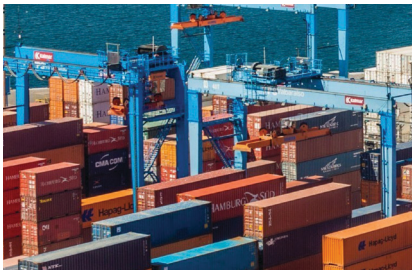
International Transport Forum

Logistics Observatory for Chile

Strengthening Policies for Competitiveness



Case-Specific Policy Analysis

OECD

Logistics Observatory for Chile

Strengthening Policies for Competitiveness

Case-Specific Policy Analysis

The International Transport Forum

The International Transport Forum is an intergovernmental organisation with 57 member countries. It acts as a think tank for transport policy and organises the Annual Summit of transport ministers. ITF is the only global body that covers all transport modes. The ITF is politically autonomous and administratively integrated with the OECD.

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Case-Specific Policy Analysis Reports

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Acknowledgements

The Ministry of Transport and Telecommunications of Chile is developing a statistical centre for freight transport. This observatory will compile data and key indicators related to trade, freight and logistics, facilitating decision making and monitoring their impacts on logistics performance. It will serve public and private sector in decisions related to several key policy areas, building on basic statistical system and transforming it into a more complete, goal-oriented set of data and indicators of performance together with research and analysis of the logistics sector.

The International Transport Forum (ITF) at the OECD provides a platform for Member governments to exchange experiences on the development of key policies with the aim of enhancing the performance and sustainability of transport systems and their contribution to economic growth and social welfare. Cooperation includes collaborative projects to review good practices, research on innovative policies, international benchmarking of performance and peer reviews of national policies in critical sectors.

As part of the program strengthening the development of policy making in key sectors of Member country governments, the International Transport Forum and the Ministry of Transport and Telecommunications of Chile organised a meeting with national and international experts on logistics observatories in Chile, 2-4 December, 2014. The workshop started with a plenary session followed by a two-day discussion involving several national logistics experts to discuss the role of the observatory, its key performance indicators and potential implementation plan. The entire session was moderated by Mario Waissbluth and attended by Pedro Ruz, Gabriel Aldoney, Julio Villalobos, Mauricio Paredes, Raimundo Veloso, Octavio Doerr, Sabah Zrari, Ricardo Subiabre, Pablo Manterola, Alexis Michea, Mabel Leva, Mauricio Casanova, Jari Kauppila, Gordon Wilmsmeier, Willem Heeren, Alain Lumbroso, Pablo Guerrero and Alan McKinnon.

This report summarises the results of the discussion and was prepared by Jari Kauppila and Alain Lumbroso of the International Transport Forum and four leading logistics experts: Willem Heeren (Dinalog), Pablo Guerrero (Inter-American Development Bank), Alan McKinnon (Kuehne Logistics University) and Gordon Wilmsmeier (UN Economic Commission for Latin America and Caribbean). The summary draws also on results from an ITF roundtable on Port Investment and Container Shipping Markets held in Santiago, Chile in November 2013.

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Key messages and recommendations

High quality logistics is a key for the economic performance of any country. Well-functioning logistics both domestically and internationally is a necessary precondition of national competitiveness. As an open economy, Chile relies heavily on trade for its economic growth. Lower transport and logistics costs as well as effective coordination between operators and public and private sector would improve Chile's competitiveness, boost exports and diversify production and trade patterns.

Global trade and transport facilitation indicators for Chile show a significant gap in comparison with high performing OECD countries. Chile performs well in logistics indicators in comparison with other Latin American countries. However, the logistics competitiveness of Chile can be significantly improved to reach the OECD average. Such an improvement can potentially have a huge impact on trade performance of the country.

National freight transport and logistics strategy needs to be supported with Key Performance Indicators. Understanding logistics performance is essential for evaluation and determination of transport and trade facilitation policies. Aligning regulatory policies, both landside and maritime, removing impediments to growing trade, such as inefficient border controls, restrictive cabotage policies, and completing the national logistics strategy are all particularly important factors for global supply chain competition. A set of Key Performance Indicators are essential to advance these policies.

The ITF review team identified a significant data gap in Chile – a logistics observatory is a key tool to bridge this gap. In order to evaluate the impact of logistics sector on social and economic development, the logistics observatory needs to be able to access and disseminate meaningful activity data and develop Key Performance Indicators to track the competitiveness of freight transport services and logistics operations in Chile. The observatory should also develop robust statistical and analytical methodologies in collaboration with international and national experts.

A logistics observatory has a potential to strengthen decision making. Key activities of the observatory should include data collection, analysis, dissemination and benchmarking for policy support. This will help creating trust in the data and analysis produced and promoting dialogue among stakeholders. On a longer term, the observatory has a potential to broaden activities, including information pooling and synthesis, publication of flagship reports, research, organisation of public events.

The ITF review team recommends the Ministry of Transport and Telecommunications takes leadership in implementing the logistics observatory in Chile. Strong governance and leadership, combined with good technical capability from a core team and stable, long-term funding are critical for the success of the observatory. It should build on existing data collection systems and structures and not replace those who already have legitimate roles and duties. ITF review team proposes a phased approach for the implementation over the next three years.

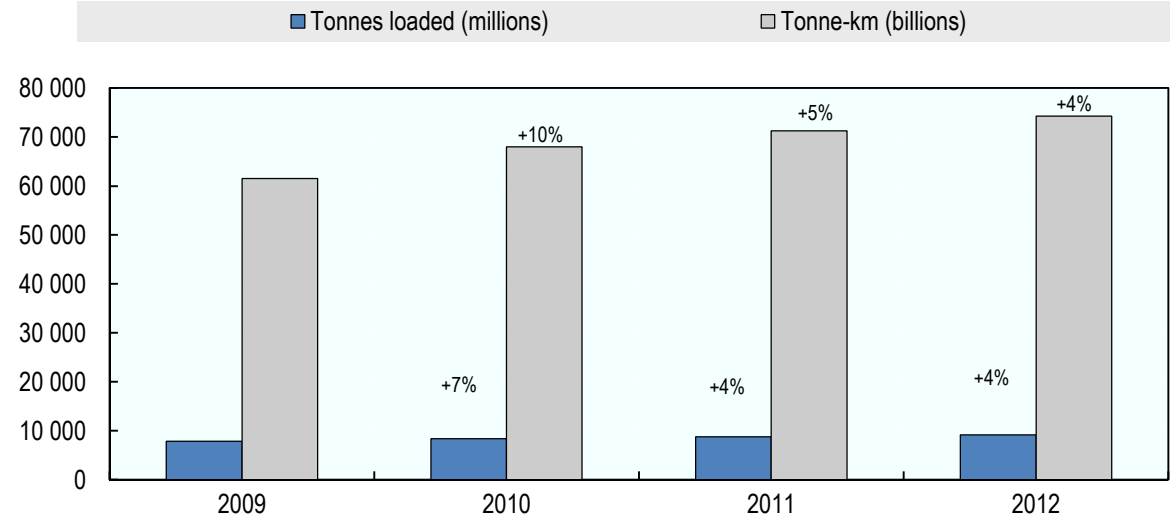
A logistics observatory must have the legal right, the technical ability and the resources to acquire, store and disseminate all necessary data elements.

A world-class transportation statistics program will enable Chile to leap-frog to the ranks global leaders in transportation statistics. It should be built on both mandatory and voluntary reporting, in cooperation with key Chilean and international stakeholders. A communication strategy should be put in place to disseminate logistics research and analysis, both in Chile and in international fora. The observatory should act as secretariat to a panel of Chilean logistics leaders.

Importance of logistics performance for Chile's competitiveness

Global trade and maritime volumes are on the rise again after the 2008 financial crisis (see Figure 1). As a result of the global and regional increases in population levels and economic activity, the maritime transport is expected to exceed 160 trillion tonne-km by 2030 and 250 trillion tonne-km by 2050. This increase is driven by the changes in the product composition but also by growth in the average hauling distance caused by changes in the geographical composition of trade. The expected growth of international freight transport by 2050 will set unprecedented challenges to the transport system and lead to increasing capacity constraints around the world (OECD/ITF, 2015).

Figure 1. **World seaborne trade**
Million tonnes and billion tonne-kilometres

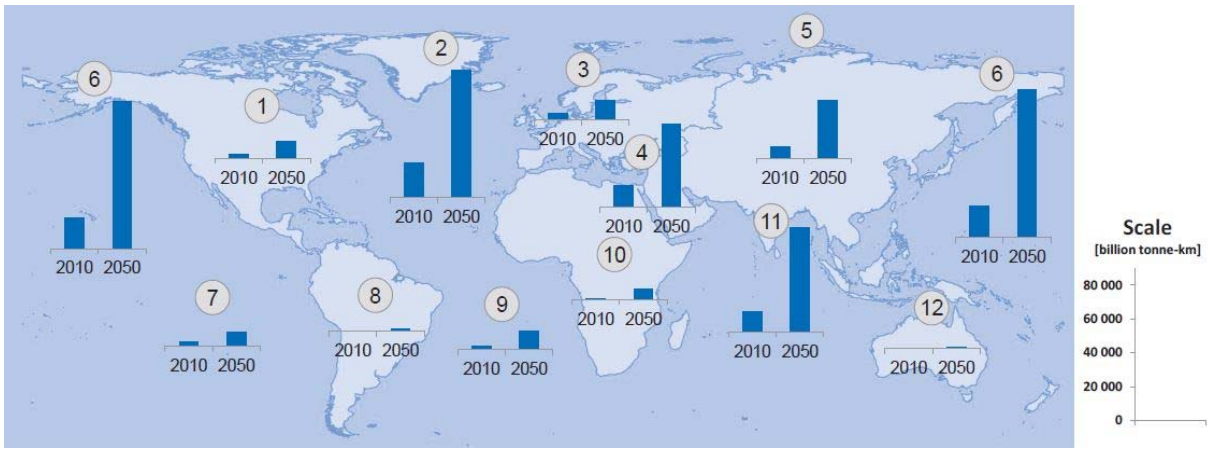


Source: UNCTAD Review of Maritime Transport 2013.

By 2050, the North Pacific corridor will surpass the North Atlantic as the main freight corridor. A significant growth will also take place in the Indian Ocean and Mediterranean and Caspian Sea corridors. This reflects the shift of the economic centre of gravity towards Asia resulting from the greater trade between Asia and the rest of the world, especially North America, Africa and Europe. South Atlantic corridor (between South America and Africa) is expected to grow by 270% while South Pacific corridors freight volumes will grow by 400% by 2050 (OECD/ITF, 2015).

Increasing international trade will set unprecedented challenges also to port capacities. Globally, tonnes of goods loaded and unloaded at ports will grow by a factor of 3.8 by 2050 from their 2010 levels. Indeed, ports around the world are planning expansions to respond to the growth of containerised maritime trade and to the development needs of hinterland economies. Large-scale port projects have effects on land use and local economies that are more difficult to reverse in the short-medium term. Therefore, these impacts should be examined as part of the broader development of national freight and logistics strategy (ITF, 2015a).

Figure 2. **International freight in tonne-kilometres by corridor (2010, 2050)**
Baseline trade scenario



1) North America; 2) North Atlantic; 3) Europe; 4) Mediterranean and Caspian Sea; 5) Asia; 6) North Pacific; 7) South Pacific; 8) South America; 9) South Atlantic; 10) Africa; 11) Indian Ocean; 12) Oceania.

Source: OECD/ITF, 2015.

As an open economy, Chile relies heavily on trade for its economic growth. As part of the policy for ensuring development of growth, Chile is one of the most open emerging economies based on the tariff structure and is on par with the OECD average in trade openness, measured as the ratio of total exports and imports in GDP (OECD, 2011). However, trade liberalisation alone does not guarantee economic benefits. Benefiting from liberalised trade requires world-class logistics services with efficiency and capacity.

Chile's economy has made progress over the last 20 years and its per capita income more than doubled during this time to be the highest in Latin America. This economic growth has slowed sharply since mid-2013 and is projected to pick up only modestly in the near term (OECD, 2013), while on the long term, growth is expected to accelerate. However, there has been a consistent slow growth of productivity over the past few years with total factor productivity growth (TFP) stagnating during the 2000s (Johansson et al, 2012; Bitrán, 2014).

Well-functioning logistics both domestically and internationally is a necessary precondition of national competitiveness (Arvis et al., 2014). Global production networks depend on transport operations, and this dependency affects a wide array of value-added activities along supply chains from suppliers of raw materials to the end-user.

High quality logistics is a key for the economic performance of any country. Quality logistics services play an important role in facilitating the transportation of goods while inefficient logistics services impose extra costs in terms of time and money.

Chile has a relatively competitive road and ports infrastructure, mainly due to the policies implemented in the mid-1990s. These policies promoted the use of public-private partnership for road and airport construction through the Law of Public Works Concessions. The maritime port sector was modernised with the creation of port companies and the concession of berthing fronts.

The national road network, managed by the Ministry of Public Works and its concessionaires, extends nearly 80 000 kilometres. One fifth of the network is paved. Road freight accounts for nearly 90% of total freight in the country (measured in tonnes of goods) while the share of railways is less than

10%, reflecting the low level of competitiveness and probably lack of trust/confidence of shippers on the rail mode. As rail generally handles longer haul traffic, it is possible that rail's share of tonne-kilometres would be significantly higher, though many rail movements connect mines to ports over relatively short distances. According to IADB (2014), the average length of haul for rail is only around 150 km. In the absence of average length of haul and tonne-km data for road transport, it is not possible to accurately quantify Chile's modal split. The road freight sector is characterised by a high level of fragmentation and low modernisation. The number of companies was estimated at nearly 40 000 in 2012, with the average road haulage business operating only 6.4 vehicles (IADB, 2014). Of these, around 96% are small companies with sales less than USD 1 000 a year (Source: INE estimations). Most of the companies are owned and operated by a single driver with limited possibilities to apply driving hour restrictions.

Chile has bilateral commissions with Peru, Bolivia and Argentina for agreements related to the operation of border crossing points. These border crossing points have been prioritised for their importance for trade and regional integration.

Ports are essential nodes in supply chains of many countries, in particular those dependent on external trade. Various studies have illustrated the link between efficient, well-functioning ports and external trade performance. Chile is more dependent on maritime trade infrastructure than many other economies, due to its geographical location, physical geography and export profile. Chile's exports account for 38% of GDP compared to an average of 27% in OECD countries. Approximately 95% of Chile's foreign trade is transferred through its ports, with 26% of the total tonnage transferred by three state-owned ports – Valparaiso, San Antonio, and San Vicente – located in the central-south part of the country, close to the centre of economic activity around Santiago and some of the country's main agricultural areas. Main exports of Chile include copper products, forest products and agricultural products. Container transport is concentrated in the three central ports. Ports in the north and south account, respectively, for the major part of mine and forest products. The competitiveness of these exports depends on the efficiency of specialised port complexes respectively in North, South and Central Chile (ITF, 2015a).

Currently, there are 68 ports in Chile. They can be grouped in three categories:

- 10 state-owned, public use ports, distributed along the entire coastline, from Arica near the border with Perú to Puerto Natales and Punta Arenas in the vicinity of Cape Horn.

- 15 privately owned public-use ports, with terminals developed by private companies. These ports transfer containers as well as bulk cargos, and are located in the bays of Mejillones (north of the country), Quintero (centre) and Concepción (centre-south).

- 43 privately owned, private use ports. These are terminals developed by private companies whose core business is not port operation (for example coal power plant operators) or developed by companies under contract to large freight generators (for example copper mines). They are located in a variety of zones along the coast.

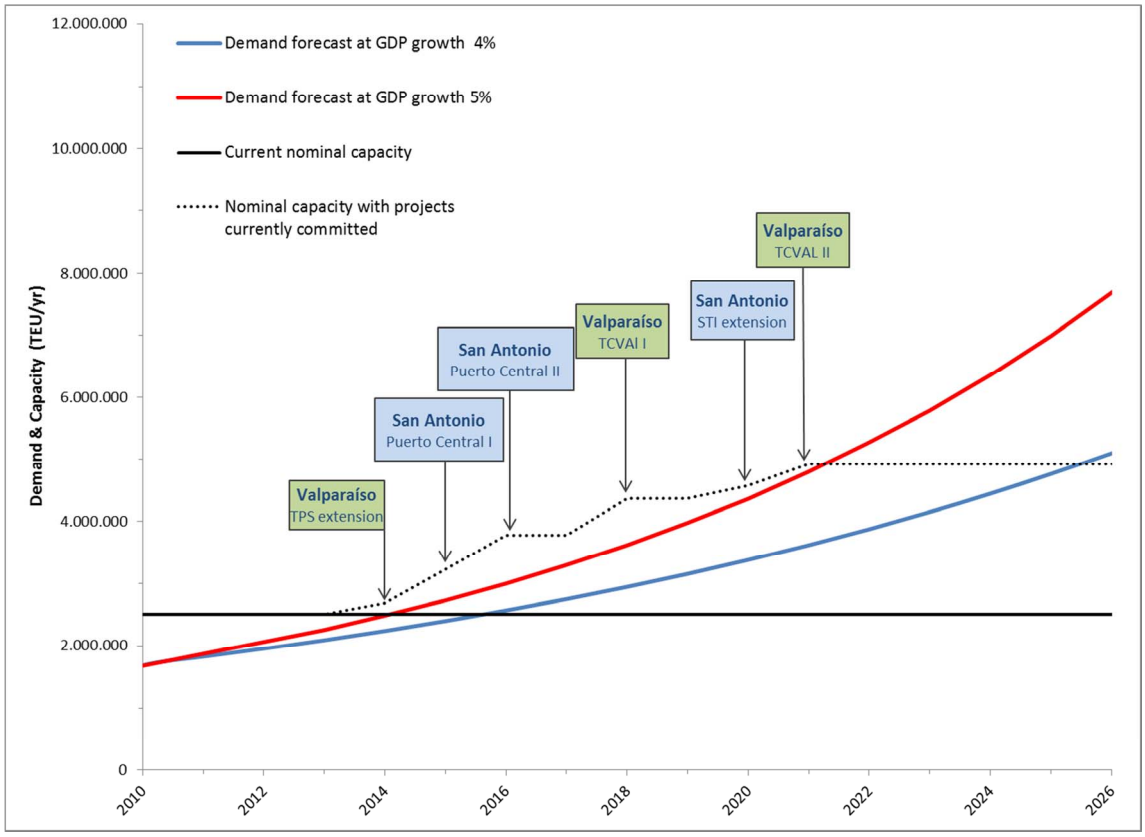
Central Chile accounts for 66% of the total population and 60% of GDP. More than half of shipping tonnage (for public ports) takes place through ports in the region and significant volume of imported retail goods and agricultural produce for export are taken through the region. Central Chile has also a significant container volume: average traffic in the last three years (2010-12) totals 1.9 million TEUs/year (Michea, 2013).

Figure 3. **Ports in central Chile**

Source: Michea (2013).

Chile's rapid economic development is reflected in the container traffic growth and to meet growing demand in a dynamic economy, the Chilean Ministry of Transport and Telecommunications is planning for large-scale container port capacity expansion (Figure 4). With committed facilities potentially reaching saturation in a decade, a major expansion of port capacity is planned. In this context the Ministry began work on a National Ports Development Plan in 2012 to provide long-range vision on port capacity needs and a strategy for landside infrastructure development so that private investments in port terminals are able to deliver the services needed by the national economy. Following an initial examination of four potential locations in the central region – Ritoque, La Ligua, San Antonio and Valparaiso – the two latter ports were identified as potential sites for a large new container port with several terminals (Michea 2013).

Figure 4. **Demand and capacity for existing and projected container terminals in the Santiago region**



Source: Michea (2013).

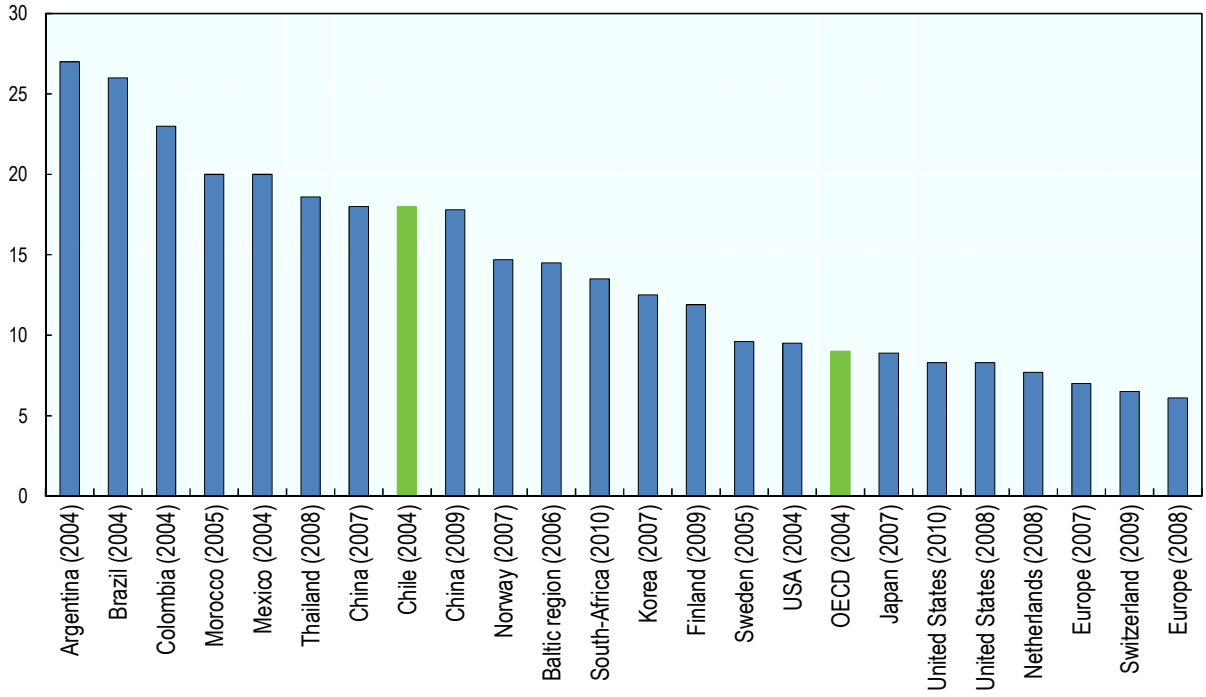
Generally, Chile's ports score well on port performance indicators. The average ship turnaround time in most Chilean ports is relatively short, the productivity of most port terminals is high for Latin America and the introduction of one or more private concessionaires operating terminals has facilitated the application of international best practice (Merk, 2013).

Many ports in Chile are located in, or close to, city centres, which has resulted in traditional port-city tensions with respect to land use. With respect to certain maritime services (e.g. pilotage), Chile appears to be fairly restrictive, as illustrated by its score of 0.60 for maritime transport on the OECD FDI Regulatory Restrictiveness Index, more restrictive than most other OECD countries (average score is 0.26).

Coastal shipping is underdeveloped in Chile, but presents opportunities considering Chile's long and stretched coastline. Most of the imported goods to Chile are handled in the two main container ports in Central Chile (Valparaíso and San Antonio) and then trucked to their final destination, including to the north and south of Chile. Considering the elongated coastline of Chile and its many ports, it would make sense to facilitate coastal shipping on these long-range distances, which would reduce road congestion and reduce air emissions. The restrictive environment for foreign involvement in cabotage services is limiting competition in the coastal shipping market, with possibly negative consequences to logistics costs. Coastal shipping in Chile could be developed by liberalising the current cabotage legislation, which is restrictive to foreign involvement – unusual for an otherwise very open economy. A growth in coastal shipping would also require a strengthening of the major ports' capability to tranship cargo between deep-sea and coastal vessels.

Lack of comparable data limits the ability to benchmark logistics costs in different countries and several reasons can explain higher than average logistics costs, including structure of trade. It is however estimated that logistics costs, as percentage of GDP, are 50% to 100% higher in Latin America (and Chile) compared with OECD countries (OECD, 2014a). This affects the region's competitive position in international trade. Lower transport and logistics costs would improve domestic firm's (including small and medium size) competitiveness, boost exports and diversify production and trade patterns.

Figure 5. **Logistics costs as percentage of GDP**



Note: The term "Logistics costs" is vague and often ill-defined or understood. Statistics-based studies rely on data that covers only national activities. Irrespective of method, the increasingly complex and international supply chains of firms and related service provision are becoming more difficult to study. These numbers are therefore indicative, at the best.

Source: Rantasila and Ojala (2012).

Physical, administrative and informal restrictions are big obstacles to the movement of goods and to international trade. Improving only border administration and transport and communications infrastructure would lead to an increase of some 5% in global GDP, six times more than would result from complete worldwide tariff elimination (WEF, 2013). High quality logistics services also improve the competitiveness of exports and enhancements in the quality of the logistics sector are positively associated with increases in trade. Freight transport performance is a strong determinant of national economic competitiveness and is dependent on a number of factors including legislation, infrastructure, international agreements, haulier and shipper performance and overall supply chain integration and technology.

All components of trade logistics (customs procedures, tracking and tracing services, overall infrastructure and logistics competence) impact trade more significantly, by several magnitudes, than do distance or freight costs (Korinek and Sourdin, 2011). As global supply chains have become more complex, value is added more incrementally in more locations. This places greater emphasis on the intermediate links in so-called global value chains. For these chains to be routed through a country its value-adding activity must be competitive but so too must be its logistics services and border

management. The development of industrial policies also requires improvements to logistics. This not only involves promoting the development of the logistics sector, but also formulating more broadly-based logistics policies (ECLAC, 2008).

In other words, trade and transport facilitation are at the core of stimulating economic development. There is also a strong reciprocity between the two: trade and transport facilitation fosters logistics performance, and better logistics supports growth, enhances competitiveness and enables investments. Political decisions and implemented policies have both direct and indirect effects on the attractiveness of a region or of a country in terms of business location decisions. In this sense, the volume of foreign direct investment (FDI) present in a territory is a good indicator of its attractiveness. Transportation systems are considered as a production factor and as one of the key determinants of facility location decisions. Transport infrastructure has a significant impact on the productivity and the cost structure of private firms (Haughwout, 2001). Empirical studies show that foreign direct investment is more attracted to areas where transportation systems are more efficient (Saidi and Hammami, 2011).

Good infrastructure must always be accompanied by high quality service provision. The term infrastructure must also be broadly defined to include ICT and energy networks as well those carrying freight and passenger traffic. These inter-connected networks must also be effectively managed both individually and in combination to ensure that there is sufficient capacity to meet logistical requirements.

Reliability of operations is a major concern for traders and logistics providers alike, and predictability of supply chains is becoming ever more important. Efficient border crossing is essential in eliminating avoidable delays and enhancing predictability in the clearance process. Coordination among relevant government agencies will play a major role in these efforts, including the need to introduce best practices in automation and risk management. It also underpins the operation of a national "Single Window" for the administrative aspects of international trade

More generally, logistics performance is strongly associated with the reliability of supply chains and how predictable the available services are to traders. Supply chains are becoming more and more complex, as they often span many countries. Comprehensive reforms and long-term commitments from policymakers and private stakeholders will be essential to keep up with the changing world.

The environmental sustainability of supply chains is a growing concern of shippers and logistics providers, particularly in wealthier countries. In the World Bank's Logistics Performance Index (LPI) 2014, for example, about 37% of respondents shipping to OECD countries recognised a demand for environmentally friendly logistics solutions, compared with just 10% for low-income destinations (Arvis et al., 2014). As pressure mounts to decarbonise freight transport operations both within and between countries, their carbon intensity will become an increasingly important carrier selection criterion. To meet its carbon reduction commitments Chile will have to monitor the trend in logistics-related emissions and put in place policies to control these emissions. Carbon emissions are only one of several externalities associated with logistics. Many of the air quality problems Chile experiences are due in part to exhaust emissions from freight vehicles and vessels, while the noise irritation, vibration and accidents they cause also impair the quality of life for many citizens.

Most middle and high-income countries have recognised the need for consistent policy responses to the growth in trade volumes and changing configuration of global value chains. The necessary reforms involve many stakeholders and are often slow to implement, and sometimes fragile due to governance weaknesses or lack of political continuity. Successful reforms also depend on detailed, accurate data involving information sharing among stakeholders. In summary, countries that have successfully

introduced far-reaching changes have combined regulatory reform with investment planning, inter-agency coordination, and incentives for operators (Reis and Farole, 2012).

A sustained improvement calls for policymakers and private stakeholders to implement comprehensive reforms. To move products to market efficiently and reliably, countries need to reduce trading costs and adopt policies to support trade, and in this way, help improve international competitiveness. There is also, however, an important domestic dimension to logistics, which generally accounts for the vast majority of freight movements and affects national economic performance, social welfare and environmental quality at a more fundamental level. Later sections of the report examine the role an observatory could play in supporting decisions that affect Chile's international connectivity and the domestic logistics.

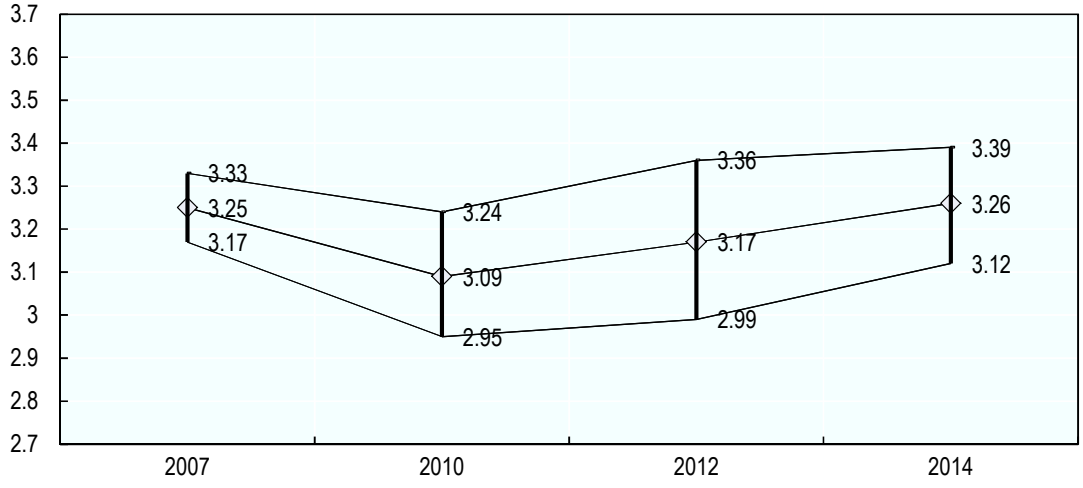
Chile's trade and transport facilitation performance

Overall, Chile's trade and transport facilitation performance is relatively good in comparison with other Latin American countries. However, several of the indicators show rather significant gap in comparison with high performing other OECD countries.

The World Bank Logistics Performance Index (LPI) and its components measure the efficiency of national supply chains and provide an international benchmark for the performance of the national logistics sector (World Bank, 2014). Since its first publication in 2007, the LPI has significantly enhanced the dialogue between policymakers and the private sector as they determine priorities in trade and transportation facilitation. Understanding the components of trade and logistics performance can help countries improve their freight transport efficiency and identify areas of their relative weaknesses and strengths vis-à-vis competitors. The *Connecting to Compete* report with the LPI has been published in 2007, 2010, 2012 and 2014. It is important to acknowledge that evaluations in the international LPI come from respondents outside the country being evaluated. The responses therefore reflect a country's "logistics friendliness" as it is perceived by logistics professionals.

Chile's LPI ranking is currently the highest in Latin American economies. Figure 6 presents Chile's LPI scores with confidence intervals from 2007 to 2014. In 2014, Chile is ranked number 42 among 160 countries, with a score of 3.26 – ahead of other Latin American countries. It also ranks ahead of few EU countries, including Greece and Lithuania but still behind many other OECD countries, such as Australia (17th) and New Zealand (24th). Chile's overall ranking dropped in 2010 from 32nd to 49th and despite an increase (5%) in its overall LPI score from 2010 to 2014, Chile's ranking has not reached the 2007 level. The confidence interval of the score is rather narrow, suggesting a relatively high degree of statistical significance in the performance estimates.

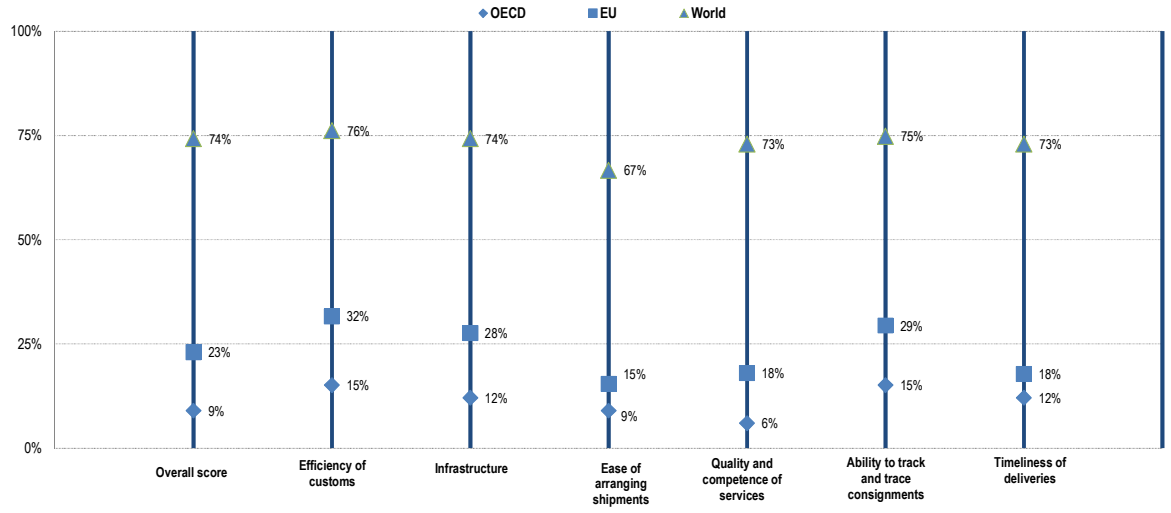
Figure 6. **Chile's Logistics Performance Index score 2007-14 with confidence intervals**



Note: with confidence intervals (min. = 1, max. = 5). Source: Arvis et al., 2014.

The strengths and weaknesses in Chile's relative performance are revealed by more detailed analysis of the six dimension of the LPI. Figure 7 displays the percentile ranking of Chile against the World, OECD and EU for the overall LPI score and its six sub-components. Overall, Chile ranks in the upper quartile of countries compared with global results. However, in comparison with the EU and OECD countries, Chile's logistics performance generally falls to the lowest quartile. Chile performs slightly better in efficiency of customs, infrastructure and ability to track and trace consignments, but less well in ease of arranging shipments, quality and competence of services and timeliness of deliveries.

Figure 7. **Chile's Logistics Performance Index percentile ranking compared with reference groups**



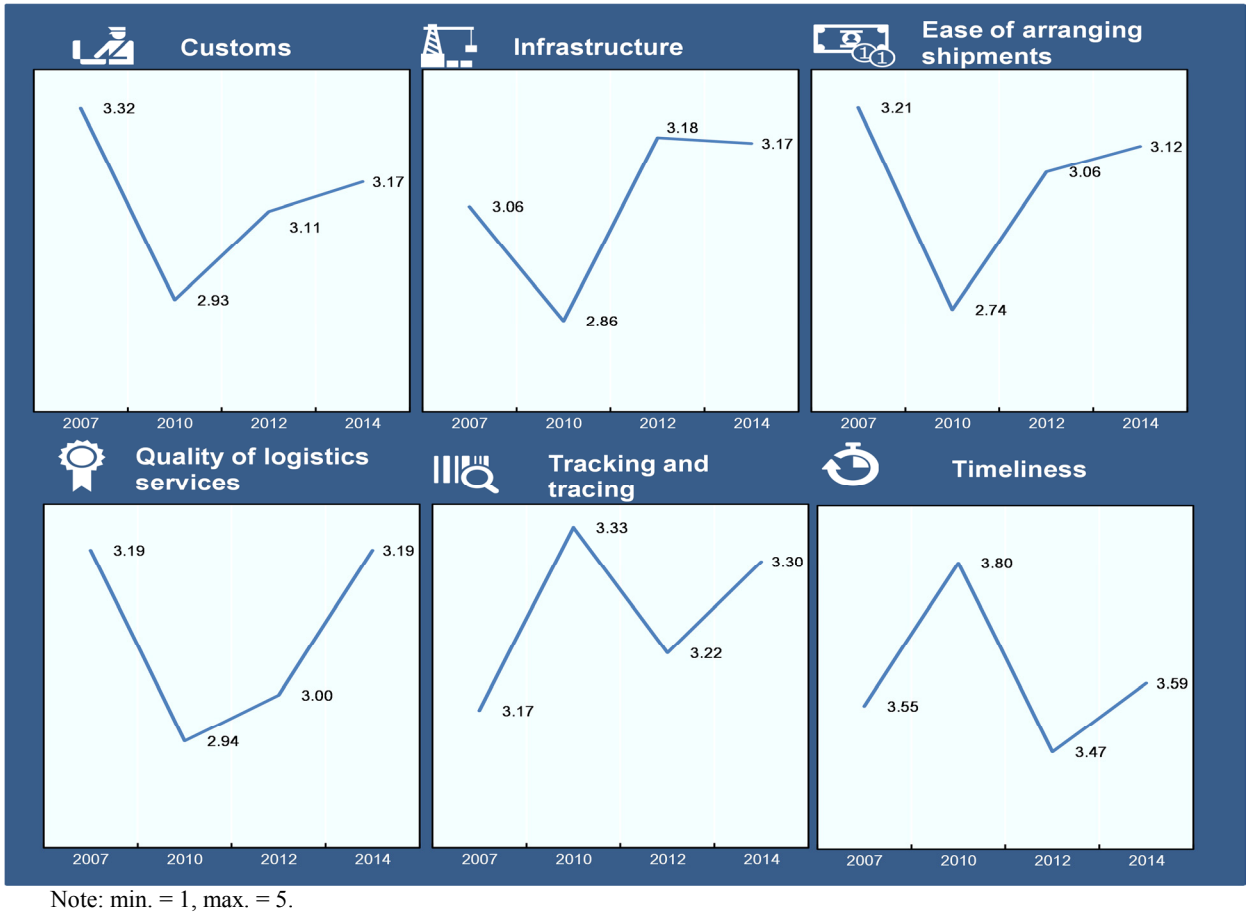
Note: Vis-à-vis selected peer groups: World (N = 160), OECD (N = 34) and EU (N = 28). Source: Arvis et al., 2014.

Trends for the individual dimensions of the LPI in 2007-14 are presented in Figure 8. The absolute scores showed significant declines from 2007 to 2010, after which there has been improvements in most of the dimensions. However, in 2014 only the quality of logistics services dimension scores the highest over the previous studies. This suggests there is a significant room for improvement for the logistics services in Chile.

Box 1. World Bank Logistics Performance Index

The World Bank's Logistics Performance Index (LPI), also known as the Connecting to Compete report, provides a comprehensive international comparison tool to measure the trade and transport facilitation friendliness of countries. The LPI has two main parts: the International LPI, where up to 166 countries are benchmarked against each other, and the Domestic LPI, which provides an insight on a set of logistics conditions within each country. The compilation of the index is performed primarily through an on-line survey that has been responded to by approximately 1 000 professionals in international freight forwarding. The International LPI looks at six dimensions that capture the most important aspects of countries trade logistics performance, where each dimension is rated on a 5-point scale (Arvis et al., 2014): 1) Customs; efficiency of the customs clearance process; 2) Infrastructure; quality of trade and transport-related infrastructure; 3) International shipments; ease of arranging competitively priced shipments; 4) Logistics quality; competence and quality of logistics services; 5) Tracking and tracing; ability to track and trace consignments; 6) Timeliness; frequency with which shipments reach the consignee within the scheduled or expected time.

Figure 8. **Chile Logistics Performance Index scores by dimension (2007-14)**



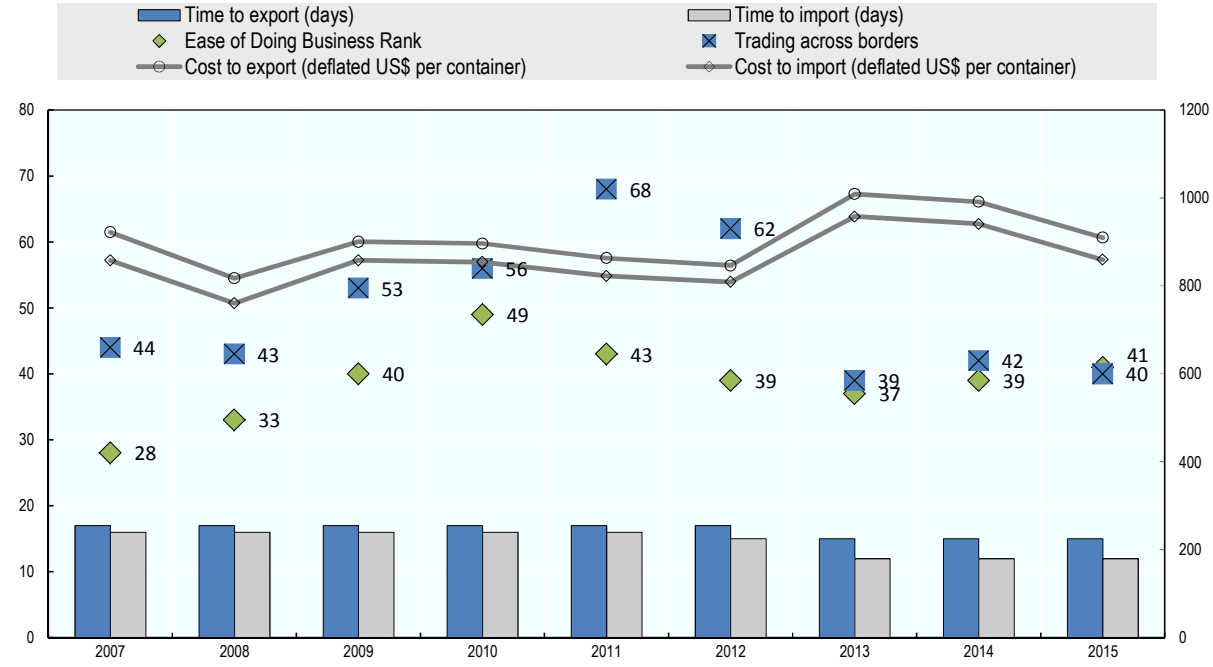
Note: min. = 1, max. = 5.

Source: Arvis et al. 2014.

The World Bank's *Doing Business* study presents quantitative indicators on business regulations and the protection of property rights that can be compared across 189 economies. The study ranks economies on their ease of doing business, from 1 to 183, based on regulations affecting several areas of the life of a business, including: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency.

A high ranking on the ease of Doing Business index means the regulatory environment is more conducive to the starting and operating of a local firm. Chile's ranking in the latest *Doing Business* report is 41, ahead of several EU and OECD economies (*Doing Business*, 2015). The overall ranking fell continuously between 2007 and 2010 from 28th to 49th. This fall coincides with the fall in the indicator for trading across borders. Since 2011, the overall ranking for Chile has remained at around previous levels.

Figure 9. **Ease of doing business and trading across borders ranks and related indicators for Chile**

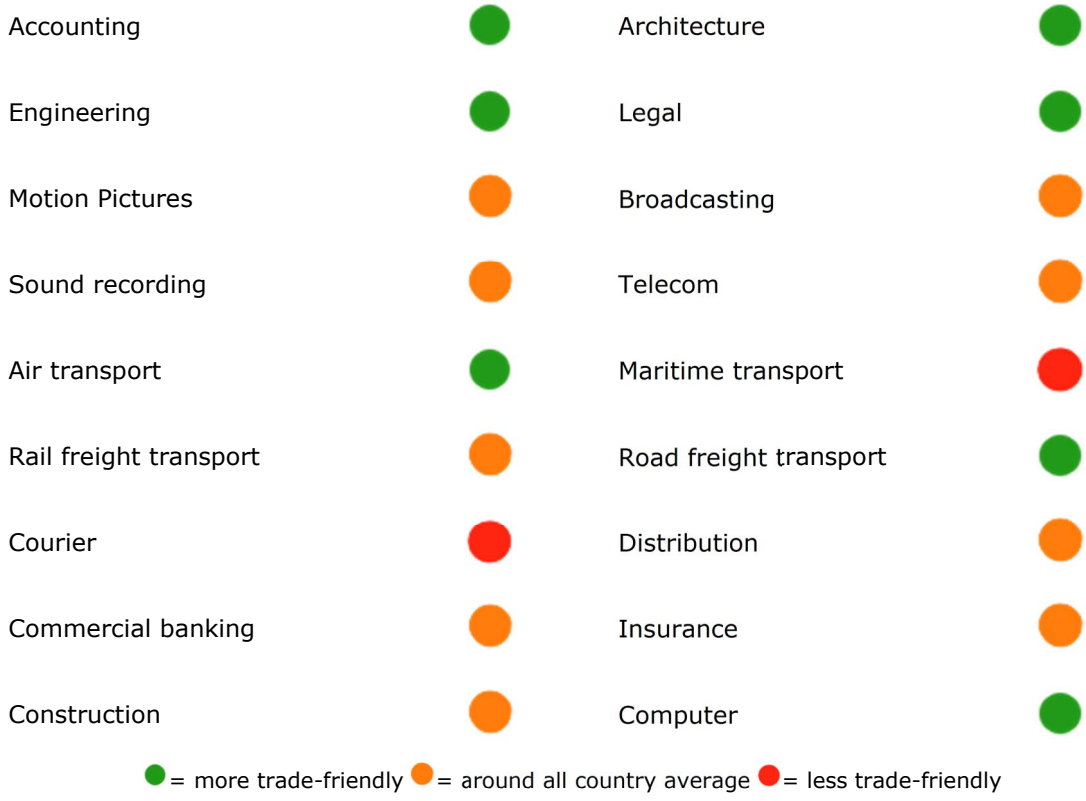


Note: min. = 1, max. = 5.

Source: Arvis et al. 2014.

The OECD's Services Trade Restrictiveness Index (STRI) helps identify which policy measures restrict trade. It provides policy makers and negotiators with information and measurement tools to open up international trade in services and negotiate international trade agreements. Chile's scores on the STRI are below the average in 12 out of 18 sectors. Road sector is one of the lowest scores as the road freight transport sector is fully open to the establishment of foreign firms, with no specific conditions imposed on their entry and operations. The maritime transport sector is among the highest STRI scores, explained mainly by restrictions on market entry. Air transport sector has relatively high score because in order to register an aircraft, a company must be incorporated in Chile. However, it is significantly below the average of all countries (OECD, 2014b).

Table 1. **Chile: barriers to trade in services**



Source: OECD, 2014b.

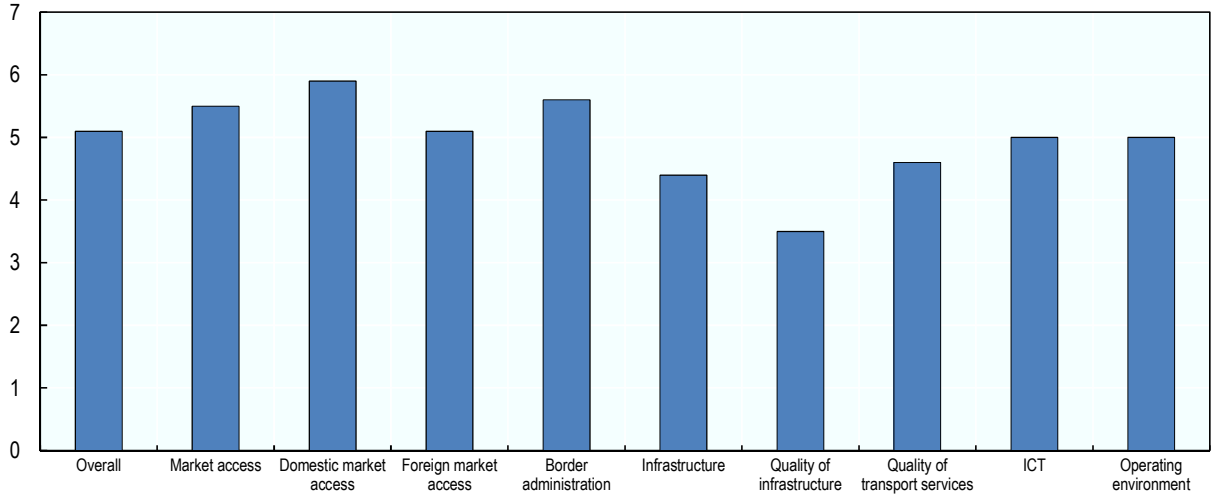
The World Economic Forum's Enabling Trade Index (ETI) captures the various dimensions of enabling trade, breaking them into four overall issue areas (which all are divided to several subcomponents):

- *Market access.* This sub-index measures the extent and complexity of a country's tariff regime, as well as tariff barriers faced and preferences enjoyed by a country's exporters in foreign markets.
- *Border administration.* This sub-index assesses the quality, transparency and efficiency of border administration of a country.
- *Infrastructure.* This sub-index assesses the availability and quality of transport infrastructure of a country, associated services, and communication infrastructure, necessary to facilitate the movement of goods within the country and across the border.
- *Operating environment.* This sub-index measures the quality of key institutional factors impacting the business of importers and exporters active in a country.

There is an overlap between the ETI and the LPI as they share data on some variables. Performance in the ETI largely mirrors the position on the development ladder. A higher level of income is typically associated with a higher ETI score. Chile performs very well in the index, ranking eight in the world.

More specifically, Chile is number one in market access sub-index. However, Chile scores low in the availability and quality of infrastructure and quality of transport services. One of the most problematic factors for trade is considered the high cost or delays caused by international transportation (WEF, 2014a).

Figure 10. **Enabling Trade Index results for Chile (2014)**



Source: WEF, 2014a.

Finally, the Global Competitiveness Report ranks Chile number one in the Latin American region and 33rd overall globally. The report assesses key factors and their mechanisms and interrelations that determine economic growth and the level of present and future prosperity in a country. The report defines competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. Chile performs relatively well in macroeconomic environment, financial market development, and institutions dimensions. However, labour market efficiency, infrastructure and innovation are some of the lacking indicators (WEF, 2014b).

Based on above, it is clear that the logistics competitiveness of Chile can be improved. Such an improvement can potentially have a significant impact on trade performance of the country. While the following correlations should be interpreted in terms of their association rather than causality, these calculations provide an insight on the development of international trade in parallel to logistics performance. Korinek and Sourdin (2011) suggest that improvements in general logistics quality have a stronger trade-enhancing effect on exports as compared to imports. On the average, for every 10% increase in the LPI of a typical exporter, bilateral imports increased by nearly 70%, holding fixed the influence of the remaining determinants of trade. We estimate that if Chile's logistics services were on a par with high-income OECD economies, other things being equal, its trade could increase by 40 to 50%. Reaching the top performer's (Germany) LPI score could potentially increase trade by 140 to 180% (Kauppila, 2014). Further, recent OECD study suggests that improvements to logistics services could substantially boost productivity in Latin America. Improving region's LPI score has a potential to improve labour productivity by about 35% (OECD, 2014a).

Measuring performance to develop national freight and logistics strategies

A sound and comprehensive set of national-level performance indicators is critical to constructive high-level policy dialogue and effective implementation of strategies to improve logistics. Performance evaluation helps to improve the efficiency of the system, including the infrastructure and regulations on which supply chains depend. Understanding logistics performance is essential for evaluation and determination of transport and trade facilitation policies. To improve performance, governments need objective, evidence-based, metrics to:

- measure activity
- provide reliable benchmarks
- monitor and compare global advances in logistics
- assess impacts of policies
- improve the country's logistical competitiveness
- develop strategies to enhance the overall economic competitiveness
- measure the environmental impact of logistical activity.

Logistics is increasingly considered as a priority. Different types of "logistics observatories" exist around the world today performing a variety of functions, from monitoring logistics performance and building reliable indicators to platforms for knowledge dissemination and supporting training and research in logistics. An observatory should have the capability, possibly working in partnership with research institutions, to analyse much of the data that it collects to provide deeper insights and answer policy-relevant questions. In terms of their governance and responsibilities, some countries have multiple observatories focusing on specific sub-sectors, some housed by government, others by industry (Box 2).

Logistics observatories collect and publish data for a range of purposes. These might be divided as follows (see also ITF, 2015b):

- *Descriptive macro-economic data*, providing information on the size and value of the sector in the economy, its spatial configuration and inter-relationships between markets. This information creates awareness of the importance of the sector to the economy and is used by Finance and Economics Ministries and National Banks to monitor economic performance. It is used to understand the wider economic impacts of infrastructure investment and design regional development policies. It is also used to understand what determines market prices. Logistics is also a large consumer of energy and its costs sensitive to fluctuating energy prices.

- *Micro-economic performance data*. This is used to describe and understand the way businesses in the sector operate and the impact of government regulation. It covers a wide spectrum, from

indicators of trade and traffic volumes to the productivity of vehicles to time spent in inspections. Micro-economic data is concerned with the firm rather than the economy as a whole. Similarly it is concerned with the performance of government and the impact of government intervention on business. It is used to understand the structure of supply chains and logistics businesses and analyse levels of competition/integration, and to examine asset utilisation and infrastructure capacity and measure productivity and business performance. And it can be used to benchmark performance between ports, for example, or between countries. Much sector specific analysis will require detailed data from industry that can only be collected by questionnaires and interviews. Industry associations sometimes have sufficient interest and support from their members to conduct surveys a regular or one-off basis. Government in cooperation with industry and academia can be critical to the success of an observatory. In the Netherlands, for example, Dinalog's joint research projects produce data that would otherwise be very difficult to obtain.

- *Performance indicators* are derived usually from micro-economic data and used to set performance targets either explicitly or as a consequence of being used to describe an activity. Care must be taken in choosing numerators and denominators for the performance ratios which induce the desired behavioural response. Poorly targeted KPI's can be gamed, altering behaviour to meet the target rather than to improve performance in ways that matter to the ultimate consumer.

- *Data on logistical externalities:* this can be collected at different spatial scales. At a national level in developed countries, there is increasing interest in the carbon footprint of freight transport and potential for reducing it. At a local level, particularly in urban areas, air quality is a more pressing concern, while along particularly corridors accidental levels can be policy priority. Major advances have been made over the past 10-15 years on the measurement and monetary valuation of the environmental effects of transport. This provides an observatory with the methodological tools required to monitor logistics-related pollution levels and assess the impact of environmental policy initiatives.

- *Specific analytical reports*. These can focus on particular policy issues, the logistical demands of individual sectors or the needs of a region or city. They would supplement the more routine collection of core data, often be separately resourced and often based on primary research. An example of the type of analytical output it could produce would be the report of a recent ITF Roundtable on *Port Investment and Container Shipping Markets* (ITF, 2015a).

Box 2. Examples of different types of logistics observatories

In the Netherlands, the government has established in 2009 a non-profit institute, Dinalog, the Dutch Institute for Advanced Logistics (http://www.dinalog.nl/en/about_us/), with a focus on training and collaborative projects between businesses, government, universities and other knowledge institutions for innovation in logistics. It is supported with 12 million euros grant funding a year from government and co-financed to the same amount by industry and knowledge institutions. Its goals are:

- To be the premier European institute for applied research and executive post-experience education in logistics and supply chain management.
- To act as a catalyst for the retention and attraction of innovative business activities in the area of supply chain control, concentrated on the Supply Chain Campus Breda.
- To develop scientific knowledge on advanced logistics with worldwide acknowledgement, in both the academic and business community.
- To create an environment that attracts world-class researchers and where innovative companies are willing to base their key professionals to work on improving supply chain and logistics management.
- To provide interaction with world-class international researchers.
- To develop, organize and create markets for post-experience education in supply chain management and logistics, closely cooperating with its partner network.

France has multiple observatories focusing on specific sub-sectors:

- The National Road Freight Transport Economics Observatory focusing on information on costs, prices and taxes in the sector (http://www.cnr.fr/).
- Regional transport and logistics observatories, for example for Alsace, covering transport and/or logistics sectors in many of France's regions (http://www.ortal.eu/).
- The French-Italian transport observatory, focusing on cross-border transport and development of infrastructure between the two countries (http://osservatoriotrasporti.eu/fr/observatoire-des-transports-franco-italien/).
- The Observatory of Transport Policy and Strategy in Europe, housed in the Ministry of Transport, covering all modes and both freight and passenger transport with the mission to set analysis of transport systems and policies in an international, and in particular a European Union, framework (http://www.developpement-durable.gouv.fr/Presentation-de-l-OPSTE.html).

While **the United States** does not have a specific logistics observatory, the US Department of Transportation's Bureau of Transportation Statistics and Federal Highway Administration cooperate to produce an annual report Freight Facts and Figures. Underpinned by the statistical resources and expertise of the two agencies this provides a comprehensive set of data on the physical characteristics of the national freight transport system and the freight moved, with selected indicators of congestion, environmental impacts, performance in relation to safety and the contribution of the sector to the economy.

A general observation can be drawn from the international experiences. Those that have been successful have a clear objective defined with a practical policy connection. Successful observatories have also a strong commitment both from public and private sector as well as regular feedback on indicators and their usefulness.

General data requirements

Freight transport is usually characterised as being the life-blood of a country and vital for its economic development, but political acknowledgement of its importance often does not extend as far as the statistics bureau. As presented in McKinnon (2015), little or no data gets collected to establish the nature and scale of the freight task and how it is changing. Evidence-based policy making is clearly impossible within a statistical vacuum, leaving officials to rely on anecdotes, intuition and lessons learned from other countries. Regrettably, this is the situation in much of the developing world, where the macro-level study of freight transport has to start from a clean slate.

At the other extreme are some developed countries with a long tradition of collecting freight data, where a range of parameters are carefully tracked on the basis of sample sizes that are large enough to make reasonably accurate assessments of patterns and trends. Even there, however, the statistical base is never complete. No country collects all the freight data that policy-makers and their analysts require to model, let alone understand, the detailed workings of the freight transport system. With the advent of Big Data there will potentially be a step-change in the availability of freight data, allowing many of the existing gaps to be plugged and permitting the macro-level analysis of freight flows and operations at a higher degree of granularity.

For many countries, the immediate objective is to collect enough freight data to answer four key public policy questions about freight transport (McKinnon, 2015):

1. **How much freight is being moved?**

   The amount of freight movement can be a good barometer of the level of economic activity. There has traditionally been a close correlation between freight tonne-kilometres and GDP, though the ratio of these variables can decline as an economy develops and services increase their share of total output. Knowing how much freight is being moved also indicates the related transport demands for infrastructural capacity, fuel, labour and vehicles. It can also shed light on the aggregate level of freight-related externalities.

2. **Where is the freight going and where it is coming from?**

   Knowledge of the spatial pattern of freight flow is critical for infrastructure planning, the development of regional development strategies and the management of port and airport hinterlands. In an ideal world, statisticians would be able to track freight consignments across multi-link supply chains from initial origin to final destination, revealing the structure of logistics networks and product routing (McKinnon and Leonardi, 2009). Regrettably, the real world of freight statistics is a long way from this ideal.

3. **What is the relative use of different transport modes?**

   Few governments are satisfied with the existing freight modal split. Most aim to alter the allocation of freight between modes to relieve congestion on one or more infrastructures, reduce the environmental impact of freight movement and / or correct what is deemed to be a market failure. In the absence of freight data disaggregated by mode it is not possible to assess the scale of the problem and the potential for effecting a modal shift.

4. **How efficiently is freight being transported?**

Where freight transport costs are higher as a result of inefficient operation, prices throughout the economy are inflated and business competitiveness impaired. Structural processes likely to promote economic development, such as the expansion of market areas and centralisation of production and inventory, are inhibited. Inefficient transport operations also tend to be more environmentally damaging. So the level of efficiency needs to measured and the main causes of inefficiency identified and corrected.

The paucity of freight data in many countries suggests that these questions are not being asked. The early stages of policy making must be underpinned by basic statistical knowledge of the freight transport system. NCFRP (2011) suggest that "clarity regarding strategy and desired outcomes" is needed before going on to develop "metrics to gauge the strategy's effectiveness'. An observatory has a critical role at different stages in the policy formulation, implementation and evaluation cycle.

1. At all levels of freight policy making, the main goal must be to improve the performance of the freight transport system. The term "performance" can be defined in different ways in this context, such as transport intensity: the amount of freight transport by each unit of GDP.

2. Modal split: the allocation of freight between transport modes.

3. Market diversity: the portfolio of logistics service available at national, regional and urban levels.

4. Operational efficiency: relating to the utilisation mainly of vehicle capacity, labour and fuel.

5. Service quality: ability to meet customer expectations of transit time, reliability and security.

6. Environmental impact: adverse external effects of logistics activities.

Establishing data collection, analysis and dissemination systems for this wide array of topics will take several years. To build confidence in the observatory and demonstrate its value to government, industry and the wider population, it is desirable to achieve a few 'quick wins'. This would involve concentrating attention and resources on a few priorities areas that are amenable to research and effective policy action.

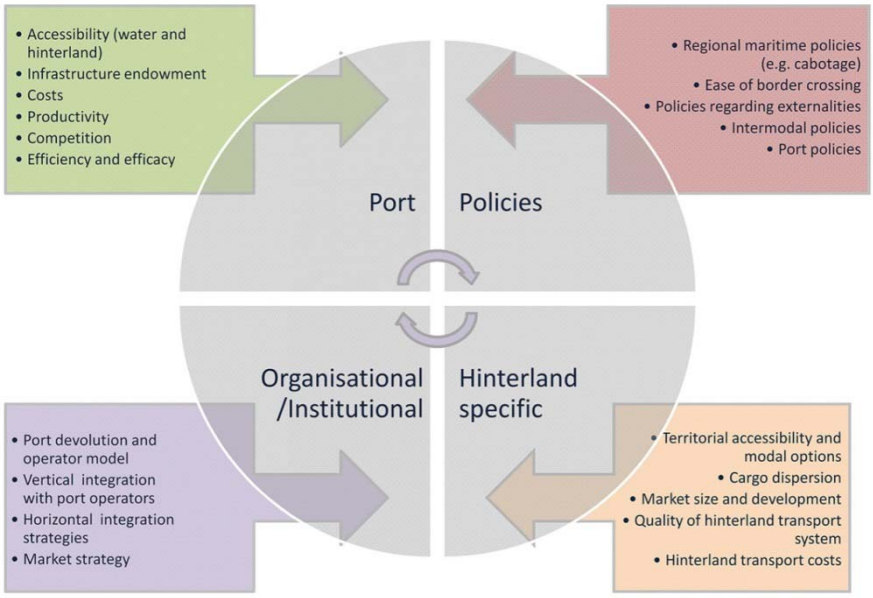
For all of the indicators developed, consistent time series data will be needed to indicate improvement of performance over time. Also, cross sectional data may be required to make relevant comparisons nationally and internationally to benchmark performance where this is considered useful.

Figure 11 summarises the key factors that determine which ports shipping lines call at. This framework can be generalised to broader supply chain performance. Aligning regulatory policies, both landside and maritime, to remove impediments to growing trade, such as inefficient border controls, restrictive cabotage policies and completing national freight transport and logistics strategies are all particularly important factors for global supply chain competition. All four quadrants of the figure require monitoring. A set of Key Performance Indicators (KPIs) need to be established to assess the quality of service from both port operator and government perspectives (ITF, 2015a).

Measuring the performance of a logistics system is a considerable challenge and very much a product of what data a country already collects, and what data it chooses to collect in future. Thinking about ideal KPIs from a government perspective is best done through community consultations with relevant supply chain partners. Many port businesses already measure KPIs to track continuous improvement, but consider sharing their KPIs in public as divulging competitive strategies. That said,

there are already efforts underway by ports and individual partners to develop KPIs that are useful in measuring some parts of the performance of a logistics system, and some KPIs that are already collected globally (such as presented earlier in this report). Some of the indicators are problematic as small countries and large ones are not necessarily good equivalents and a country like Chile, given its geographical features, may not find reasonable comparators.

Figure 11. **Relevant factors in liner network configurations**



Source: Wilmsmeier, 2013.

Examples of areas of measurement

As discussed above, a key role of a logistics observatory is to collect sufficient data on the movement, storage and handling of domestic freight traffic to give public policy makers and relevant businesses an insight into different aspects of logistics. The following discussions lists areas where logistics observatories have been focussing in other countries and which potentially could be of interest also for Chile.

Knowing how much freight is moved within and between regions, broken down by commodity, transport mode and vehicle type is important for infrastructure planning and improved understanding of regional dynamics. It not only benefits transport policy making: it can also support the development of regional development strategies.

In Chile, as in most countries, most of the logistics activity is internal to the country and can be regarded as "domestic". This relates to freight movements with origins and destinations within the country, the storage and handling of products and all the associated information processing. There appears to be less information available in Chile on domestic logistics than on its international flows through the ports. Basic data on the aggregate levels of activity, such as road tonne-kilometres, and on operational efficiency, such as empty running, are seriously lacking. This level of statistical provision is very low by OECD standards and also relative to that prevailing in some other Latin American countries (IADB, 2014). Ironically, tonne-kilometre and tonnage data are available for rail despite the fact that it carries only a very small proportion of the country's freight.

Gateway port performance is a priority in several countries with container dwell times. Data for Chile could gradually be extended to cover hinterland transport services, mirroring developments in Canada and Europe. This diagnostic phase would evolve into periods of consultation and policy formulation, each with additional data demands. In the period following the implementation of any policy, data on a range of port productivity, quality of service and financial metrics would be tracked to assess the policy impacts.

Another area for early attention might by road congestion and its negative impact on logistical efficiency and service quality. In collecting and analysis data on this topic, the observatory could draw upon experience gained in many OECD countries which monitored and researched this phenomenon for many years. A set of transparent indicators could be developed to quantify the impact of congestion on both traffic flows and management of companies' supply chains.

The Urban Mobility indicators developed by the Texas Transportation Institute, although open to criticism and qualification, might provide a model for development in the medium term. In the shorter term monitoring of queuing times at port gates and at border crossings could be considered. Research commissioned by the OECD has also shown how traffic congestion is only one of many interacting causes of unreliability in supply chains (ITF/OECD, 2010). While the starting point for the observatory's work on this topic might be congested transport networks this could evolve into a wider examination of the variability of delivery times within Chilean logistics.

Also of interest has been the mitigation of carbon emissions from logistical activities. Lessons can be learned from many other countries, particularly the UK, the Netherlands and France on the macro-level measurement of CO_2 emissions from freight transport. As McKinnon and Piecyk (2010) point out, there are many different ways of carbon footprinting freight-related emissions, each yielding different estimates and trends. The nature of the calculation is also constrained by the availability of data. It can be done most easily on the basis of fuel sales.

This topic could also be broadened to include emissions of particulates and NOx from freight transport and the related health impacts. The Chilean Freight Vehicle Scrappage Scheme (*Cambia tu Camión*) has been portrayed internationally a successful means of cutting these emissions (GIZ, 2013), but the potential exists to reduce them further through the deployment of a range of other green logistics measures. The planning, promotion and adoption of these measures will require extensive data collection and analysis, core activities for the new observatory.

Warehousing typically represents around a quarter of total logistics costs. It is a major industrial land-use whose character has changed over the past 20 to 30 years as the rotation of inventory has accelerated, materials handling operations have become more mechanised and as the range of activities performed in the warehouse has diversified. A large modern distribution centre can employ over a 1 000 people and make a significant contribution to a local economy.

Warehouse location is also a critical determinant of transport efficiency and is generally fixed in the short to medium term. In most developed countries, inventory has become more centralised in smaller number of larger facilities serving wider catchment areas. Warehouses have also increasingly clustered in logistics parks at points of high accessibility on the road network. A national logistics strategy should try to ensure that these parks are optimally located to serve national and regional markets. They development of such a strategy, however, requires the collection and analysis of data on logistics property trends and changing locational preferences of businesses.

Typically around a third of truck-kilometres are run empty and national statistics for other countries suggest this average can vary from under 20% to over 50%. According to IADB (2014), the proportions

of empty hauls are relatively high across Latin American countries (e.g. Argentina 54%, Uruguay 47%, Brazil 45% and Mexico 38%). It is not known what the corresponding percentage is for Chile or to what extent it might be reduced by initiatives such as supply chain collaboration, the greater use of online load-matching platforms or wider use of "triangulation" by carriers and own account operators. Neither is data available on the partial loading of laden vehicles by weight and by volume.

Several developed countries, particularly in the EU, collect weight-based load data for trucks providing policy makers with an indication of the level of asset utilisation across the truck fleet and informing decisions on the maximum truck size and weight. As demonstrated by the UK, this data can be collected in a way that allows carriers to benchmark their load factors against the mean for their sector or sub-sector. This can help to incentivise 'under-performers' to use their vehicles more intensively.

According to the World Bank[1] approximately 89% of Chile's population lives in town and cities, by comparison with a global average figure of 54%. With such a high degree of urbanisation, the movement of freight within urban areas becomes a critical determinant of both economic efficiency and social welfare. Effectively managing the delivery of freight in urban areas is one of the major logistics challenges of our age. These deliveries are subject to high levels of congestion and access restrictions, characterised by low levels of vehicle utilisation and expose dense populations to high emission levels and a high risk of accidents.

It is hardly surprising that city logistics is attracting a great deal of attention of planners and policy-makers around the world. Many innovative schemes have been devised and trialled, involving, for example, urban consolidation centres, the use of cargo-cycles, night-time and unattended delivery, low emission zones and delivery servicing plans (DSPs) for offices. The logistics observatory could become a repository for information about these schemes and advice city planners on which might be most suited to the Chilean urban environment.

It could also play an important role in monitoring the impact of retail restructuring on last-mile logistics in towns and cities. The growth of online retailing is redefining the interface between personal and freight transport and creating many new forms of delivery within urban localities. In most countries small vans are now the fastest growing category of road traffic, adding to congestion and increasing the energy- and emission-intensity of freight transport. This transformation of the last link in the supply chain, which in Chile as in most other OECD countries is an intra-urban link, impacts directly on the lives of much of the population making it as much of a quality of life as a logistics efficiency issue.

While international transport is almost entirely outsourced to logistics service providers, much domestic distribution remains in the hands of own account operators, i.e. companies such as manufacturers and retailers that internalise some or all of their logistics activities. The level and nature of logistics outsourcing would also merit the attention of the logistics observatory as they have a major influence on the evolution of the national logistics market.

Surveys (Cap Gemini et al, 2014) have revealed that the percentage of national logistics expenditure that is outsourced varies widely between countries, as does the extent to which specific logistics activities are contracted out. Different sectors also differ in their propensity to outsource logistics activities. The division of responsibility for logistics in a national market between own account and third-party logistics providers (3PL) is one of the core issues that an observatory should be addressing. The

[1] http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS

degree of 3PL penetration is partly a function of the diversity and maturity of a country's logistics sector, something that could be regularly monitored in a rapidly developing country such as Chile.

The above discussion highlights several possible areas for the development of Key Performance Indicators in Chile. The development of appropriate KPIs via stakeholder consultation in the process of developing its logistics and freight policies was recommended by the earlier ITF study on port investment and container shipping markets (ITF, 2015a). As a follow-up, the Ministry of Transport and Telecommunications of Chile organised a stakeholder meeting to discuss Key Performance Indicators and a potential implementation plan for a logistics observatory in December 2014.

A logistics observatory for Chile

A logistics observatory has a potential to strengthen decision making, help create trust in the data and analysis produced and promote dialogue among stakeholders. A logistics observatory can help government to develop a strong logistics strategy based on empirical and reliable data. A review of international experiences of logistics observatories revealed several reasons for failures while also suggesting several success factors. The key is to have clear policy questions leading to strong and meaningful objectives and a direct connection between indicators and actionable policies. Being able to show results in terms of policy impact creates trust and increases the observatory's influence.

This requires an understanding of the factors affecting current logistics performance in Chile which is constrained by the lack of data. This chapter summarises the results of the workshop organised with international and national logistics experts in Chile on 2-4 December 2014 and provides recommendations of the ITF review team for the development of Chile's logistics observatory. As a starting point, the workshop participants identified as the underpinning objective for the Chilean observatory to provide evidence for fact-based decision making – both *ex ante* and *ex post*.

Quantitative data is one of the cornerstones on which an observatory should be built, but its reach should be broader in order to have a value add compared to a national statistics agency. While the division of responsibilities for data collection between both entities can vary according to national preferences and policies, the observatory's contribution to improving logistics comes from its ability to translate data into information for decision makers, help shape the debate by injecting evidence-based arguments to it and actively recommend policy actions and operational strategies to stakeholders in both the public and private sectors based on leading-edge research and insightful analysis.

The following summarises recommendations by the ITF review team in terms of objectives and key data requirements.

Key objectives

The success of observatories depends on the ability to create mutual understanding across multiple stakeholders of the shared information requirements for improving logistics performance. It is important, however, to keep in mind that information alone will not help improve logistics performance. Rather, information can help provide facts that contribute to the decision making process and, ultimately, it is those decisions that will improve or not the performance of the logistics chain. Thus, there must be a clear link with the information that is gathered and both the authority and the will to act upon it. The ITF review team, considering Chilean stakeholders' opinions, proposes the following set of key objectives for the logistics observatory:

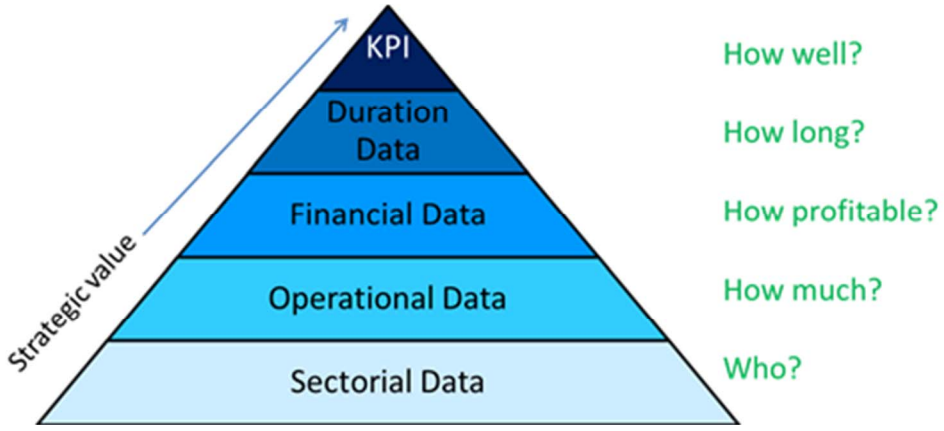
- To collect, pool and disseminate high-quality and objective data on the Chilean logistics sector.
- To produce meaningful, value-added, analysis and research on the key issues related to logistics in Chile.
- Build dialogue between the public and private sectors on the economic and environmental challenges facing the country's logistics sector.

- Raise the awareness on logistics sector and improve its public image.

Key data requirements

The observatory should take a top-to-bottom approach to the knowledge pyramid presented in Figure 12, whereas national statistical agencies should take a bottom-up approach with the delineating line being where the national statistical agency determines that this data is incompatible with its service delivery model. The end result for the observatory is to be able to complete the entire pyramid, either in cooperation with other agencies or on its own.

Figure 12. **The knowledge pyramid**



Sectorial data

The key starting point is the sectorial knowledge. This is first and foremost a measure of stock. Be it stock of transportation companies, stock of fleet or stock of infrastructure. This combines a national business registry with a national fleet survey and a national infrastructure inventory.

The ITF review team and Chilean stakeholders identified the following priority data elements under the sectorial data tier:

- Characteristics of industries involved in supply chains;
  - Firm count
  - Firm size (employment, revenues)
  - Firm location
  - Vehicle fleet (mode, type, number of units, age)
  - Governance and ownership
  - Contribution to GDP

- Characteristics of the labour supply
  - Employment by profession
  - Employment by mode
  - Employment location
  - Skills set
  - Educational programs

  - Remuneration

- Infrastructure inventory
  - Length of roads, railways, capacity of ports and airports
  - Warehousing and storage capacity
  - Geo-localisation of all transportation and logistics infrastructure
  - Age and state of repair of infrastructure

Operational data

Once the stock of Chile's transportation assets has been adequately established, the observatory will be tasked with measuring transportation demand. This will enable policy makers to better understand how freight flows in Chile. The ITF review team and Chilean stakeholders identified the following priority data elements under the operational data tier:

- Freight origin, destination and routing (including mode and transfer points).
- Freight tonnage, tonne-km and value.
- Commodity description, as expressed through a harmonised code (HS Code for example) or other commodity classification in order to understand what is carried.
- Energy consumption.

Financial data

The goal of any logistics business is not only to move freight but to move freight profitably. From a policy perspective, two questions usually arise: First, is the transport sector cost competitive and second is the transport sector financially viable. It therefore could become important for the observatory to be able to analyse both the cost competitiveness and the profitability of the sector to make sure it is viable while at the same time monitoring freight rates to ensure Chile's competitiveness in global value chains. The ITF review team and Chilean stakeholders identified the following priority data elements under the financial data tier:

- Freight and logistics' services rates, for example by conducting regular surveys on freight rates or by putting additional emphasis on transportation in existing inflation surveys.
- Survey on total logistics costs including transportation rates, warehousing, inventory carrying, administrative costs and negative externalities.
- Financial statements from logistics companies, including detailed cost breakdowns.
- Data on taxes, licences and fees paid by logistics companies.

Duration data

A fundamental question in supply chain management, even before cost, is time. How long will goods take to get from shipper to consignee? How long will goods take to get to market? How long before goods clear customs? How reliable is the schedule? Firms have clearly and repeatedly shown willingness and an ability to pay, when necessary, to achieve a desired length and reliability of their supply chains. The ITF review team and Chilean stakeholders identified the following priority data elements under the duration data tier:

- Measuring the time goods take to travel between two nodes in the supply chain, by collecting time stamp data at point of arrival, final destination and strategic intermediary points (intermodal transfer node, customs inspection, etc.). This could be done for key commodities, especially if they are time-sensitive, such as fruits or fresh fish and can be done through a sampling approach if complete census data is not readily available.
- Measure delays in the supply chain caused by unforeseen incidents (natural disasters, strikes) to either develop a supply chain resiliency strategy or provide the necessary factual data and analysis to support which ever organisation will be tasked with such a responsibility.

KPI data

While other data only provide factual, quantitative information, KPI provide qualitative information in that it enables policy makers to evaluate how well Chile's supply chain is performing and identify gaps that require a closer attention. KPIs help diagnose a problem while the solution lies in the first four data tiers. To develop KPIs, the observatory and its leadership will have to identify operational objectives for Chile's logistics sector. These could be articulated, for example around total delivery time, cost competitiveness, maximising asset utilisation and minimising idling periods within the supply chain. The ITF review team and Chilean stakeholders identified the following priority data elements under the KPI data tier: productivity (labour, assets); total transit time between strategic points (i.e. from a warehouse to a port); cost per tonne-km; vehicle-km per year; port dwell time; benchmarking against logistics leaders and Chile's competitors; user perceptions and on-time performance.

Risks

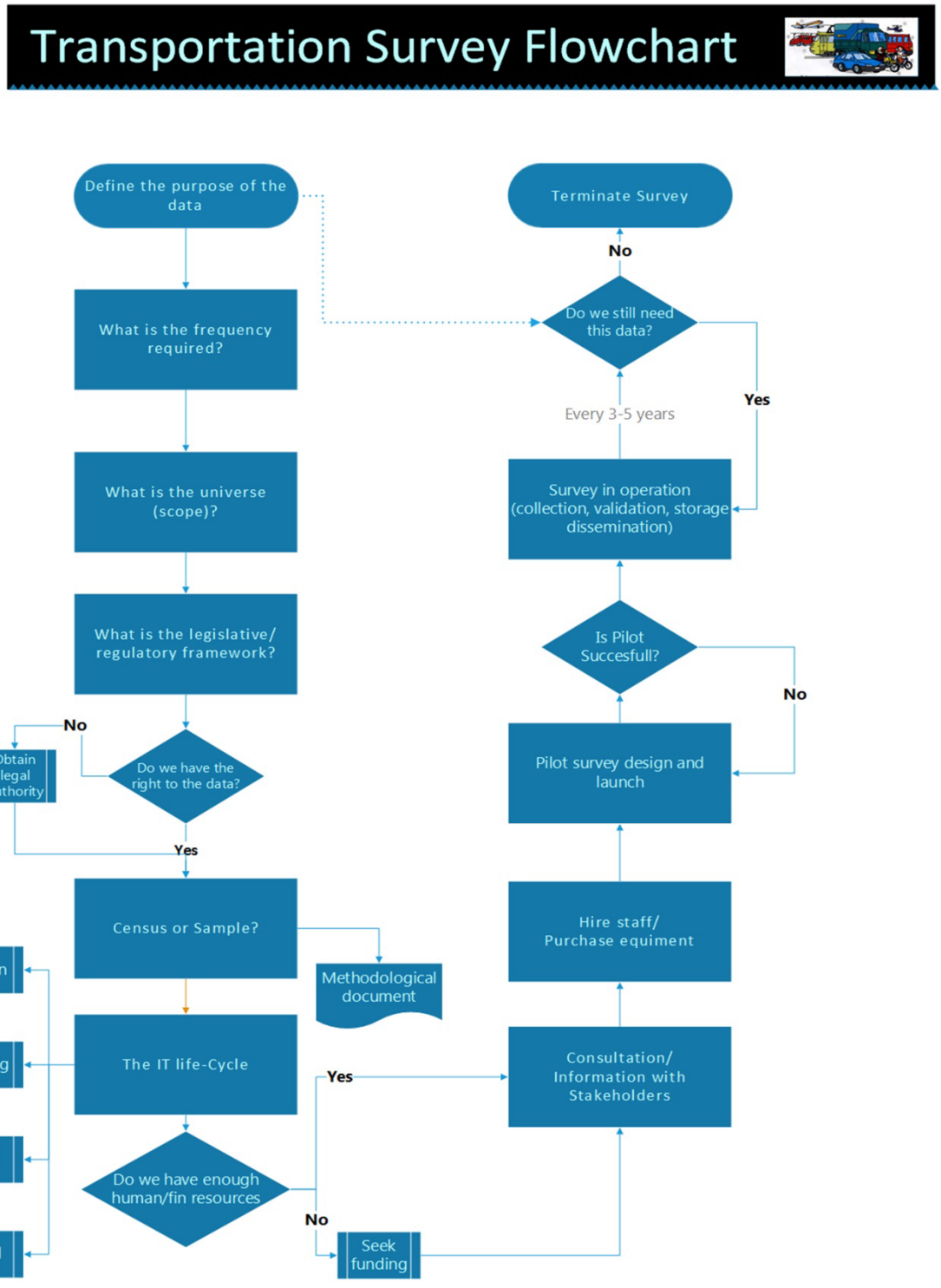
Obviously, it is not necessary to obtain all the data elements listed above for the observatory to be a success. Nor is it necessary for all levels of the pyramid have data to support it. Here, we must return to the policy questions which will be driving what the observatory aims to achieve. For example, if there is no policy interest in the financial viability of the sector, or if this information already exists elsewhere, then the third level of the pyramid may be completely disregarded. However, if one of the policy questions relates to employment in the Chilean transportation sector, then at least some of the employment data listed under the sectorial data level of the pyramid will have to be obtained in order to address the policy question.

Methodology

Having decided on what performance metrics are to be collected, it would then be important for each one to develop a sound methodological foundation for how the raw data will be collected, manipulated and transformed into a meaningful output. To do so, there must first be a decision on which policy tools are available to respond to a given metric. In some cases, decision makers may want or need micro-data in order to have the ability to make precise surgical policy strikes, while in other cases, what is warranted is a more macro-data approach. To help observatory methodologists best determine the survey methodological approach, the following flowchart shows the major steps involved in designing any type of survey. The key issues are usually:

- What is the purpose?
- How will we get the data?
- Do we have the right to collect this data?
- Do we have the resources to collect this data?

Figure 13. **Flowchart of survey development**



A key factor determining the success of a data collection program is the manner in which data is collected. The following table shows different forms of data collection and their respective strengths and weakness:

Table 2. **Strengths and weakness of data collection methods**

	Paper-based (manuscript)	Web-based data entry	Spreadsheet upload	B2G data transfer
Cost (small data)				
Cost (large data)				
Precision				
Real-time				
Accessible to all				
Training				

Strong | Can have issues | Weak

A centre of excellence in logistics data

The observatory should develop robust statistical and analytical methodologies in collaboration with international and national experts. In order to evaluate the impact of logistics sector on social and economic development, the logistics observatory needs to be able to access and disseminate meaningful sectorial, operational, financial and duration data as well as develop KPIs to track the competitiveness of freight transport services and logistics operations in Chile.

The International Transport Forum at the OECD provides an arena for statisticians to discuss methodological issues and share best practices in collecting freight related statistics. The review team strongly recommends that a representative of the observatory or the Ministry of Transport and Telecommunications join the ITF's annual statistics meetings and the network of transport statistician around to world. This would enable discussion and exchange of information on best practices for the collection and analysis of key freight statistics and KPIs.

Indeed, knowledge should not be developed in isolation and Chile has an opportunity to learn lessons from the establishment of logistics observatories elsewhere. To be successful, an observatory should collaborate with organisations within the country and elsewhere. The review team identified several stakeholders that should be approached, under the leadership of the Ministry of Transport and Communications, including public sector (INE, Ministry of Economy, Ministry of Finance, Ministry of Public Works, etc.), private sector (transport and logistics providers, ports, enablers and users), international organisations (ITF, OECD, ECLAC), international financial institutions (IADB, WB), academia and professional associations (such as CSCMP, CILT and BVL).

For the collection of basic freight transport data, to achieve the necessary response rate in freight transport surveys, especially in the highly fragmented road sector, participation will have to be mandatory and that probably requires Ministerial control. The data collection process must be carefully managed to:

- Minimise the burden on operators.
- Convince them of the need for the data.
- Assure them that confidentiality will be observed.
- Give them access to the aggregated results.

Experience elsewhere suggests that operators often value the inclusion of a benchmarking service in the data collection process. This can be used as a 'sweetener' in the collection of some types of freight data.

Box 3. To regulate or not to regulate

Publicly-mandated statistical programs around the world face one common question, no matter the type of data being requested, the sector that it covers or the uses for it: Collect on a mandatory or voluntary basis?

The case for mandatory data collection

Mandatory data collection, through regulation or legislation, is best used for recurrent, periodic surveys on very specific topic. The use of enforceable regulations can prevent situations where time-series can't be performed because of a highly volatile or degrading response rate. Regulated data collection though must be properly defined in order to obtain a legitimate data collection mandate and not simply a "blank cheque". This creates certain rigidities to the process but also certain predictabilities and can help drive down reporting costs as survey respondents will incorporate this activity in their normal operations. However, mandatory data collection in inherently authoritarian, and if not properly enforced, can invite abuse and indifference from survey respondents. Finally, the mandatory nature of data reporting opens the very real possibility that the observatory could collect data in the long run that is no longer required simply because it always has and it's the law.

The case for voluntary data collection

Voluntary data collection is inherently of interest to survey respondents as they would only supply data if they were interested in the aggregate. It may be costlier if done on ad-hoc basis which could lower response rates. Low or fluctuating response rates would also require significant statistical manipulation in order to obtain consistent time series and properly monitor the evolution of the metric over time. Voluntary data reporting creates a feeling of goodwill towards the agency collecting the data but could also create indifference if survey respondents make the bet that they could obtain just as good aggregate if all stakeholders but themselves submitted data. This type of game would end up as a result that no one would submit any data.

A variable geometry approach

Both approaches present some merits and the decision to take a voluntary or mandatory approach to data collection should be taken on a case-by-case basis. Nonetheless, mandatory data collection should be favoured when:

- There is a need for a long term consistent time series.
- There are a high number of respondents.
- There is a history of low response within a sector.
- The incentive for voluntary reporting is too weak to expect high enough response rates.

Core logistics observatory capabilities include data collection, validation, analysis, dissemination and benchmarking. Longer established logistics observatories around the world have a wide range of activities, including information pooling and synthesis, publication of flagship reports, research, organisation of public events and provision of advice on specific policy questions. They provide a useful model for the Chilean observatory to follow.

The observatory may want to cooperate with logistics firms and academia but for two very different purposes. Cooperation with firms would be in order to more readily obtain required data as well as understanding the implications of the data and the causes of any change in the data. Cooperation with academia could help provide a stronger scientific base and better share experiences from other parts of the world, through regular exchanges between academics.

A centre of excellence in logistics analysis and research

Once established as a centre of excellence for data, the observatory will have to translate this timely and pertinent data into information. The observatory should launch a research and analysis program, accompanied by a clear and ambitious communication plan to disseminate information about logistics in Chile. Information to be disseminated should develop robust statistical and analytical methodologies in collaboration with international and national experts. In order to better disseminate information to policy decision makers and industry stakeholders, the ITF Review team proposes the following three-stream structure:

Stream A: Periodical publications

The observatory will publish a quarterly information bulletin presenting main supply chain data in Chile. This should include metrics from all 5-tiers of the knowledge pyramid and very succinct analysis. The goal of this publication is to present in quasi-real time the current state of logistics in Chile.

Stream B: Ad-hoc analysis and research

The observatory will develop an in-house capacity to answer key policy questions coming from decision makers either within the Chilean government or from the private sector. These specific questions will reflect the significant issues of the day and require a relatively quick turnaround.

Stream C: Planned analysis and research

The observatory could be instructed to produce analysis and research on specific issues related to logistics. This long-term research can be conducted in-house, or in cooperation with academia or private consultancy. The planned nature of these research projects will allow the observatory to manage resources in a more predictable fashion. Results of this research and other logistics research conducted in Chile outside of the observatory framework can be presented at an annual Chilean Logistics conference organised by the observatory. The observatory should also be strongly encouraged to present its work outside of Chile, including at major transportation research conferences (i.e. TRB, TRA) and the ITF's annual summit.

A hub for logistics dialogue in Chile

Global supply chains are increasingly complex requiring the support of many stakeholders across a broad spectrum of the industry to come together in a concerted way. While it is clear that the observatory's mandate does not extend to managing supply chains, through its data collection efforts and

research endeavours it can help foster a dialogue between logistics practitioners and regulators, to achieve a common goal of a more competitive logistics environment for Chile.

In addition to organising a yearly conference on logistics analysis and research (see above), the observatory should also assemble a panel of Chilean logistics leaders to regularly meet, discuss and formulate solutions to Chile's logistics challenges of the day. The role of the observatory in this context would be to act as a facilitator and offer a neutral venue where innovative logistics ideas could be discussed. As well, it can interject its own research and analysis in the discussion, thus positively contributing to improving Chile's competitiveness.

An observatory at the service of the people of Chile

As the observatory grows over time, it is important that it always maintains a strong link with its origins, which was to help the MTT deliver a more competitive logistics environment for Chile. As such, the observatory should practice a policy of complete transparency with the MTT as the lead ministry for transportation matters within Chile. As such, the observatory should not engage in any activity where it would be unable to share the data or the results of the analysis with the MTT unless this is done with the approval of the MTT and that the analysis of the data be made available to MTT. However, as a default position, all data and analysis held by the observatory should be made available to the MTT upon demand.

In summary, key messages to note here are, first, that the observatory must have the legal right, the technical ability and the resources to acquire, store and disseminate all data elements in the knowledge pyramid. Secondly, the Observatory will develop a world-class transportation statistics program, built on both mandatory and voluntary reporting, in cooperation with key Chilean and international stakeholders which will enable Chile to leap-frog to the ranks global leaders in transportation statistics. Thirdly, the observatory will develop a communication strategy to disseminate periodical and long-term logistics research and analysis, both in Chile and in international fora. Finally, the observatory will establish, and act as, a secretariat to a panel of Chilean logistics leaders.

Implementation

International experiences show that financial sustainability is one of the key challenges for logistics observatories (Kauppila, 2014) and this requires a well-defined business plan. Strong governance and leadership, combined with good technical capability from a core team and stable, long-term funding are critical. Support from government agencies and a political commitment is essential for the legitimacy of the work. Continuity in support for planning and policy making is important, especially in a political context in which the turnover of senior level decision-makers is high.

It is also important to preserve the independence of the observatory by installing sound governance. Its integrity would be undermined if it were to be perceived merely as a channel for publicising public policy successes.

The observatory should not replace government functions, nor should it divert scarce resources away from government and ministries. It should build on existing data collection systems and structures and not replace those who already have legitimate roles and duties.

Public-private partnerships are being increasingly explored as an alternative way to institutionalise and finance logistics observatories. Once a common sense of ownership has been established, logistics initiatives are more likely to endure and deliver their expected benefits. This also reduces the observatory's dependency on government funding alone. The private sector will also be the main source of statistical data for the observatory and so they must be motivated to provide this vital support.

The following summarises ITF review team recommendations in terms of implementing and resourcing the observatory.

Phased implementation plan

ITF review team proposes a phased approach for the Ministry of Transport and Telecommunications (MTT) implementing the logistics observatory in Chile. The Inter-American Development Bank guidelines for the design and establishment of national observatories for freight transport and logistics is a useful practical document for preparing a more detailed institutional design and creating a work plan (BID, 2013).

Phase 1 (0-6 months)

- MTT takes leadership, building on the existing initiative to define and clarify the objectives and strategy of the observatory.
- MTT seeks government-wide mandate to implement the observatory and secure government funding to cover the Logistics Observatory's needs until the end of Year 5.
- Detailed consultation with private sector on its contributions and requirements.
- MTT names a dedicated Logistics Observatory Director with the task of drafting:
  - An observatory strategy setting out the objectives;
  - A business plan identifying short, medium and long term projects;
  - A work plan and an institutional agenda.

- Conduct a needs analysis matrix, establishing where the data gaps exist, their level of priority and the ease to fill the gap.
- A representative of the observatory takes part in the ITF Statistical working group meetings.

Phase 2 (6-12 months)

- Build on the existing MTT data portal to consolidate all existing freight transportation and supply chain data available in Chile.
- Create the legal framework to operate the observatory as an independent body.
- Initial staffing of the observatory.
- Conduct an inventory of all logistics data available in Chile to better identify gaps that require the observatory's attention.
- Develop a communication plan which includes a strong brand and social media presence.

Phase 3 (1-2 years)

- Launch the first observatory project, targeting a data gap that is both high priority and easy to obtain.
- Depending on the nature of the project and its data intensity, it may be necessary to set-up a small Information Management and Information Technology (IM/IT) unit. However, this should only be decided once a proper assessment has been made of the data needs of the observatory.
- Build a network of like-minded stakeholders, including with academia, neighbouring countries, logistics leaders and international organisations to form a logistics leaders roundtable. This informal network would not be part of the governance of the observatory, but rather it will provide a forum to share ideas and find common solutions to common challenges. It will also provide a forum in which to discuss current logistics issues in Chile, thus encouraging dialogue between the many stakeholders.
- Implement the communication plan.
- Establish a mechanism to conduct a 5-year review of plans and priorities, thus ensuring that the work carried out by the Logistics Observatory remains aligned with the priorities of the Ministry of Transport and Telecommunications.

Phase 4 (2-4 years)

- Launch new projects building on the success of the first project.
- Hold an event (workshop/conference) on logistics performance in Chile.
- Make use of all modern communication tools in disseminating information about the work carried out by the observatory.
- Represent Chile in international meetings looking at logistics performance and logistics data.

Phase 5 (4-5 years)

- Establish a sustainable funding scheme that includes contributions from the private sector.
- Ensure the sustainability of the observatory through meaningful and relevant (mainly outsourced) projects and secure funding.
- Hold a second workshop on logistics competitiveness in Chile
- Define and execute the first 5-year review of the observatory and take stock of the accomplishments to date.

The following table provides an indicative overview of resources the observatory will require over its first five-year cycle. The amount of staff allocated for major projects, such as survey or research project are purely indicative and may need to be revised depending on the complexity of the project.

Table 3. **Indicative resource plan**

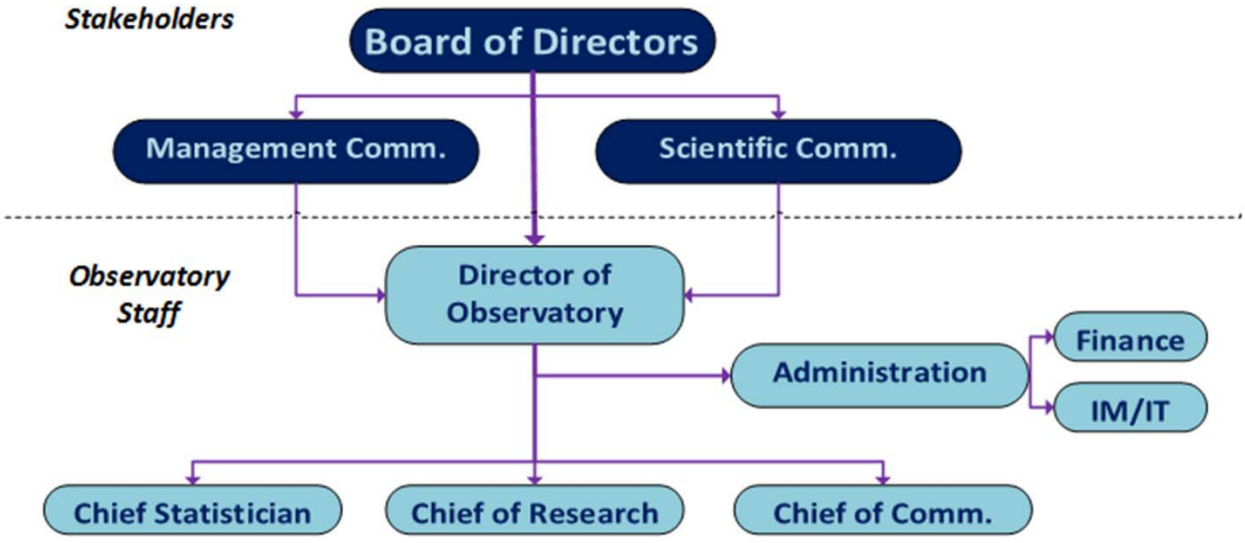
	Resources	**Phase I**		**Phase II**		**Phase III**		**Phase IV**		**Phase V**
Task↓ Month →		0-3	4-6	7-9	10-12	13-18	19-24	25-36	37-48	49-60
Establish Mandate	0.5 (MTT)									
Establish Governance - Establish initial Board of Directors - Define powers and limitations of Director - Establish staff rules of conduct	0.5 (MTT)									
Hire Director	0.5 (MTT)									
Day-to-day observatory management	0.25									
Observatory legal framework - Establish obs. as independent entity - Create initial rules, bylaws of organisation - Define legislative, regulatory amendments required to launch data collection program	0.5									
Hire initial staff	0.25									
Establish/maintain a logistics leaders roundtable	0.25									
Communication plan, branding, web	1.5									
Logistics data inventory	1									
Identify and address top priority data gap	2									
Day-to-day managem't of first survey	1									
Launch first research project	2									
First workshop	2.5									
Dissemination, web, social media	1									
Launch second data survey	2									
Launch second research project	2									
Second workshop	2[1]									
Five-year review	0.5									
Total staff	MTT Observatory	1 0	1.5 0.25	0 1	0 3.5	0 3.5	0 4	0 8	0 9	0 9

1. Presume a 0.5 FTE gain in efficiency

Governance

The governance of the observatory is proposed to be composed of three bodies: A Board of Directors made-up of high public and private stakeholders (i.e. Minister/CEO level), a Management Committee to oversee the day-to-day management of the observatory, and a Technical Committee to review the content of the output produced by the observatory. The observatory is proposed to have a Director, appointed for a fix term (3 to 5 years, renewable) by the Board of Directors.

Figure 14. **Indicative governance structure of the observatory**



Board of Directors

The Board of Directors could be composed of 12 to 15 members representing the public sector, private sector and civil society with care being taken that the Board represents all modes of transport and all major types of stakeholders within the logistics chain. It is expected that membership to the Board be reserved only to the senior-most officials (Minister, State Secretary, C-level executives, VP) and represent the top logistics leadership in Chile.

It is proposed that each Board Member has one vote and that no organisation has more than one Board Member. As long as the Government of Chile provides over 50% of funding for the observatory, the Board Member representing the MTT should also hold a veto power. There would also be value in having one outside observer sit on the Board of Directors with no voting rights.

Board members should represent a cross-section of the Chilean logistics sector and include representation from the MTT, academia, an airport or airline, a port, a railway company, a trucking firm, some major shippers from various key sectors, a representative from the warehousing industry, a chamber of commerce and union representation. Board members need not pay to sit on the Board and need not come from stakeholders who have financially contributed to the observatory. Nominations should be for a distinguished individual leader and not for a company who could delegate a person of their choosing. Finally, the observatory should reimburse Board members for reasonable travel and other expenses, subject to clear rules based on the Government of Chile's travel expenditure reimbursement policies.

Management Committee

The Management Committee should be a reflection of the composition of the Board of Directors and be able to make decisions in its name to a degree of delegated authority as prescribed by the Board. This Committee should be staffed at the VP, Director General or Director level from organisations who are also members of the Board. It is the Management committee that approves all financial and human resources decisions, except where it has delegated that authority to the Director. The Management Committee also decides on the projects to be undertaken by the observatory. Finally, the Management Committee nominates members of the Scientific Committee, after consultation with the Board of Directors, and may decide by a majority vote to exclude an organisation from the Scientific Committee if it judges the presence of that organisation to be contrary to the objectives of the observatory.

Scientific Committee

The Scientific Committee is open to representatives from any organisation with an interest in logistics in Chile. Members are named by the Management Committee. This includes organisations part of the Board, organisations that finance the observatory, organisations with no other commitment to the observatory, academics and international organisations. The role of the Scientific Committee is to meet on a regular basis and review the work underway by the observatory. It is also expected that committee members support the work of the observatory by providing information or other assistance when appropriate. The Scientific Committee may also be asked to take part in evaluating bids for contracted research and thus would have to develop a framework to prevent conflicts of interest, real or perceived, from emerging.

Roles and Responsibilities

The following RACI (Responsible, Accountable, Consulted, Informed) matrix proposes the roles and responsibilities for each group for the main activities of the observatory. While the table is purely indicative, these roles and responsibilities should be clearly laid-out in the bylaws of the observatory. These bylaws will provide all stakeholders and staff involved with the observatory with clear and transparent guidelines.

Table 4. **A proposal for logistics observatory RACI matrix**

Task	BoD	Mgmt Comm	Sci. Comm.	Director	Admin	Chief Stats	Chief Research	Chief Comms
Nominate Board members	R							
Nominate Mgmt Comm	R	I	I	I				
Nominate Sci Comm.	C	R	I	I				
Hire Director	A	R	C					
Hire Staff	I	I	I	R	I			
Establish levels of delegation of authority	A	R	C	I	I			
Financial and HR management[1]	A	A	C	A	R	C	C	C
Establish and manage the appropriate IM/IT architecture	A	A	C	A	R	C	C	C
Manage data collection program	I	C	C	A	I	R	C	I
Manage research projects/ Reports	I	C	C	A	I	C	R	I
Observatory events/ Conferences	I	C	C	A	I	C	R	C
Disseminate Information	I	C	C	A	I	C	C	R

1. Accountability for HR and Financial management a function of the level of delegated authority established by the Board of Directors

A Accountable R Responsible C Consulted I Informed

Staffing

Initially the observatory is proposed to be staffed by the Director, hired by the Board of Directors as a result of a merit-based competition. The Director could be mandated to hire one administrative assistant and the Chief Statistician to develop the Statistics program. Implementing this program may require additional staffing under the Chief Statistician. As data starts being produced, the positions of Chief of Research and Chief of Communications will likely need to be staffed as well as subordinate staff to support their work. Staffing should be done in a gradual and incremental basis to provide the observatory with maximum flexibility while ensuring financial resources are well allocated (see Table 2).

Financing

The observatory is proposed to be initially financed solely by MTT using dedicated and predictable funding to that effect. As the observatory starts to accumulate success, the funding model should shift to a more hybrid one between the public and private sector with eventually the private sector accounting for most (over 50%) of the financing. Long-term public funding through MTT should include a scheme of diminishing financing over time with a set target after 5 years. This will force the observatory to deliver value for money for the private sector to justify its financial sustainability or transform itself into something far less ambitious.

To off-set the risk of the MTT loosing access to the data, information and analysis produced by the observatory and in recognition of the founding role it played and the initial financing it provided, its bylaws should include clear provisions providing full and unfettered access to MTT. In addition, the MTT should be allowed to grant the observatory funded mandates to study issues of interest to the Ministry and which would be outside the observatory's program of work. The observatory should only charge marginal costs to the MTT.

The financial base of the observatory should be predictable, stable and recurrent. In addition, the observatory should take on research projects on a supplementary contribution basis and seek private sector partners to contribute to its finances. The observatory should also have the ability to access funding outside of Chile (i.e. research grants) to finance projects that may help sustain and improve Chile's logistics competitiveness.

Mandatory review

The Chile Logistics Observatory should be subject to mandatory 5-year review enshrined in its by-laws to ensure that its goals are still in keeping with MTT's and the private sector and provide an opportunity to deliver better value for money. The review could be conducted by a term employee acting as a consultant and reporting directly to the Board of Directors. As part of the review, the consultant will be strongly encouraged to keep abreast of developments in other logistics observatories around the world, ensuring that Chile's remains a world-class leader, both for the value of the work it carries out and for its governance structure.

The review should be done on a zero-base budgeting, meaning that it should provide an opportunity to redesign the entire organisation, its activities and its mandate from top to bottom. This process would ensure that the work of the observatory remains relevant for public and private stakeholders alike. The review should be entirely funded by MTT during year 4 of the 5-year cycle and should not impact the operating budget of the observatory during the review period.

Conclusions

As an open economy, Chile relies heavily on trade for its economic growth. Lower transport and logistics costs as well as effective coordination between operators and public and private sector would improve Chile's competitiveness, boost exports and diversify production and trade patterns. The ITF review team identified a significant data gap in Chile. A logistics observatory is a useful vehicle to advance collection and development of such data and ultimately to prepare national freight transport and logistics strategies. It would strengthen decision making through evidence-based policy support.

The ITF review team recommends the Ministry of Transport and Telecommunications takes leadership in implementing the logistics observatory in Chile in partnership with the private sector. This would serve policy through regular data collection, analysis, research and creating for a for logistics practitioners to exchange best practices, address emerging logistics issues and ultimately strengthen Chile's competitiveness.

Expert biographies

Pablo GUERRERO is Senior Transport Specialist at the Inter-American Development Bank (IDB) and has over 12 years' experience in the field of transport infrastructure, freight transport, public works, public policy and urban development. Mr. Guerrero is involved in the evaluation, preparation and management of investment portfolio and technical assistance operations in Bolivia, Brazil, Central America, Chile, Colombia, Dominican Republic, Ecuador, Mexico, Paraguay, Peru, and Suriname at national, provincial and municipal level. Mr. Guerrero is responsible for preparing financial and nonfinancial projects on logistics and freight transport, transport infrastructure, rail infrastructure, urban development and sustainable transport policies.

Mr. Guerrero is involved in coordinating the IDB's strategic are of freight logistics. Among the projects that he is leading are loans for technical assistance, public policy and institutional strengthening for public sector agencies related to road transport and freight logistics, developing a network of national and regional observatories for freight transport and logistics and developing a methodology to estimate the impact of congestion on city logistics. Prior to joining the IDB he worked at the World Bank and private consulting firms in the field of transport infrastructure.

Willem HEEREN is the Chairman of the Executive Board of TKI-DINALOG- Dutch Institute of Advanced Logistics. In addition, Mr Heeren is the Chair of the Export platform of the Ministry of Infrastructure and Environment, Member of the Dutch Trade and Investment Board, Logistics Advisor for the Ministry of Transport and Communication of Oman, Chairman of theTaskforce Logistics Agenda Brabant (2nd largest province in Netherlands), Member (for Logistics) of Strategic Board Delta Region.(region between Rotterdam and Antwerp.).

Prior to joining TKI-DINALOG, Mr. Heeren worked for Exxon in Europe and the United States from 1973-1994, where he was active in various management functions in engineering, operations and supply and logistics. From 1994-2010 Mr. Heeren was the CEO of JandeRijk Logistics and currently serving as Chairman of the Board of this logistics company. In the past he was also President of Royal Dutch transport Association (KNV), Vice President of TLN, Branch Organization of Transport and Logistcs Netherlands, Member of Supervisory Board Netherlands Distibution Land (NDL).

Alan McKINNON is Professor of Logistics in the Kühne Logistics University in Hamburg. He has been researching and teaching in freight transport/logistics for over 35 years, has published extensively in journals and books and been an adviser to several governments, parliamentary committees and international organisations. He has conducted over fifty studies for numerous public and private sector organisations, published extensively in the logistics and transport literature and generally supported the development of logistics as an academic discipline.

Prior to joining Kühne Logistics University in 2012, Professor McKinnon lectured and researched in economic geography and transport at the University of Leicester and at Heriot-Watt University in Edinburgh. During his time at Heriot-Watt he established a research center specializing in logistics and a master's program in logistics and supply chain management. In 2010 he was appointed chairman of the World Economic Forum's industry council on logistics and supply chain management. In 2012 he was

one of two academics appointed to the High Level Group on Logistics established by the European Commission to advise the EU Transport Commissioner on logistics issues. Professor McKinnon has an MA degree in geography from the University of Aberdeen, an MSc in transportation studies from the University of British Columbia and a PhD from the University of London.

Gordon WILMSMEIER is Economic Affairs Officer in the Infrastructure Services Unit at the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC). He is an internationally recognized expert in the geography of maritime transport, port development and inland shipping issues with particular interests in shipping networks, competition, transport costs and energy efficiency. He has published over 100 book chapters, journal papers, institutional publications and working papers. He is member of the International Association of Maritime Economists (IAME), the port performance research network (PPRN), the Sustainability Working Group of the European Freight and Logistics Leaders Forum (F&L), the Transport Working Group of the German Association of Geographers, and PortEconomics.

Dr. Wilmsmeier is an honorary professor for Maritime Geography at the University of Applied Sciences in Bremen and visiting lecturer at Göteborg University, Sweden and Universidad Nacional de San Martín, Argentina. Prior to joining UN-ECLAC, he worked at Edinburgh Napier University's Transport Research Institute (TRI) in Edinburgh, Scotland and as consultant for UN-ECLAC, UNCTAD, UN-OHRLLS, The World Bank, JICA, IDB, CAF, OAS.

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International Transport Forum

Logistics Observatory for Chile
Strengthening Policies for Competitiveness

Chile's economy has made progress over the last 20 years and its per capita income more than doubled during this time to be the highest in Latin America. As an open economy, Chile relies heavily on trade for its economic growth. Well-functioning logistics both domestically and internationally is a necessary precondition of national competitiveness. Lower transport and logistics costs would improve domestic firm's competitiveness, boost exports and diversify production and trade patterns.

A logistics observatory has a potential to strengthen decision-making. Understanding logistics performance is essential for evaluation and determination of transport and trade facilitation policies. A set of Key Performance Indicators are essential to advance these policies. This report was prepared to help the Ministry of Transport and Telecommunications of Chile in developing a statistical centre for freight transport. It identifies the role of the logistics observatory, its Key Performance Indicators and a potential implementation plan. Strong governance and leadership, combined with good technical capability from a core team and stable, long-term funding are critical for the success of the observatory.

This report is part of the International Transport Forum's Case-Specific Policy Analysis series. These are topical studies on specific issues carried out by the ITF in agreement with local institutions.

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