its participation in tmZ.

The terminal has been a success with considerable traffic increases since its creation. Between 2013 and 2015, traffic more than doubled, going from 135 000 TEUs to over 305 000 TEUs, in part due to container traffic increases at the Port of Barcelona that is now connected to tmZ by six trains per day. In total, 125 000 containers where moved by rail between the port and the terminal in 2014. Along with other factors such as the inclusion of the Opel Mokka assembly lines within the Zaragoza General Motors plant, this led tmZ's board to approve expansion projects in 2015, to double the terminal's capacity in order to be able to accommodate growing demand for the services it offers. Since the beginning of this project, the Port of Barcelona has decided to invest in other logistics platforms along strategic supply chains for the port, in Toulouse (tmT) Lyon (tmL) and Perpignan that are all located in France.

Create framework for green ports policies

This measure aims at solving the absence of green port policies. The main elements of such a strategy are outlined below and the main recommendations include:

- Set up a continuous port air measurement programme.
- Define main targets for environmental performance of ports, including on air emissions.
- Develop a comprehensive approach on tackling air emissions from port activity.
- Give room to ports to develop their own instruments.

A systematic and continuous port air measurement programme should be set up. Port-related air emissions in Chilean ports are neither measured nor monitored. Only the port of Arica has started measuring its emissions and assessing its carbon footprint. Setting up a structural measurement programme for air emissions in ports would help in comparing port performances and reducing emissions by quantifying progress made every year. An example of such a programme can be found in Los Angeles (Box 4.11).

The government should define main targets for environmental performance of ports, including air emissions. These targets should be applied to both public and private ports and based on an analysis to establish what are the most substantial environmental impacts and risks.

Box 4.11. **Port of Los Angeles: How to create an air emissions inventory**

The Port of Los Angeles and the Port of Long Beach have had an Air Emission Inventory in place since 2005 to measure port-related air pollution and keep the public informed. This inventory is part of the San Pedro Bay Clean Air Action Plan (CAAP), designed to reduce air emissions and health risks associated with air pollution. The 2005 Inventory of Air Emissions serves as a baseline to measure progress on this action plan. The development of the air emission inventories was co-ordinated with the US Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAMQMD). Port tenants and shipping lines also play an essential role in providing accurate activity and operation information. The activity and operational data collected is then used to estimate emissions for each of the various source categories, consistent with the latest estimating methodologies agreed upon by the port and participating regulatory agencies. All the detailed annual inventory reports are available to the public on the port websites.

The inventories evaluate emissions from five port-related mobile source categories: ocean-going vessels (OGVs), harbour craft, off-road cargo handling equipment (CHE), rail locomotives (RL) and on-road heavy-duty vehicles (HDV). For each category, exhaust emissions are estimated for the following pollutants: particulate matter (PM) (10-micron, 2.5-micron), diesel particulate matter (DPM), oxides of nitrogen (NOx), oxides of Sulphur (SOx), hydrocarbons (HC) and carbon monoxide (CO). The ports started to conduct emissions estimates of greenhouse gases (GHG) from port-related operation from the 2006 inventory, which includes carbon dioxide (CO2), methane (CH4) and nitrous oxide (NO2). By using the 2005 activity levels as the baseline year, the subsequent inventories also provide the comparisons of main air pollutants between the baseline year and the evaluation year. In the 2011 report, the Port of Los Angeles observed a reduction in cumulative harmful emissions of 76% since 2005. Diesel particulate emissions declined by 71%, NOx emissions by 51% and SOx emissions by 76%.

Source: OECD (2014).

Table 4.6. **Instruments to reduce emissions in ports**

	Shipping activity	Port operations	Hinterland transport
Regulation	Speed limits when approaching port Low sulphur fuels in port		Truck retirement
Incentives	Tariff differentiation according to: - green ship design - fuel switches		Lower tariffs for cargo by train Truck retirement
Infrastructure	Shore power equipment	Electrifying equipment Renewable energy use	Dedicated short-sea terminals

Source: ITF/OECD elaborations.

A comprehensive approach should be developed for tackling air emissions from port activity. That means that ports should coherently develop instruments to mitigate emissions from ships, port terminal equipment and port hinterland transport, making use of instruments such as regulation, incentives, subsidies and infrastructure investments (Table 4.6). Rather than implement this in a piecemeal fashion, a complete package of inter-related instruments would be needed, along the lines of the San Pedro Bay Ports Clean Air Action Plan (Box 4.12). Ports should be granted more autonomy to develop their own instruments. In this way, instruments could be most appropriately designed in line with local circumstances. An example could be the right to introduce environmentally differentiated tariffs, with lower tariffs for ships that are cleaner.

Box 4.12. **San Pedro Bay Ports Clean Air Action Plan**

The San Pedro Bay Ports Clean Air Action Plan (CAAP) is a comprehensive strategy to reduce air pollution emissions from port-related cargo movement. The two San Pedro Bay ports, the largest seaport complex in North America, are also the single largest source of pollution in Southern California, according to the South Coast Air Quality Management District (SCAQMD). In 2005, the twin Mega-Ports of Los Angeles and Long Beach generated approximately 25% of the diesel pollution in the region (O'Brien, 2004). The CAAP aims to address the problem of the ports' growing operations and their increasing environmental impact. Its goal was to dramatically reduce emissions and associated health risks for the region without upsetting the continuous port development. The plan was first approved in 2006 and updated in 2010. Near-term plans through 2014 and long-term goals include reducing port-related emissions by 59% for NO_x, 93% for SO_x and 77% for DPM by 2023 and meeting standards to lower the residential cancer risk in the port area from diesel particulates. Under the plan, the twin ports have developed annual emission inventories, which are made public, to track progress in achieving CAAP standards. The CAAP uses a combination of regulations, fees, grants and incentives to the cargo industry to promote cleaner technology and operational systems, such as the Clean Truck Program, the Vessel Speed Reduction Program and the Alternative Maritime Power Program. To support the development and demonstration of clean-air technology, the ports have also jointly created a Technology Advancement Program that has provided more than USD 9 million in funding to the industry since 2007.

The latest analysis in 2011 indicates that the two ports have substantially reduced the key air pollutants from port-related sources since 2005, including a 71% and a 75% reduction in airborne diesel particulates, respectively. Several pillar programmes have significantly contributed to reducing air pollution at the two ports, including the Clean Truck Program (CTP) and the Vessel Speed Reduction Program (VSR).

The CAAP marks a milestone for the port industry in mitigating the environmental impact of maritime operations. The plan was a co-operative venture, and the two ports initiated the concept and brought along industry stakeholders and agency leaders (Giuliano and Linder, 2011). The key factor in its success is the co-

operation of port users, including terminal operators, truckers and shippers, as well as the support of federal, state and local regulatory bodies and local communities (Mongelluzzo, 2012). The ports were also under considerable social pressure. Community concern over the health risks of port-related diesel emissions had grown after a series of air quality studies was published on the correlation between cancer and respiratory disease rates and proximity to freight-movement corridors. Cargo volumes rose through 2004, in an expansion of capacity at the two ports, and public opposition, including a series of lawsuits, made expansion plans difficult if not impossible. Political pressure for increased regulatory oversight also prompted the ports to respond to public dissatisfaction over air quality. This ultimately led to the adoption of a comprehensive plan. The CAAP was portrayed as a solution to build the credibility of the ports to obtain agreements on future projects as they engaged all the key stakeholders. One study describes the CAAP as "a response to the loss of social legitimacy and to social and regulatory pressures that were restricting the ability of the ports to expand" (Giuliano and Linder, 2011). The two ports' market influence also played a role in the mitigation efforts, since their gateway location gave them more room to impose fees on the industry and generate the revenue to implement environmental policies.

Improve port-city relations

This measure aims at solving the poor co-ordination between urban and port policies. The main elements of such a strategy are outlined below and the main recommendations include:

- Strengthen the co-operation between cities and public ports.
- Come up with schemes that give cities a share of port revenue.
- Stimulate opportunities to use the port as a driver of local economic development.
- More closely co-ordinate port and urban planning.

Box 4.13. **Local government representation in world ports**

The majority of world ports have some kind of formalised local participation, also ports controlled by national governments. However, their influence varies according to the type of participation and practices are very different among countries. Some cities participate in a consultation body, others in a supervisory body or in a decision-making body. The majority of ports actually have local representation in their main decision-making body (Table 7). In this case, if the board needs a majority to make a decision, cities may get a wide influence on the appointment of the port president, the budget and long-term strategies. For example, in Busan (Korea), the municipality nominates all members of the port (Merk, forthcoming).

The co-operation between cities and public ports should be strengthened. This could take the form of more participation of cities in the decision-making of public ports and vice versa. In order to increase this participation in mutual understanding, capacity and competences would need to be enforced in order to increase potential value added and sustainability of proposals. As part of these efforts, cities could be granted a seat in port boards. This would increase the involvement of cities in ports and enlarge the opportunities of synergies between port and city - and would bring Chile in line with international practice (Box 4.13 and Table 4.7).

Schemes should be considered that give cities a share of port revenue, beyond the limited collection of a municipal tax on the declared capital (*patente*) of the port authority and the port operator. This would mean that they get an incentive to increase the attractiveness of the port, which currently they hardly have. A distinction should be made between ports owned by local vs. national

governments. The public ports in Chile are owned by the national government, but this might change if (some) ports were to be decentralised, along the lines of this Chapter's earlier suggestions.

Table 4.7. **Ports with formalised local institutional representation**

Port	Country	Body with local representation	Status of body	Share of local representation
Antwerp	Belgium	Board of Directors	Decision-making	At least 10 out of 18
All public ports	Brazil	Port Authority Council	Consultation	1/16 (local), 1/16 (state)
Vancouver	Canada	Board of Directors	Decision-making	1/11 (local), 2/11 (province)
Piraeus	Greece	Board of Directors	Supervision	1 out of 10 members
JNPT	India	Board of Trustees	Supervision	1 out of 16 (region)
Nagoya	Japan	Port Assembly	Decision-making	15/30 (prefecture), 15/30 (local)
Busan	Korea	Port Committee	Supervision	Nominates all 11 members
Marseille	France	Supervisory Council Development Council	Supervision Consultation	4 out of 17
Riga	Latvia	Board of Directors	Decision-making	4 out of 8
Ventspils	Latvia	Board of Directors	Decision-making	4 out of 8
Liepaja	Latvia	Board of Directors	Decision-making	3 out of 9
Manzanillo	Mexico	Board	Consultation	1 out of 8
Zeeland	Netherlands	Board of Governors	Decision-making	3/4 (local), 1/4 (region)
Gdynia	Poland	Supervisory Board	Supervision	4 out of 9
Algeciras	Spain	Management Board	Decision-making	5 out of 18 (region)
Barcelona	Spain	Management Board	Decision-making	4/16 (region), 2/16 (local)

Note: Local representation refers here to representation from the municipal level, unless otherwise stated. Regional representation refers to the relevant regional government levels in the country, such as region, state or province.
Source: Merk (forthcoming).

Box 4.14. **Local revenues from locally owned ports**

Revenues for local governments could be defined in the legislation in relative terms (e.g. X% of the profits),[3] in absolute terms (a EUR X dividend per year), and some ports might have minimum thresholds (minimum X% dividend). There are even voluntary schemes whereby port and local government annually negotiate the amount to be paid. These revenues to local governments can be substantial: the amount of the dividend paid out by the port of Rotterdam in 2012 was EUR 65 million. Sometimes the return of the port authority to the local community is indirect: e.g. by sponsoring the realisation of a new museum (cf. MAS in Antwerp) or a new stadium. Port authorities also co-finance road infrastructure that supports the mobility of the wider community, not only the port (Merk, forthcoming).

If certain ports in Chile were to be decentralised to local or regional governments, clear provisions must be designed so that local and regional governments get a share of port revenues (Box 4.14). For ports that remain in the hands of the national government, ways should be considered for local governments to benefits from the activity of their port. The most straightforward way for cities to benefit financially from port activities is via some sort of local taxation that covers the port and its activities. This is the way in which nationally owned ports in other countries contribute tax revenue to their cities, e.g. in Italy (Box 4.15). If a decentralisation reform in Chile were to assign taxes to local governments, it would be important to make sure that ports and their activities are also somehow included in some of these local tax bases. If a specific local port tax were to be introduced, it could be justified as a fee to offset the negative impacts from shipping and port activity on the locality; it could be levied as some sort of local port emissions fee.

Box 4.15. **Local government tax revenue from ports: The case of Italy**

In Italy, ports are exempted from paying property tax mainly because ports are already state-owned entities responding to a national port system. Port authorities have the administrative control on port areas on behalf of the central government. However, port areas often comprise land parcels that are privately owned, in addition to the ones directly owned by the state. In the case where a private terminal operator operates on a piece of land that is state owned, it does not pay any tax to the municipality but in the case where the terminal operator exploits land it privately owns it is required to pay local taxes in the same way a landlord will have to pay property taxes. These taxes are called IMU and TASI and are calculated on different criteria, among which the surface of the given piece of land. The ratio between privately and publicly-owned land at Italian ports varies from one case to the other but it can be substantial. As an indication, the port of Venice comprises 17 privately owned terminals out of 27 terminals in total.

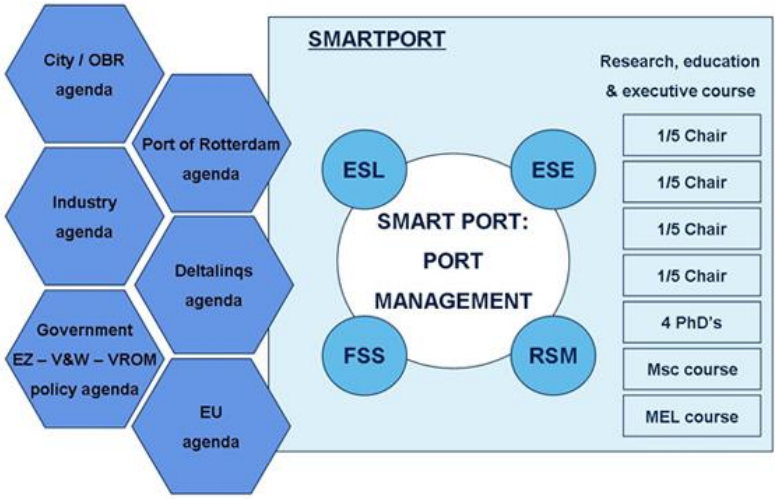
Opportunities to use ports as drivers of local economic development should be stimulated. This could take the form of possibilities to develop specialised maritime clusters in port cities. As the most important university town in Chile, Valparaiso could be the site of a maritime cluster based on research activities. This link between research and port activities was at the core of the SmartPort Rotterdam initiative, in which the port authorities partnered with the Erasmus University of Rotterdam and various other stakeholders (Figure 4.1).

Port and urban planning should be more closely co-ordinated. Cities and local governments should be considered important stakeholders when preparing and defining port master plans; this implies that they get special status in consultation processes and would need to be involved at the outset of the planning process rather than at the end. A similar principle should apply to urban planning; ports should have a privileged position in the urban planning and land use process, considering their spatial, economic and environmental footprint. The co-ordination of port and urban plans could be a regularly occurring agenda item at Port-City Committee meetings. The Port-City Committees should step up their activities and develop into a real platform for resolving challenges, along the lines of the Port-City Forum in the South African port-city of Durban (Box 4.16).

Such closer port-city co-operation could cover various issues and take different forms, depending on local circumstances. The competitiveness of Chilean ports could be improved by better managed flows to and from the ports. This requires planning of truck holding areas strategically selected to avoid interference with urban traffic. The economic impact of port and freight transport could be increased by linking these sectors to other economic sectors in the larger urban area; city-port co-operation might be helpful in identifying such potential links and creating networks to promote synergies. Similarly, port-city co-operation could be helpful in reducing negative impacts from ports,

such as air emissions and noise. Such issues could be addressed in a common master plan for port and city.

Figure 4.1. **Organisation of the Smart Port Rotterdam Initiative**



Note: Smart Port has been the initiative of the Executive Board of the Erasmus University Rotterdam, and the Deans of Four Schools: Erasmus School of Law (ESL); Erasmus School of Economics (ESE); Rotterdam School of Management (RSM); Faculty of Social Sciences (FSS). Deltalinqs are representatives of the port community, OBR is the Rotterdam municipality, EZ is the Ministry of Economic Affairs, V&W is the Ministry of Transport and VROM is the Ministry of Housing, Spatial Planning and Environment.
Source: http://www.erim.eur.nl/centres/smartporterasmus/about/

Box 4.16. **The Port-City Forum in Durban, South Africa**

The Port-City Forum in Durban aims to develop a sustainable and pro-active planning and co-operative framework between the National Ports Authority (Port of Durban) and the eThekwini Municipality (Durban municipality. The forum intends to foster constructive engagement concerning matters that collectively affect the port and the city, and attempts to overcome previous information asymmetries by stressing the need to "identify and disclose planning initiatives and development projects of mutual interest between the Port and the City".

The Port-City Forum comprises three sub-committees that fulfil separate joint-steering functions. The Strategic Leadership Committee, chaired by the eThekwini Mayor, meets once a year with national and provincial stakeholders to deliberate on a host of priority matters, including the sharing of strategic information, the creation and review of joint investment plans, the identification of key projects, and the scheduling of the annual programme. The Management Committee is chaired jointly by the City Manager and the Port Manager, and meets on a quarterly basis to deliberate on resource allocation for projects and the implementation of programmes and plans drawn up by the Strategic Leadership Committee. Finally, the projects Committee, chaired jointly by the Manager of the TNPA Planning and Development division and the Head of the eThekwini Economic Development and Facilitation division meets on a monthly basis. Its purpose is to manage projects, set up work teams, and generally implement any other task assigned by the Management Committee (ITF/OECD, 2014).

Notes

1 In Hong Kong, a program was launched to incentivise the replacement of the dirtiest trucks on the roads. Truck owners can receive a subsidy covering 18 to 30% of the cost of a new vehicle, depending on the age of the current vehicle they possess. This aims at phasing out 88 000 commercial diesel vehicles by 2019. Concerned vehicles are the ones that do not meet at least Euro 4 standards according to the Euro vehicle standard emissions; the estimated number is 128 000 in total.

2 "State-owned enterprises (SOEs) should observe high standards of responsible business conduct. Expectations established by the government in this regard should be publicly disclosed and mechanisms for their implementation be clearly established. Like private companies, SOEs have a commercial interest in minimizing reputational risks and being perceived as "good corporate citizens". SOEs should observe high standards of responsible business conduct, including with regards to the environment, employees, public health and safety, and human rights." (OECD, 2015)

3 E.g. 60% of the profit in the case of Rotterdam. That is 60% from 2021 onwards when the investment costs of the Maasvlakte 2 port extension have been amortised.

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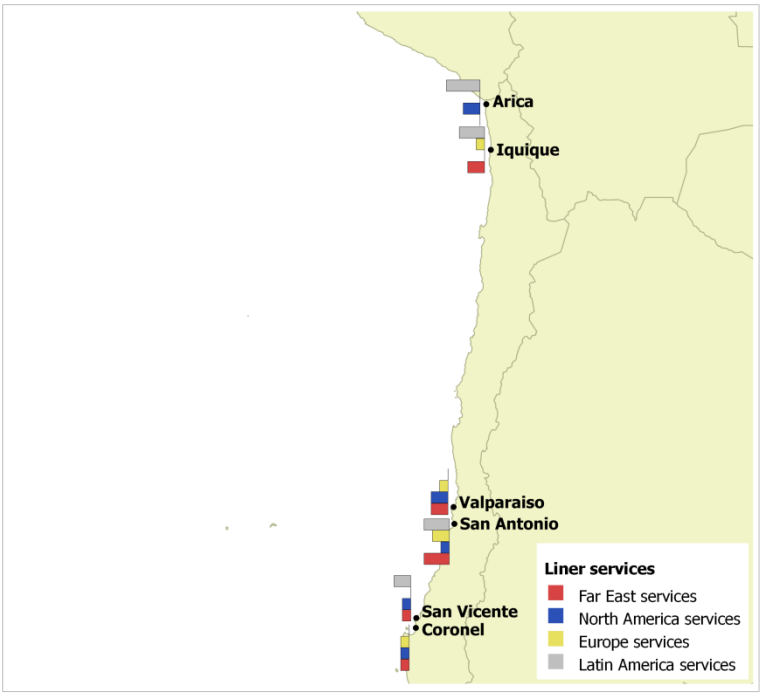
Annex 1. Container ship size forecasts for Chilean ports

The major container ports in Chile (Arica, Coronel, Iquique, San Antonio, Talcahuano/San Vicente and Valparaiso) handled a combined 3.5 million TEU in 2015. Though all the aforementioned ports are integrated into long-distance container services (Figure A1), transhipment does not play a significant role. The ports of San Antonio and Valparaiso are the busiest ports due to their proximity to the country's capital Santiago de Chile.

Figure A1. **Fully cellular container liner services calling in Chilean ports (spring 2016)**



Source: Own elaborations.

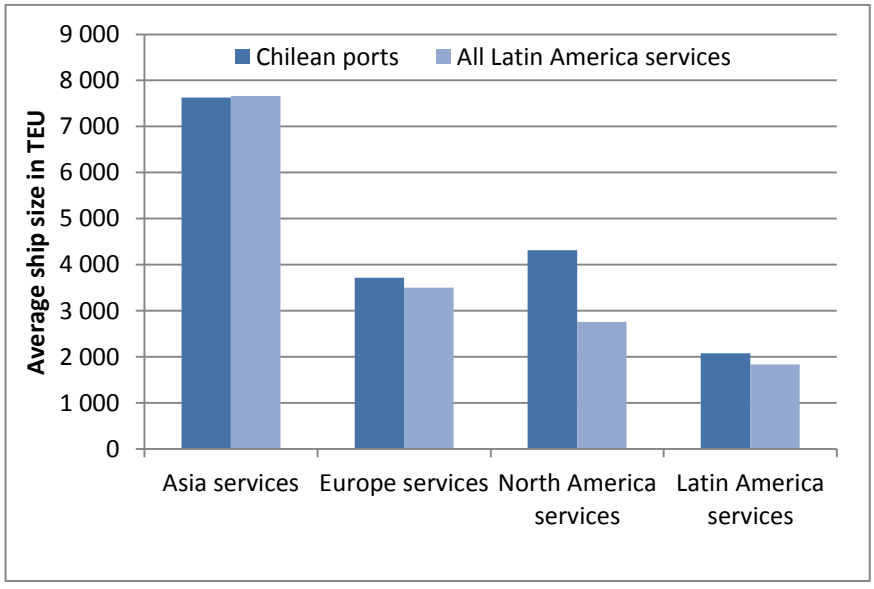
The integration of the ports in the liner operators' schedules determines the ship size profile. The largest ships are employed on Far East services with average TEU capacities between 6 300 TEU and 9 300 TEU and average maximum ship draughts between 13.3 m and 14.6 m. The Europe and North America services are served with vessels between 1 700 and 4 500 TEU, the intra-Latin America services with vessels of 700 to 3 000 TEU.

Given the continuing disproportionate fleet growth in the upper size segments, operators will be tempted to use ships currently employed on other routes (North America-Far East or even Europe-Far East) on South American trades. In order to forecast the impact of this cascade effect on ship sizes in Chilean ports, we have analysed the ships currently employed, forecasted the world container fleet development, and modelled the impact of the cascade effect on South America services in general and on Chilean ports in particular.

Liner services in Chilean ports in 2016

The average ship size on Chile trades has been compared with the market average, in order to check whether the general ship size trends on the major trade lanes also apply to ports in Chile. This comparison reveals that while there is a high overall alignment with the market average, the ships regularly sailing between North America and Chile are larger than the average ships on North America-Latin America trades. This general average is mostly driven by services between the US Gulf Coast and Florida on the one hand and the Caribbean on the other hand. These rather short-distance services drag down the market average on the trade.

Figure A2. **Comparison of average ship size in TEU between Chile services and Latin America services (spring 2016)**



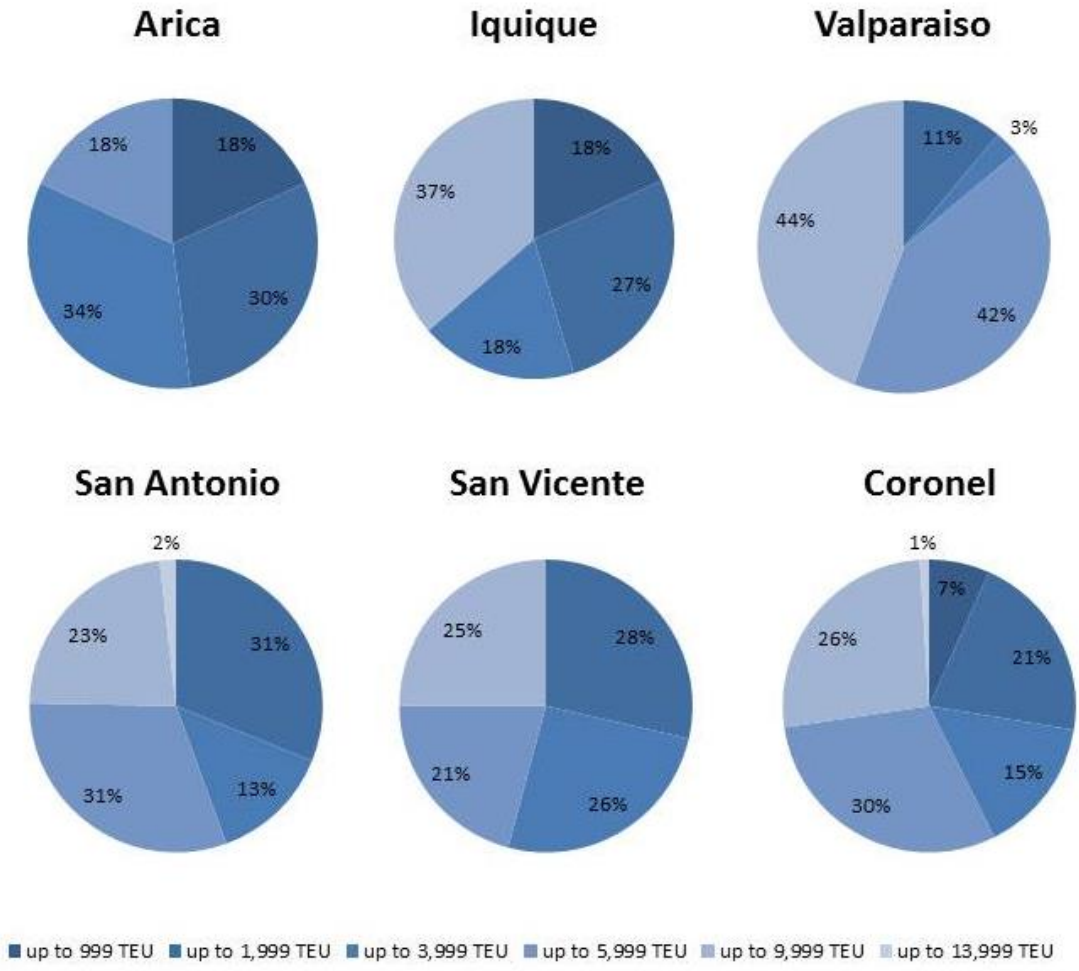
Source: Own elaborations based on MDS Transmodal (2016).

Due to this difference, a specific model distinguishing Chile trades from the other trades is used for the ship size forecast. An additional aspect is the impact of the Panama Canal expansion. All Chile-Europe and Chile-North America services pass through the Panama Canal. Four out of these six services are operated by 4 000+ TEU Panamax vessels. Though all ports are able to handle larger container vessels, they face draught restrictions in most of the ports. While Valparaiso and San Antonio are getting ready for larger ships, the other ports may face problems welcoming them and are hence in danger of being dropped from the schedules. Competition takes place mostly between Arica and Iquique in the North and between Talcahuano-San Vicente and Coronel in the South.

Scheduled container ship calls in single Chilean ports (spring 2016)

Each individual port has its particular ship size profile (Figure A3) which is closely linked to the types of services calling in the port (compare Figure A1). The share of scheduled calls with of container vessels with less than 2 000 TEU exceeds 40% in Arica and Iquique, while Valparaiso stands out with a very high share of post-Panamax vessels with capacities of more than 6 000 TEU.

Figure A3. **Number of scheduled ship calls by size class in Chilean ports (spring 2016)**



Source: Own elaborations based on MDS Transmodal (2016).

AIS data confirm that the post-Panamax vessels are calling in the indicated ports despite the existing draught restrictions for these types of vessels. One can therefore suppose that the vessels are no longer fully loaded when calling in Chilean ports. The draught is therefore a rather soft restriction – contrary to the length and beam restrictions imposed by the Panama Canal.

Container fleet forecast and cascade effect up to 2025

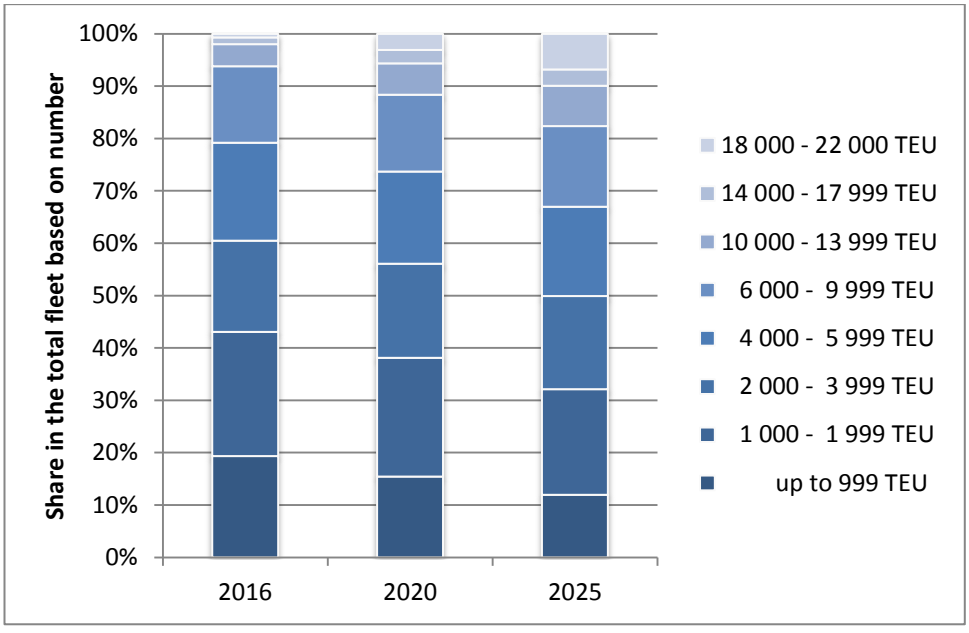
The increase of ship sizes and the cascade effect will continue to play an important role during the next years. According to ISL's container fleet forecast, the share of ships with more than 18 000 TEU will increase from 0.7% in 2016 to 6.8% in 2025, their number will increase from 35 to around 350.

The large number of new orders for ships with 400 metres length and 59 metres beam will fuel the crowding-out of smaller units from the Europe-Far East trades. Within a short time, ships of

18 000 TEU and more will be standard on the major North Europe-Far East routes, while operators will continue to use smaller ships on the minor Europe-Far East routes such as Mediterranean-Southeast Asia.

According to the cascade model, which estimates how ships will move from one trade area to another based on scale economies, the pressure to use much larger ships on the Transpacific trade (i.e. the "smaller" 18 000 TEU units crowded out of Europe-Far East) is imminent and ships of 18 000 TEU may be crossing the Pacific soon – even if the current 21 000 TEU ship design remains the largest until 2025.

Figure A 4. **Container fleet forecast 2016-2025 by size classes**



Source: Own elaborations based on ISL Container Fleet Forecast, June 2016.

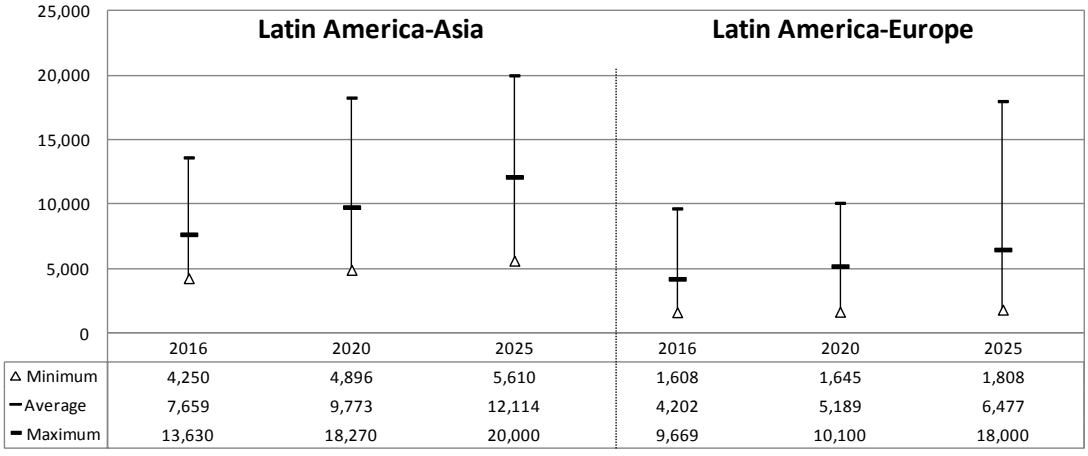
Through the cascade effect, this ship size increase will also affect South America trades. On Latin America-Asia trades, we may soon see the first 18 000 TEU vessels trickling down from the major East-West trades. After further ordering of 20 000+ TEU from 2017/2018 onwards (delivered after 2020), we may even spot the first 20 000 TEU vessels on this route by 2025. The average ship size on these trades will grow more gradually, but substantially from 7 700 TEU in 2016 to 12 100 TEU in 2025.

A rather surprising result of the model is the rather modest ship size growth until 2020 despite the Panama Canal opening. First, the services between Europe on the one hand and the Caribbean and the South American East Coast on the other hand are not affected as post-Panamax vessels are already used on this link. Second, despite the massive withdrawal of Panamax vessels from the fleet, there will still be many Panamax units looking for employment in the not-so-far future.

Due to the age structure of the fleet, wrecking of Panamax vessels will accelerate after 2020 and lead to an acceleration of the cascade effect in the medium size classes. Therefore, the average size on the Latin America-Europe services will increase markedly until 2025. At the same time, many of the "old" 18 000 TEU vessels – today still the state-of-the-art for the major East-West trades – will be looking for employment elsewhere and may also be spotted between Latin America and Europe. At

the same time, rather small units with less than 2 000 TEU may continue to trade on some services between Europe and the Caribbean.

Figure A5. **Forecast of ships deployed on major intercontinental routes up to 2025**



	2016	2020	2025	2016	2020	2025
△ Minimum	4,250	4,896	5,610	1,608	1,645	1,808
– Average	7,659	9,773	12,114	4,202	5,189	6,477
– Maximum	13,630	18,270	20,000	9,669	10,100	18,000

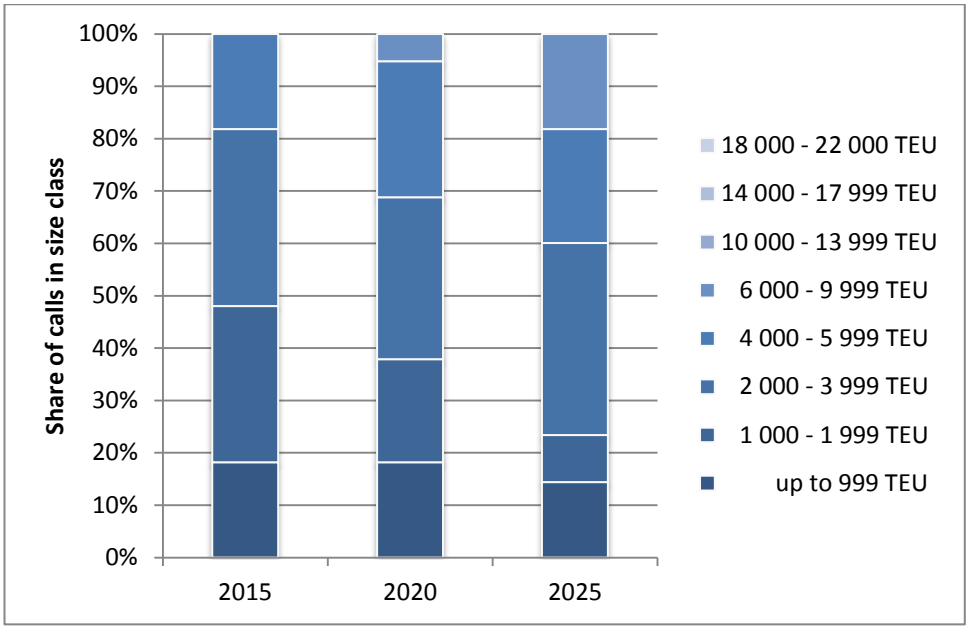
Source: Own elaborations based on ISL Container Fleet Deployment Forecast, June 2016.

Ship size forecast for the Chilean ports 2020 and 2025

The release of the Panama Canal restriction immediately affects one quarter of the regular liner services calling at Chilean ports. Panamax vessels with dimensions close to the Canal's previous maximum were used on these services (two U.S. and two Europe services). Nevertheless, we do not expect a sudden multiplication of ship sizes on these routes, but rather a steady increase.

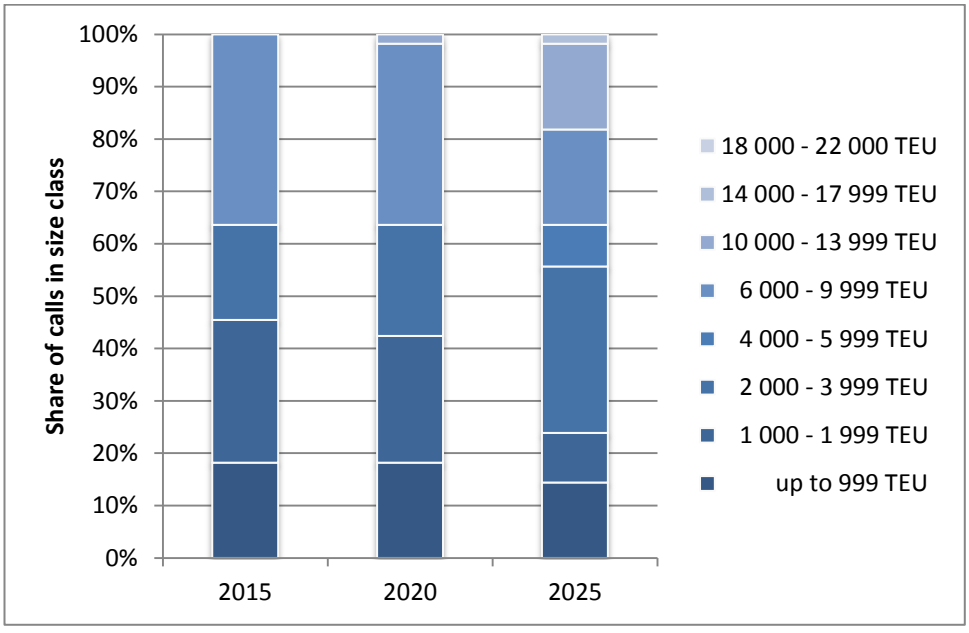
The two container ports in the North of Chile – Arica and Iquique – are served by several feeder services to/from other Latin American ports (Figure A1). Consequently, ships with less than 2 000 TEU generated more than 40% of the regular container ship calls in both ports (Figures A6 and A7).

Figure A6. **Ship size forecast port of Arica 2015, 2020 and 2025**



Source: Own elaborations based on MDS Transmodal and AIS data (2016).

Figure A7. **Ship size forecast port of Iquique 2015, 2020 and 2025**



Source: Own elaborations based on MDS Transmodal and AIS data (2016).

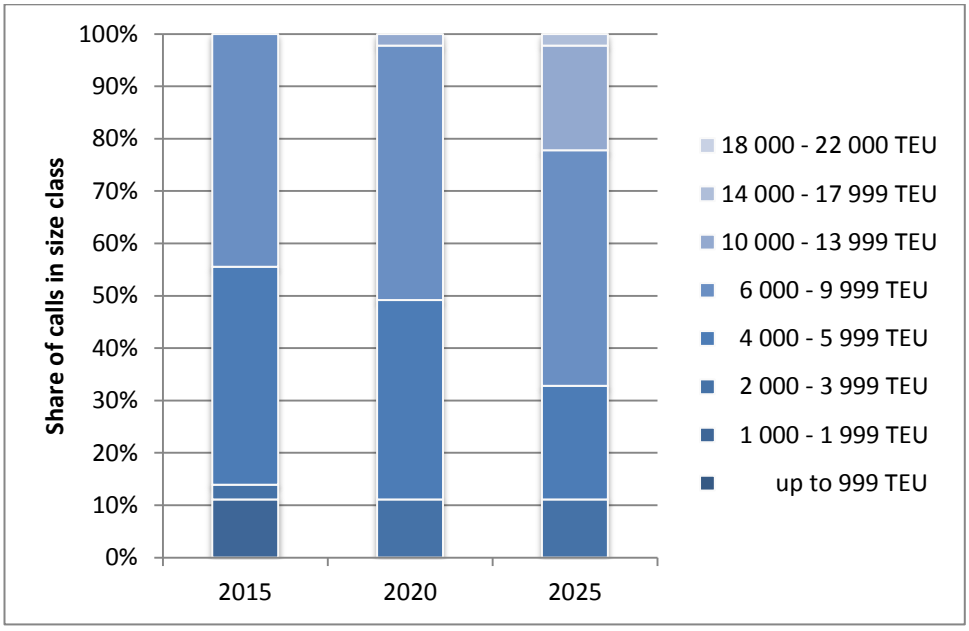
At the same time, the port of Iquique also hosts two Asia services with ships of around 300 m in length and capacities around 7 000 TEU. These trades – which seem to gain in relative importance in the world market and which do not involve a Panama Canal passage – are prone to see a scaling up of vessel sizes in the near future. First units with more than 10 000 TEU may enter this market by 2020

and by 2025, the model even predicts calls with vessels of 14 000 TEU and more on Asia-South America trades. If draught restrictions in the northern ports make calls of these vessels economically inefficient, then the share of feeder vessels to or from Panama may increase. There is, however, no risk of losing large traffic volumes as the ports handle hinterland traffic only. The distance to the Panama Canal area and other transhipment hubs is comparably short.

Chile's two major container ports near Santiago de Chile have rather high shares of intercontinental traffic. San Antonio did not even have a single intra-Latin American service – which is why the forecast assumes that already in 2020, there will be no more regular ship calls with ships of less than 2 000 TEU and that more than half of the calls will be post-Panamax vessels with 6 000 TEU and more.

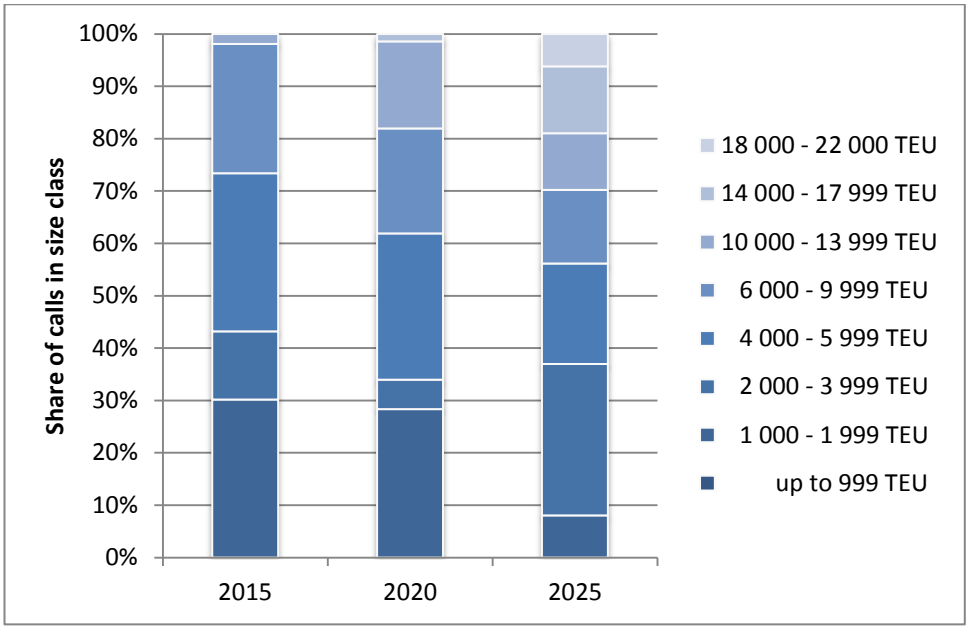
Without any changes to the distribution of services, San Antonio will continue to be the port with the highest share of post-Panamax vessels. A large portion of these vessels will be in the "Neo-Panamax" class, i.e. still able to pass through the expanded Panama Canal. On the Asian trades, however, the Canal does not restrict ship sizes so operators may have an interest to use even larger vessels on these trades by 2025.

Figure A8. **Ship size forecast port of Valparaiso 2015, 2020 and 2025**



Source: Own elaborations based on MDS Transmodal and AIS data (2016).

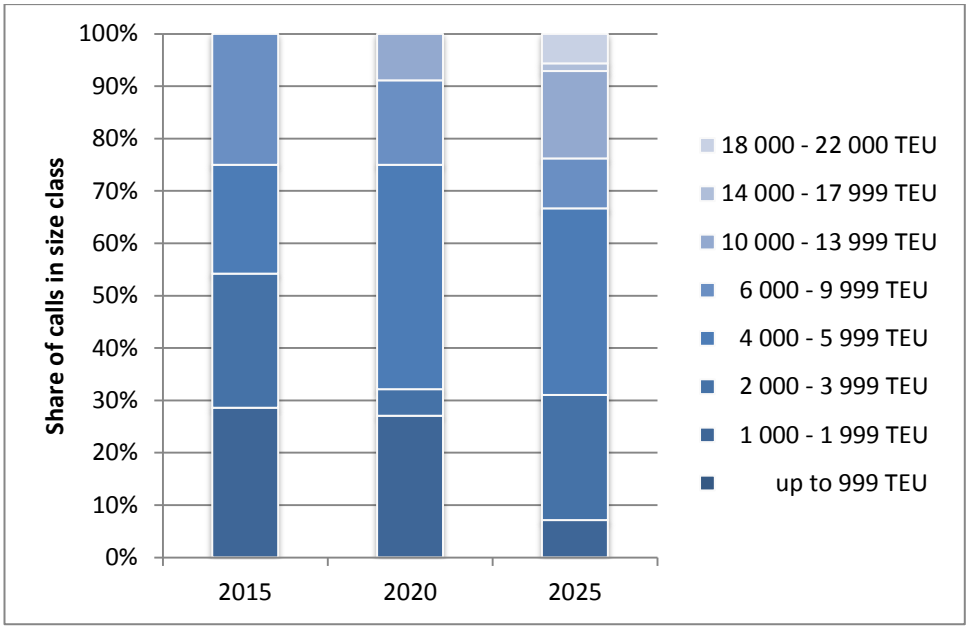
Figure A9. **Ship size forecast port of San Antonio 2016, 2020 and 2025**



Source: Own elaborations based on MDS Transmodal and AIS data (2016).

Some 400 kilometres further to the south, the ports of San Vicente (Talcahuano) and Coronel complete the list of Chile's major container ports.

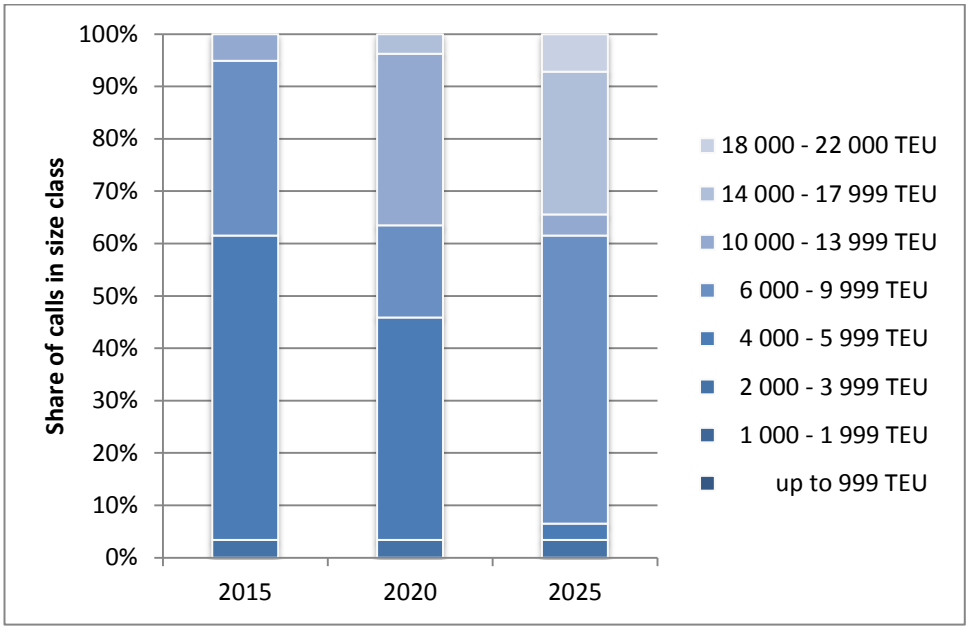
Figure A10. **Ship size forecast port of San Vicente 2016, 2020 and 2025**



Source: Own elaborations based on MDS Transmodal and AIS data (2016).

There are considerably less regular services than in the northern and central ports, but the share of inter-continental services is comparable to those of the central hubs. Here again, the share of ships with less than 2 000 TEU will strongly decrease, while Asia services will experience a scaling up.

Figure A11. **Ship size forecast port of Coronel 2016, 2020 and 2025**



Source: Own elaborations based on MDS Transmodal and AIS data (2016).

Based on existing service structures, the share of very large container vessels will be particularly large in Coronel: by 2020, one out of three container vessels regularly calling in the port may have a capacity beyond 10 000 TEU.

Conclusions

The Chilean port landscape is not characterised by large hubs and smaller feeder ports as in many other port ranges in the world. Even the smaller ports handling around 200 000 TEU per year regularly receive intercontinental services. The only port without any Asia or Europe services is the Port of Arica. All other ports will face Neo-Panamax vessels with dimensions adjusted to the expanded Panama Canal soon.

On Asia services, demand will be there to use even larger vessels by 2025. Whether the cascade effect will fully materialise in Chilean ports as modelled will depend on whether the ports are ready for these ships. In principle, one port for post-Neo-Panamax vessels per range would do as the hinterland of the ports within each range will largely overlap. However, the capacity of all ports will be needed when growth in the region gains momentum again.

Annex 2. Port-related investments in the Bio Bio region (1994-2016)

Lirquen	Mejoramiento Nueva Aldea Bifurcación Nipas Reposición Ruta Coelemu-Rafael-Tomé By Pass Penco Ruta Interportuaria Penco Talcahuano Ampliación Reposición Ruta 150 Concepción-Lirquen Mejoramiento Ruta 150 Concepción-Penco
Coronel	Ruta 160 Concepción-Los Alamos por Concesión Mejoramiento Acceso Sur al Puerto de Coronel By Pass Coronel Interconexión Vial Ruta 160-Puerto San Vicente-Ruta Interportuaria Mejoramiento Ruta O-852 Coronel-Patagual Ampliación Ruta 160 Concepción-Coronel Mejoramiento Ruta O-670 Copiulemu-Hualqui Puente Industrial
San Vicente	Mejoramiento Cuatro Esquinas-Hualpén Mejoramiento Eje Gran Bretaña-Alto Horno Mejoramiento Puente Biobío 2-Cuatro Esquinas-Talcahuano Ruta Interportuaria Penco-Talcahuano Interconexión Vial Ruta 160-Puerto San Vicente-Ruta Interportuaria Mejoramiento Avenida La Marina Puente Industrial

Annex 3. Australian cabotage reforms

The Australian case illustrates the complexity of the cabotage debate, and its political and ideological dimension. Australia is often presented as having a liberal position on cabotage. This may come from the fact that in Australia, the access to short sea-shipping is not based on the flag of the vessel, but on the payment of Australian wages (Brooks, 2012). In this sense, the Australian legislation does not define cabotage as a national monopoly as in other countries. However, this does not necessarily mean that the conditions to participate in cabotage create a level playing field between Australian-flagged and foreign-flagged countries. Initially, costal shipping was regulated by the Navigation Act (1912). Under this act "the market of coastal shipping services was open to foreign flag operators provided they meet Australian conditions and the participation of Australian nationals is not an overarching consideration" (Brooks, 2012). Both Australian and foreign-flagged vessels could engage in cabotage under a license –allowing unlimited access to coastal trading and requiring the crew to be paid at Australian rates. When licensed flag was unavailable, vessels could apply for a permit, allowing temporary access to Australian cabotage with fewer labour and wages requirements. Cockerell and Thompson (2015a) argue that this system was quite favourable to foreign ships, since permits were less demanding than licenses on wage requirements.

As Australia was facing a continuous decline of its fleet, the Labor government launched a reform of the Navigation Act in 2012, and set the current regulatory system, the Coastal Trading (Revitalising Australian Shipping) Act (CTA). The driver behind this reform was supporting the Australian fleet and it was accompanied by tax incentives for Australian shipowners, including a tonnage tax. Another driver was to create intermodal competition, so shipping could be competitive against rail and road transport. The CTA provides a three-tier license system in which Australian ships can operate under a general license, and foreign vessels under a temporary license – plus an emergency license in case of a catastrophe. This system gives a priority to the national fleet, while allowing foreign-flagged vessels to participate in cabotage. Partisans of the CTA, mainly the Maritime Union of Australia, estimate that it levelled the playing field between Australian-flagged and foreign-flagged ships.

According to opponents, the CTA complicated the system of permits existing under the Navigation Act, and generated additional administrative burden for foreign ships. The current government (Liberal/National Party) criticises the CTA for having resulted in a deterioration of short-sea shipping supply and an increase of costs – mainly because the CTA foreign vessels flying under a temporary license must comply with Australian employment conditions, including pay rates. Hence, this government designed the Shipping Legislation Amendment Bill (2015), a reform to liberalise cabotage. The bill – currently in the lower House, would replace the three-license system by a single permit, and only seafarers engaged in coastal shipping for more than six months would be required to comply with the Australian labour requirement (Fair Work Act). Hence, this bill would allow foreign ships participating in coastal shipping for less than 183 days per year, to pay the crew at foreign wage rates. The risk is that Australian shippers would not be competitive anymore; hence this reform triggers concerns about the loss of maritime jobs for Australian nationals. In a recent debate in the Parliament, senators evoked the option of considering another reform, going in the opposite direction to this bill – which means granting more protection to the national shipping lines.

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