Deloitte.

DP World Australia

Import / Export Supply Chain Cost Analysis

Final Report

10 February 2022

Deloitte Access Economics

Deloitte Access Economics Pty Ltd
ACN 149 633 116
Level 23 Riverside Centre
123 Eagle St
Brisbane QLD 4000 Australia
Phone: +61 7 3308 7000
www.deloitteaccesseconomics.com.au

10 February 2022

Demetra Polycarpou
Head of Legal
DP World Australia Limited

Dear Demetra

Re: Import / Export Supply Chain Cost Analysis – *Final Report*

In accordance with the Engagement Letter signed 10 January 2022 for the provision of an Import / Export Supply Chain Cost Analysis, this *Final Report* provides the findings of analysis of supply chain costs for the cargo owner for representative import / export container journey's through the East Coast ports of Brisbane, Botany (Sydney) and Melbourne. This analysis considers changes in nominal and real cost components across the supply chain over the ten-year period 2012-2021 FY, inclusive.

Restrictions on report use

Deloitte disclaims all liability to any party other than DP World Australia Limited for all costs, loss, damage, and liability that the third party may suffer or incur arising from or relating to or in any way connected with the provision of deliverables to a third party without our written consent. You have agreed that you will not amend the report or distribute the report to outside parties without prior written approval from Deloitte. If others choose to rely on the report in any way they do so entirely at their own risk. Also, the information provided by those we consulted with should be treated as confidential and not be disclosed to any third parties.

Basis of our work

We have based this work on our economic research and analysis of publicly available data as well as our own economic analysis of data provided in confidence by DP World Australia Limited and collected as part of previous engagements. To the extent that these key information and data change, the results of the economic analysis are likely to change. For all enquiries on this report please contact Steve Kanowski

Kind regards,

Steve Kanowski
Partner, Deloitte Access Economics

Contents

Glossary

Term	*Definition*
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
Additional port charges	Additional port charges are levied by shipping lines on cargo owners. These charges are distinctly different from 'blue water' freight charges levied by shipping lines for the physical transportation of containers and are intended to 'pass on' several incidental costs incurred by shipping lines when engaging with the port interface (tonnage, towage, mooring, pilotage, wharfage, stevedore lift-on lift-off charges etc.)
BITRE	Bureau of Infrastructure, Transport and Regional Economics
'Blue water'	Refers to the open ocean – with respect to shipping rates these are the charges for open ocean transportation
CAGR	Compound annual growth rate
Cargo owners	The importer / exporter and ultimate owner of the goods transported in containers. Sometimes referred to as shippers
East Coast ports	East Coast ports are the major capital city ports of Brisbane, Sydney and Melbourne
GP	General purpose container
IMEX	Import and export
Incidental costs	Incidental costs are ancillary costs incurred in fulfilling a primary activity. In the case of shipping lines, these costs include those such as port service providers' charges, wharfage, towage, pilotage etc. and stevedore charges (quayside) incurred by the shipping line in calling at a port to deliver / collect containers
Landside	Refers to the operations of stevedores when interacting with land transport operators
Quayside	Refers to the operations of stevedores when interacting with shipping lines
Real terms	A nominal value rebased to a particular year in order to remove the impact of inflation on nominal prices
Reefer	Refrigerated container
TEU	Twenty-foot equivalent unit. Is a standardised unit of measurement for containers whereby a 20' container equates to 1 TEU and a 40' container equates to 2 TEUs (one Forty-foot equivalent unit - FEU)

Executive summary

Key findings ‘at a glance’

01

Low growth in supply chain costs (pre-COVID)

In recent years, COVID has led to rapid increases in supply chain costs; however, this proceeds a period of low growth in supply chain costs. The recent increases in cost are largely driven by increases in shipping line ‘blue water’ charges.

02

Stevedore charges remain low

Despite recent criticism levied at stevedores over landside pricing, stevedore charges remain a small proportion of total supply chain cost [redacted].

03

Shipping and road transport dominate cost composition

Overall, supply chain costs remain dominated by shipping lines [redacted] and road transport [redacted] Stevedore costs are a very small contribution [redacted] and an even smaller proportion of container value.

[redacted]

Analysis of total supply chain costs over the ten-years to 2021 for both imports and exports highlights a notable increase in total supply chain costs, particularly since 2015 onwards (COVID-19 years).

[redacted]

[redacted]

1. Background and scope

The purpose of this Report is to highlight the movement and magnitude of costs (nominal and real) in various parts of the import / export supply chain at the East Coast ports of Brisbane, Botany and Melbourne

Background

Changes in components of IMEX supply chain costs have and continue to be, a point of contention between supply chain operators, cargo owners and governments. Recent increases in stevedore landside charges have received attention from land-based transport operators and various state governments.

This topic has received attention at both the state and Commonwealth government level from the likes of state transport departments (such as TfNSW, Vic DoT etc.) as well as various competition authorities such as the ACCC. More recently, this includes the recently announced inquiry into Australia's Maritime Logistics System being conducted by the Productivity Commission.

In 2019, Deloitte was commissioned by the Victorian Department of Transport to investigate port pricing and access at the Port of Melbourne (PoM). A key focus of this research was to determine the composition and historical change in components of total supply chain cost at the PoM. In a presentation to industry – which included DPWA – Deloitte highlighted that despite changes to stevedore fee structures at the PoM, the total contribution of stevedores to total supply chain cost for a cargo-owner had remained small and relatively constant over the past ten-years. Furthermore, changes in prices for other supply chain operators were largely responsible for historical increases in total supply chain cost.

DPWA, along with other port stakeholders, are concerned that this situation is not well understood by industry and government as evidenced by criticism levied at DPWA for historical changes to the operator's price structure. DPWA has commissioned Deloitte Access Economics to undertake an updated analysis of IMEX supply chain costs for the three East Coast ports of Brisbane, Botany (Sydney) and Melbourne.

Introduction

The purpose of the analysis outlined in this Report is to highlight the movement and magnitude of costs (nominal and real) in various parts of the import / export supply chain at the East Coast ports of Brisbane, Botany (Sydney) and Melbourne. This Report has been developed for submission to the Productivity Commission's inquiry into Australia's Maritime Logistics System and addresses the scope of works as agreed with DP World and detailed below. The structure of this Report is outlined overleaf.

Scope

The scope of work presented in this Report involved IMEX supply chain cost analysis at Australia's East Coast capital city ports (Brisbane, Sydney and Melbourne) with a particular focus on Port Botany. In conducting the analysis, Deloitte paid attention to the following aspects:

- The real and nominal total supply chain costs for a cargo-owner for 'representative' IMEX containers (agreed in discussions with DPWA) through the ports under investigation over the ten-year period 2012-2021, inclusively;
- The real and nominal change of each component of total supply chain cost (per cent and levels changes) at the Port over the ten-year period 2012-2021, inclusively;
- The percentage contribution of each cost component to total supply chain costs at the Port over the ten-year period 2012-2021, inclusively;
- Any real and nominal cross sections of total supply chain costs that are of interest to DPWA (e.g. 'wharf to port gate' costs);
- Preparation of a report for DPWA summarising the outputs of the analysis and commenting on the scale of the changes in supply chain costs.

This Report considers relevant trends in the import / export freight supply chain as context to historical movements in costs and subsequently, incorporates analyses of both import and export supply chain costs to the cargo-owner over the ten-year period 2012-2021 FY, inclusive

Report outline
The rest of this Report is structured as follows:

02 **Trends in the import / export freight supply chain**
This Chapter outlines an overview of several key trends in the import / export freight supply chain and is intended to provide context to the movements observed in the components of total supply chain cost over time (as analysed in Chapter's 3 and 4). The trends considered in this Chapter are: the increasing conglomeration of shipping lines, historically low profitability of stevedores, trends in increasing road transport costs, port privatisation, vessel sizes and empty container park fees as well as recent developments due to the emergence of COVID-19.

03 **Import supply chain analysis**
This Chapter outlines an analysis of total supply chain cost (nominal and real) for several representative import container journey's at the East Coast port's of Brisbane, Sydney (Botany) and Melbourne, over the ten-year period 2012-2021 FY, inclusively. The analysis detailed in this Chapter extends to the trends in each component of supply chain cost as well as the relative size of components relative to the commodity values of representative imports.

04 **Export supply chain analysis**
This Chapter outlines an analysis of total supply chain cost (nominal and real) for several representative export container journey's at the East Coast ports of Brisbane, Sydney (Botany) and Melbourne, over the ten-year period 2012-2021 FY, inclusively. The analysis detailed in this Chapter builds on that detailed in Chapter 3, with an analysis of component trends and relative size comparisons for components with respect to commodity values of representative exports.

The appendices attached to this Report provide further details relevant to some sections and are referenced throughout the body of this Report as is relevant.

2. Trends in the import / export freight supply chain

It is important to consider movements in the components of supply chain cost in the context of broader trends in the import / export freight supply chain

There are several important trends occurring along the import / export freight supply chain that are affecting participants and are important in providing context to the movements observed in the components of total supply chain cost over time. This Chapter provides a brief overview of several key trends including, increasing conglomeration of shipping lines, historically low profitability of stevedores, trends in increasing road transport costs, port privatisation, vessel sizes and empty container park fees.

Increasing conglomeration of shipping lines

As an indicator of the market dynamics, the average freight rate for the 'benchmark' Shanghai-Melbourne trade halved over the last decade (pre-COVID).[1] This historically low freight rate was driven by overcapacity on the supply side and sluggish demand off the back of the Global Financial Crisis (GFC). Reportedly, 2012-2014 saw a noticeable uplift in the number of vessels as ships ordered prior to the GFC were completed and ready to enter service. These ships had been ordered when global demand for commodities was high but as demand slowed shipping lines were faced with excess capacity.[2] COVID-19 has seen disruptions across global supply chains that has ultimately led to the average freight rate approximately doubling in the last two years – a cost born by cargo owners.

Freight rates are not the only source of income for a shipping line. In addition to the physical transportation cost, often referred to as the 'blue water' cost, the shipping line passes on a number of additional fees and charges in the form of: lift on lift off (LOLO) fees, port service providers' charges, terminal handling charges, fees for administration and terminal security fees incurred by the shipping line when engaging with the port and terminal facilities.

A comparison of 'blue water' freight rates and additional port charges over the past ten years shows a rapid increase (during COVID) as well as rapid growth in additional port charges [redacted]

In part, this reflects the ability of shipping lines to enter into agreements among themselves (enabled by Part X of the Competition and Consumer Act) in relation to freight rates to be charged and the quantity and kinds of cargo to be carried on particular trade routes influences prices.[3]

Further, there has been an increasing trend of acquisition and conglomeration that is reflected in an accelerating and upwards trend in the Herfindahl-Hirschman Index (an index that indicates a more concentrated market with high values).[4] Increasing concentration of shipping lines improves the bargaining position of shipping lines with respect to other supply chain participants such as cargo owners, empty container park operators and stevedores.

[redacted]

[1] UNCTAD (2019), 'Review of maritime transport 2019' - https://unctad.org/en/Publicat onsLibrary/rmt2019_en.pdf
[2] ABC (2015), 'Australian exporters watch competitive advantage erode as shipping rates plunge' - https://www.abc.net.au/news/rural/rural-news/2015-06-02/shipping-rate-plunge-australia-exporters/6513624
[3] DITRDC (2018), 'Registration Process for Conference Agreements' - https://www.infrastructure.gov.au/maritime/business/liner_shipping/str-conference-agreements/index aspx
[4] Internat onal Transport Forum (2018), 'The impact of alliances in container shipping' - https://www. tf-oecd.org/s tes/default/files/docs/impact-alliances-container-shipping.pdf

Further, a decline in quayside revenues and a low profitability environment for stevedores are important trends in recent years for contextualising movements in supply chain cost

Stevedore revenue composition and historically low profitability[5]

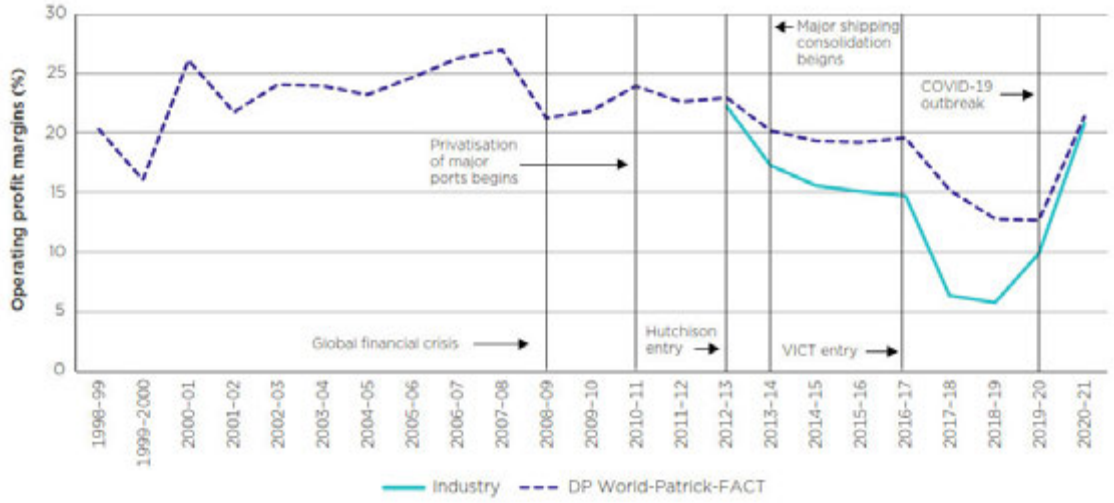
Changes in components of IMEX supply chain costs have and continue to be, a point of contention between supply chain operators, cargo owners and governments. Recent increases in stevedore landside charges have received attention from land-based transport operators and various state governments.

This issue is especially relevant for stevedores operating at Australia's major East Coast container port's at Port Brisbane, Port Botany and Port Melbourne, whereby stevedores have received pressure from government's over increases to landside access prices. Criticism of these price increases are often levelled without consideration of the broader context of declining quayside charges in an environment characterised by low-profitability for stevedores in recent years (refer Charts B and C).

There have been several trends that have impacted the profitability of stevedores in recent years. Reported over-investment and capacity in the stevedore market in recent years with the addition of a third stevedore at East Coast ports. A decline in average quayside charges in general at East Coast stevedores (in part, likely a result of increasing consolidation of shipping lines and a concentration of bargaining power) have contributed to low profitability in the industry. Additionally, increasing unit costs, rental and electricity increases as well as labour costs, industrial relations disruptions and necessary capital expenditure have all added downwards pressure on stevedore operating margins. Crucially, the recent ACCC report found that the improvement in recent years to operating profitability has been the result of increases in throughput associated with COVID-19 and is not indicative of excessive returns.

[redacted]

Chart C: Estimated industry operating margins



Source: ACCC, 2021[5]

[5] ACCC (2021), 'Container stevedoring mon toring report 2020-21' - https://www.accc.gov.au/publicat ons/container-stevedoring-mon toring-report/container-stevedoring-mon toring-report-2020-21

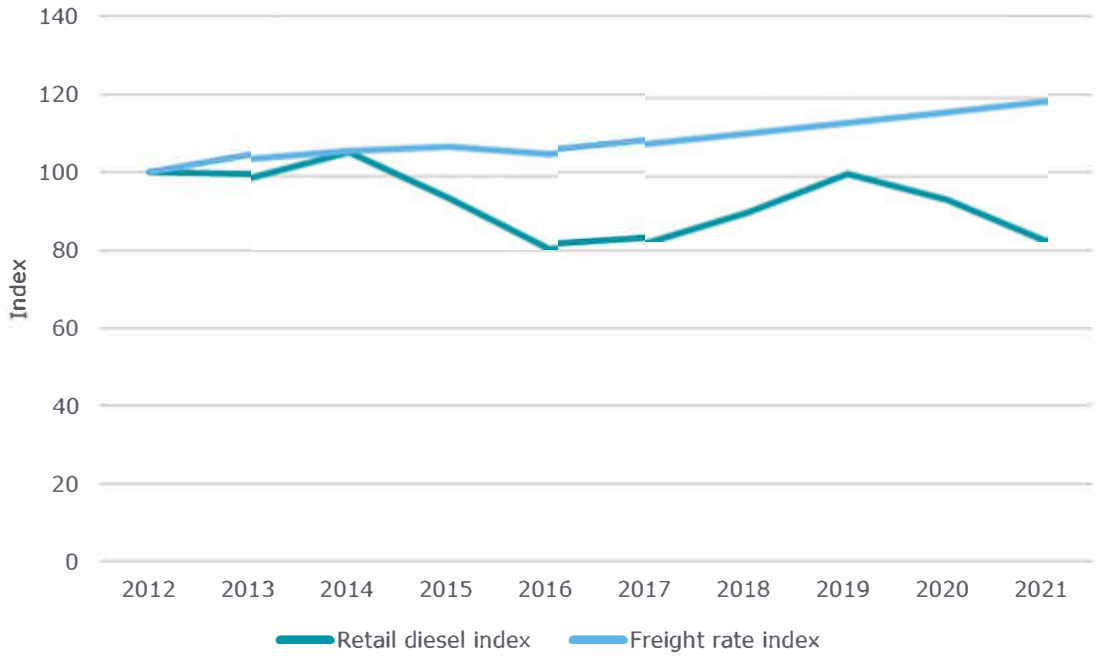
Analysis of trends in road transport costs highlight rising retail diesel fuel prices and a declining real diesel fuel rebate as two key 'drivers' of rising road transport freight rates

Trends in increasing road transport costs[6]

Approximately half of the upwards trend in land transport freight costs could be explained through retail diesel prices over the period between 2010 to 2019; however, the COVID-19 period beyond 2019 has seen declining retail diesel prices that have not been reflected in freight rates offered to cargo owners (refer Chart D). As a key variable input, road freight rates should, in general, be influenced by retail diesel prices as fuel is a significant input to road freight transport. A separate consideration are the 'temporary' COVID-19 levies that have been announced recently by various transport operators (Qube, Silk and others) in the range of $20-$25 per box.

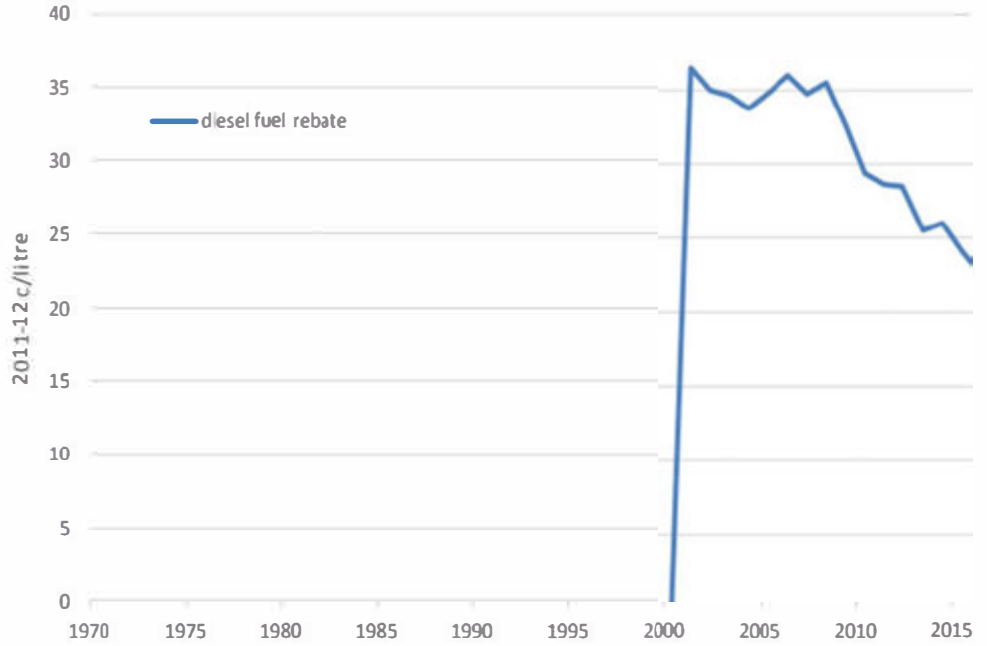
Another explanator, is the Diesel Fuel Rebate Scheme introduced in 2000 which offers a fuel rebate for road transport operators and has declined in real terms since introduction in 2000 (refer Chart E). As a consequence, road transport operators are exposed to increased variable costs.

Chart D: Trend comparison between retail diesel prices and freight rates[6,7]



Source: Deloitte Analysis using data from Australian Institute of Petroleum and BITRE

Chart E: Real diesel fuel rebate[6]



Source: BITRE, 2017

[6]BITRE (2017), 'Freight Rates in Australia' - https://www.bitre.gov.au/publications/2017/is_090
[7]AIP (2021), 'AIP Annual Retail Price Data' - https://www.aip.com.au/aip-annual-retail-price-data

Port privatisation, increasing vessel sizes and pressures for empty container parks are also key trends 'driving' changes in supply chain cost

Port privatisation and increasing rents[8]

Historically, the majority of Australian ports were publicly owned. Since institutional reforms in the 1980s there has been a gradual transformation of these public port authorities into independent government owned entities under the Corporations Act 2001 and other relevant legislature. Under these frameworks, state government's generally lease out land via long-term lease arrangements (up to 100 years) to private landlords who in turn, charge rent to private port operators. This situation has led to increases in rents at several major Australian container ports and criticism from several participants in the IMEX supply chain.

[redacted]

As a core fixed cost for stevedores, rental increases are putting increasing pressure on the profitability of stevedore operators and a key 'driver' indicated by stevedores for increases in prices.

Increases in vessel sizes

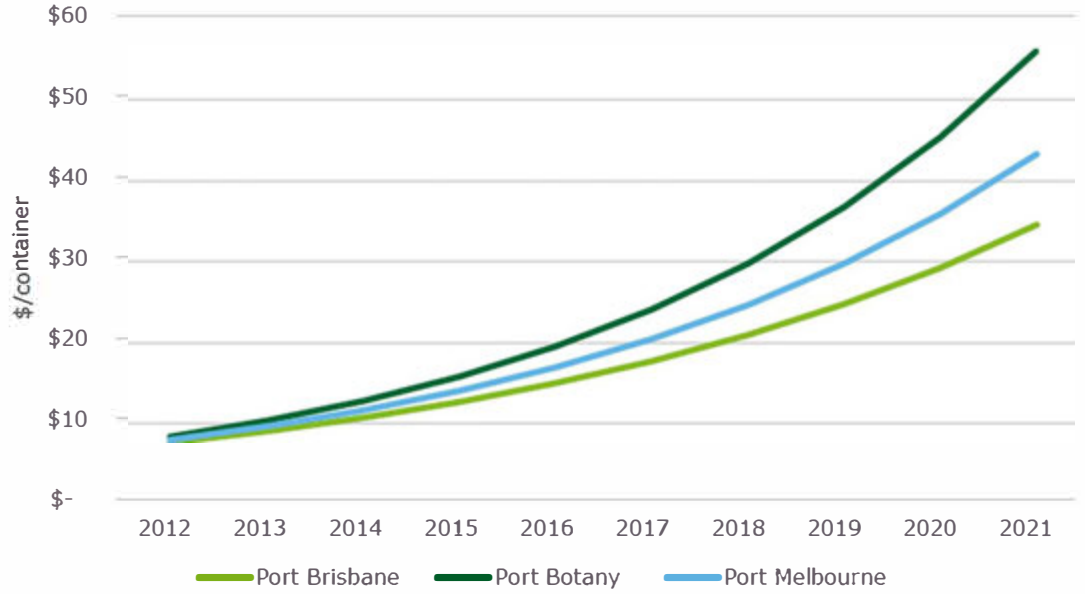
The size of vessels has historically increased and has been one of several key drivers of investment from stevedores. The productivity gains offered by larger vessels improves the profitability of operations for shipping lines. The practical operation of these larger vessels is to an extent, aided by the ability of shipping line alliances to capacity share.

Large vessel sizes have implications for stevedore operators including for bargaining power and for infrastructure requirements. Fewer vessels calling at ports improves the bargaining position of shipping lines as contract value per vessel increases. Further, in order to service larger vessels stevedores may require significant capital expenditure to upgrade and expand facilities.

Empty container parks (ECPs) and shipping line pressures

ECPs earn revenues through de-hire and storage charges that are levied to road transport operators and shipping lines. Traditionally a large proportion of revenues for ECPs are accumulated from shipping lines. Anecdotal evidence provided in consultation with Deloitte suggests that pressure from shipping lines has resulted in a decline in overall revenue per empty container for an ECP (c. $80/container in 2020, down from c. $120/container). In recent years, shipping lines have also become increasingly integrated, acquiring ECPs. Simultaneously, prices levied by ECPs to road transport operators for de-hire of empty containers have increased (refer Chart F) significantly (this is explored in greater detail in Chapter's 3 and 4).

Chart F: Nominal ECP de-hire charges at East Coast ports, 2012-2021



Source: Deloitte analysis using Freight Trade Alliance database

[8]AFR (2015), 'DP World wins rent battle with Port of Melbourne' - https://www.afr.com/companies/transport/dp-world-wins-rent-battle-with-port-of-melbourne-20150803-gigddz#:~:text=The%20new%20lease%20gives%20DP,and%20agreed%20escalations%20to%202028.

3. Import supply chain analysis

This Chapter outlines the analysis of import supply chain costs for representative container journeys from Shanghai, China to each of the East Coast capital city ports

Overview

Outlined in this Chapter is the analysis of total containerised import supply chain costs for a cargo owner at Australia's major East Coast ports: Brisbane, Sydney (Port Botany) and Melbourne. Combined, these three ports handle c. 3.5 million import TEUs; upwards of 75% of Australia's containerised import trade.[8]

The analysis focuses on several representative import container journeys. Specifically, the analysis highlights the real and nominal total supply chain cost at each port over the period: 2011/12 financial year – 2020/21 financial year. This includes analysis of the real and nominal change in components of total supply chain cost as well as the percentage contribution of supply chain participants to overall cost.

The analysis focuses on several 'representative' container journeys, these include:

- 20ft GP container of high-value electronics:
    - Shanghai, China -> Port of Brisbane
    - Shanghai, China -> Port Botany
    - Shanghai, China -> Port of Melbourne

Whilst focusing on these 'representative' container journeys and commodity types, the analysis is extended to consider the implications of other common containerised imports such as white goods and apparel.

[8]ACCC (2021), 'Container stevedoring monitoring report 2021' - https://www.accc.gov.au/publications/container-stevedoring-monitoring-report/container-stevedoring-monitoring-report-2020-21

Analysis of total supply chain cost over the ten years to 2021 highlight a notable increase in total supply chain cost with shipping line and road transport costs contributing upwards of 80%

Supply chain analysis

The nominal total cost of importing a full 20ft GP container of high value electronics from Shanghai, China in 2021 is estimated at between [redacted] per container for containers destined for Greater Brisbane, Sydney and Melbourne (refer Charts G,H and I). These estimates represent a significant increase in real terms of [redacted] with an acceleration in recent years largely driven by COVID-19 implications on the supply chain and increases in 'blue water' shipping rates. [redacted]

The largest component of nominal total supply chain costs in 2021 are those of shipping lines – 'blue water' freight and additional port charges' – [redacted]. This largely reflects increases observed during the COVID-19 years [redacted]. The second largest component of nominal total supply chain costs in 2021 are those of road transport operators – physical haulage and 'mark-ups' on incidental costs – [redacted] Combined, shipping line and road transport costs represent [redacted] of nominal total supply chain cost in 2021.

The remaining [redacted] is comprised of stevedore charges, empty container park charges, port service charges and customs fees [redacted].

A further breakdown of component costs is provided overleaf.

[redacted]

A breakdown of representative import supply chain costs highlights stevedores as a small proportion of total cost [redacted] with shipping lines comprising the 'lions share'

A breakdown of nominal total supply chain cost components highlights shipping line charges as the largest cost component at [redacted] (refer Chart J). Notably, the contribution of stevedores to overall total supply chain cost is low [redacted] Further analysis of the changes in nominal supply chain cost components is provided overleaf, including consideration of the scale of changes.

[redacted]

Analysis of absolute changes in component costs over time highlights high absolute growth in shipping line with moderate growth elsewhere in the supply chain (including stevedores)

Due to rapid increases in the cost of 'blue water' freight in recent years, shipping line charges have increased by the largest absolute change [redacted] over the period 2012-2021 (refer Table 1). Shipping line charges are the largest component of cost [redacted].

Despite being the second fastest growing component in absolute terms, stevedores remain a small proportion [redacted] of total supply chain cost, [redacted] Empty container parks have experienced significant growth over the period [redacted] but remain the smallest component of supply chain cost so have not increased by a large amount in absolute terms. Customs fees have in recent years through COVID concessions etc. have reduced in absolute terms [redacted]. Road transport costs as the second largest component of cost in the supply chain have increased [redacted]. Port service charges have been some of the fastest growing components for some ports [redacted] but is also a small component of total supply chain cost so has not increased by a large amount in absolute terms relative to other components.

In summary, the largest 'drivers' of supply chain cost have been shipping lines. Of the total increase in supply chain cost for cargo owners in the last ten-years, stevedores are responsible for less [redacted]

[redacted]

A comparison of supply chain costs and specifically, those costs attributable to stevedoring services for representative import commodities highlights the relative size and significance of these with respect to the value of containers

Total supply chain costs and further, those costs attributable to stevedoring services represent an insignificant proportion of the total value of a representative import box (refer Figure 1). For a 20ft container of high value electronics total supply chain cost amounts to [redacted] of the total value of goods per container. Further, the proportion of total supply chain cost attributable to stevedores amounts to [redacted] of container value for this representative good.

For other common import goods such as white goods (household appliances), a conventional 20ft container may represent a total value of $150,000. Average total supply chain costs at East Coast ports amount to [redacted] of total container value for this representative good with those costs attributable to stevedores estimated to be only [redacted]

A final representative import example for a lower value commodity includes worn clothing and textiles is provided in this analysis. A conventional 20ft container may represent a total value of $12,500. Average total supply chain costs at East Coast ports amounts to [redacted] of total container value with stevedore costs [redacted]. This highlights that stevedore costs are a small proportion of the total value – even for lower value commodity imports.

[redacted]

Notes: Values per container derived from international values provided by the Queensland Treasury Department. An East Coast port average is used for total supply chain cost and is applicable for a 20ft GP container. Analysis assumes a net tonne mass of 20 tonnes for high value electronics and household appliances and 22.5 tonnes for worn clothing, textiles and rags.

A 'deeper dive' into the landside component of stevedore pricing highlights that these costs have in the past, and continue to remain a small proportion of total supply chain costs and especially in light of the value of common import commodities

It is well understood by industry and detailed by the ACCC in the annual container stevedore monitoring reports that landside charges by stevedores have increased in recent years. The trend in these charges reflects several operational factors, such as:

- Increasing operational costs such as rents and labour
- Expansive investment programs to improve landside operations an access
- Commercial arrangements with customers both landside and quayside
- Adequate returns on investment.

Despite rationale put forward by stevedores and the findings of the ACCC that there are no supernormal profits or abuse of market power this topic remains a point of contention for stakeholders across the supply chain.

This analysis highlights that while the share of landside charges in terms of total supply chain costs have increased in the last ten-years, they remain a small proportion of total cost for a cargo owner (refer Chart K). Further, when considered in the context of the value of common import commodities such as high value electronics, white goods or textiles stevedore landside charges represent [redacted] on a per container basis.

4. Export supply chain analysis

This Chapter outlines the analysis of export supply chain costs for representative container journeys to Shanghai, China from each of the East Coast capital city ports

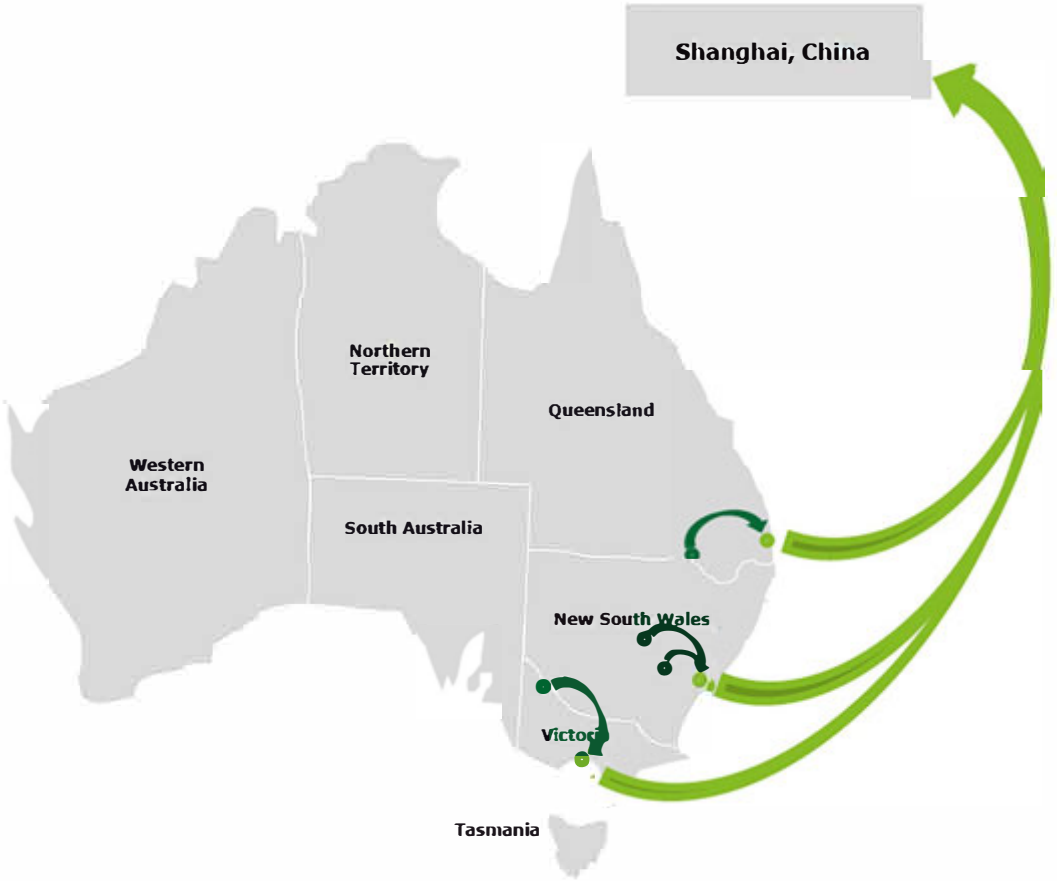
Overview

Outlined in this Chapter is the analysis of total containerised export supply chain costs for a cargo owner at Australia's major East Coast ports: Brisbane, Sydney (Port Botany) and Melbourne. Combined, these three ports handle c. 3.5 million export TEUs; upwards of 75% of Australia's containerised export trade.

The analysis focuses on several representative export container journeys. Specifically, the analysis highlights the real and nominal total supply chain cost at each port over the period: 2011/12 financial year – 2021/22 financial year. This includes analysis of the real and nominal change in components of total supply chain cost as well as the percentage contribution of supply chain participants to overall cost.

The analysis focuses on several 'representative' container journeys, these include:

- 20ft GP container of grain:
    - Port Brisbane -> Shanghai, China
    - Port Botany -> Shanghai, China
    - Port Melbourne -> Shanghai, China
- 20ft refrigerated container (reefer) of meat:
    - Port Botany -> Shanghai, China
- 40ft GP container of cotton:
    - Port Botany -> Shanghai, China.



Analysis of total supply chain cost over the ten-years to 2021 highlight a marginal increase in total supply chain cost with road transport costs comprising a larger component for exports relative to imports

Supply chain analysis

A full 20ft GP container of grain bound for Shanghai, China in 2021 is estimated at between [redacted] for routes originating in Goondiwindi (QLD), Dubbo (NSW) and Mildura (VIC) (refer Charts L, M and N). These estimates represent a notable increase in real terms [redacted] with an acceleration in recent years with COVID-19 driven supply chain impacts and particularly the observed increases in 'blue water' shipping rates. [redacted]

The largest component of nominal total supply chain costs in 2021 are those of shipping lines – both through 'blue water' freight and additional port charges' [redacted] This largely reflects increases observed during COVID-19 years [redacted] The second largest component of nominal total supply chain costs in 2021 are those of road transport operators – physical haulage and 'mark-ups' on incidental costs [redacted] For exports, these two components combined can represent almost [redacted] of the nominal total supply chain cost for a cargo owner (depending on the distance of the road-based leg).

Stevedore charges at East Coast ports range from [redacted] per container with the residual comprising of [redacted] per container for empty container parks, [redacted] per container for port service charges and [redacted] per container for customs fees.

[redacted]

[10]ABS (2020), '6401.0 Consumer Pr ce Index, Australia; All groups - https://www.abs.gov.au/statistics/economy/pr ce-indexes-and-inflat on/consumer-pr ce-index-australia/latest-release#data-download

Real total supply chain costs for reefer and 40ft GP containers have experienced marginally higher growth, reflective of notably higher shipping line and road transport components relative to a 20ft GP container

Supply chain analysis

A full 20ft reefer of meat bound for Shanghai, China in 2021 is estimated at approximately [redacted] per container for cargoes originating from near Orange (NSW) (refer Chart O). This estimate represents a [redacted] increase in total real supply chain cost over the ten years to 2021 [redacted]

The largest component of nominal total supply chain cost for a 20ft reefer of meat in 2021 are those of shipping lines [redacted] per reefer container. These costs have increased at a rapid rate in the COVID-19 period from 2019 onwards. Road transport costs are the second largest [redacted]. The residual cost represents [redacted] per container of stevedore charges, [redacted] per container for empty container park fees, [redacted] per container for port service charges and [redacted] per container for customs fees.

A full 40ft GP container of cotton lint (bales) bound for Shanghai, China in 2021 is estimated at approximately [redacted] per container for routes originating in Dubbo (NSW) (refer Chart P). This estimate represents a [redacted] increase in total real supply chain cost over the ten years to 2021 [redacted]

As with the 20ft reefer container of meat, the largest components are shipping line and road transport charges at [redacted] per container, respectively. The residual components include [redacted] per container for stevedore charges, [redacted] per container for empty container charges, [redacted] per container for port service charges and [redacted] per container for customs fees.

[redacted]

A breakdown of representative export supply chain costs highlights stevedores account for a smaller proportion of total cost [redacted] relative to imports with road transport and shipping line costs representing the largest components

A breakdown of nominal total supply chain cost components highlights shipping line charges as the largest cost component [redacted]. Notably, the contribution of stevedores to overall total supply chain cost in all of the representative container journey's is low [redacted] Further analysis of the changes in nominal supply chain cost components are provided overleaf, including consideration of the scale of changes.

Analysis of absolute changes in component costs over time highlights a similar story for exports as for imports with high growth in shipping lines with moderate growth elsewhere in the supply chain (including stevedores)

The largest component of total supply chain cost, shipping line charges, have grown rapidly particularly in recent years due to increases in the cost of 'blue water' freight. Consequently, shipping line charges have increased by the largest absolute change [redacted] over the period 2012 – 2021 (refer Table 2). Road transport charges, being the second largest component of cost for a representative exporter, have increased year-on-year [redacted] increasing in absolute terms [redacted]. Stevedore charges were the third fastest growing component of supply chain cost in absolute terms over the period, [redacted] Crucially, stevedore charges remain a relatively small proportion of total cost.

Empty container park charges have grown significantly over the period [redacted] Nevertheless, these charges have grown off a small base and remain the smallest component of supply chain cost. However, there are concerns from industry over the ownership and control of empty container parks by shipping lines and the associated rate of increase. Port service charges and customs fees experienced moderate growth over the period [redacted]

In summary, the two largest 'drivers' of supply chain cost have been road transport and shipping lines [redacted]

[redacted]

As for imports, supply chain costs and those costs attributable to stevedoring services represent a small proportion of the value of export commodities. Nevertheless, these costs are more significant for exporters than for importers due to the generally lower value of export commodities

In general, containerised Australian export commodities (which is dominated by agricultural products) tend to be lower in value per container than imports and consequently, supply chain costs amount to a larger percentage of total product value per container. Nevertheless, those costs attributable to stevedoring services remain a small proportion of the total value of a representative export box (refer Figure 2). For a 20ft reefer container of fresh, chilled or frozen meat (valued at approximately $150,000 per container - at the low end of a range that could be as high as $500,000 for top quality chilled beef cuts), total supply chain costs amount to [redacted] of the total value of the comprising goods. Further, the proportion of total supply chain costs attributable to stevedoring services amounts to a much smaller estimate of [redacted] of total container value.

For other common export goods such as cotton, a conventional 40ft container may represent a total value of $64,200. Total supply chain costs for this container are estimated to amount to [redacted] of the total value of the container with stevedoring costs amounting to a smaller [redacted].

[redacted]

For an average 20ft container of grains, total supply chain costs are estimated to amount to [redacted] of the total value of the container with stevedoring services amounting to [redacted] of total containerised product value.

[redacted]

A ‘deeper dive’ into the landside component of stevedore pricing highlights that these costs have in the past, and continue to remain a small proportion of total supply chain costs including for low value export commodities such as grains

As for imports, it is well understood by industry and detailed by the ACCC in the annual container stevedore monitoring reports that landside charges by stevedores have increased in recent years. The trend in these charges reflects several operational factors, such as:

- Increasing operational costs such as rents and labour
- Expansive investment programs to improve landside operations and access
- Commercial arrangements with customers both landside and quayside
- Adequate returns on investment.

Despite rationale put forward by stevedores and the findings of the ACCC that there are no supernormal profits or abuse of market power, this topic remains a point of contention for stakeholders across the supply chain.

This analysis highlights that while the share of landside charges in terms of total supply chain costs have increased in the last ten-years, they remain a small proportion of total cost for a cargo owner (refer Chart R). In reference to imports, this proportion is also smaller for the total cost of exportsFurther, when considered in the context of the value of common export commodities such as grains, meats or cotton stevedore landside charges represent [redacted] on a per container basis.

Appendix A – Import / export supply chain model

IMEX Supply Chain Model

This appendix sets out the methodology employed to estimate the various cost components of the IMEX supply chain over the ten years to 2021 (2012-2021 financial year's, inclusive).

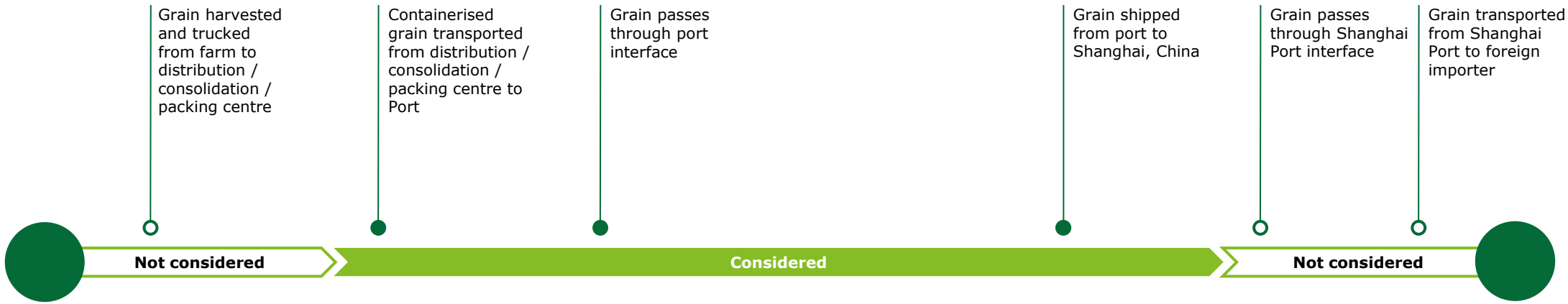
It is important to note that total freight cost and components are subject to change based on several factors including seasonality in freight rates, land and 'blue water' travel distances, types of container ("dry" versus "reefer", 20ft versus 40ft), assumptions around charging and historical cost trends in addition to other factors. As such, the model estimates indicative cost and caution must be exercised when interpreting and extrapolating to examples other than those analysed.

Overview

The model estimates total supply chain costs of representative import and export containers through Port Brisbane, Port Botany and Port Melbourne *for the cargo owner*. It estimates these costs over the ten-year period 2012-2021, inclusively. The model focuses on domestic costs only with the extension to shipping line charges. It does not include costs incurred in other sovereign nations (refer Figure A.1).

A detailed model schematic is provided overleaf with the following pages (including Figure A.2 and Figure A.3) outlining the methodology for calculating each component of supply chain cost.

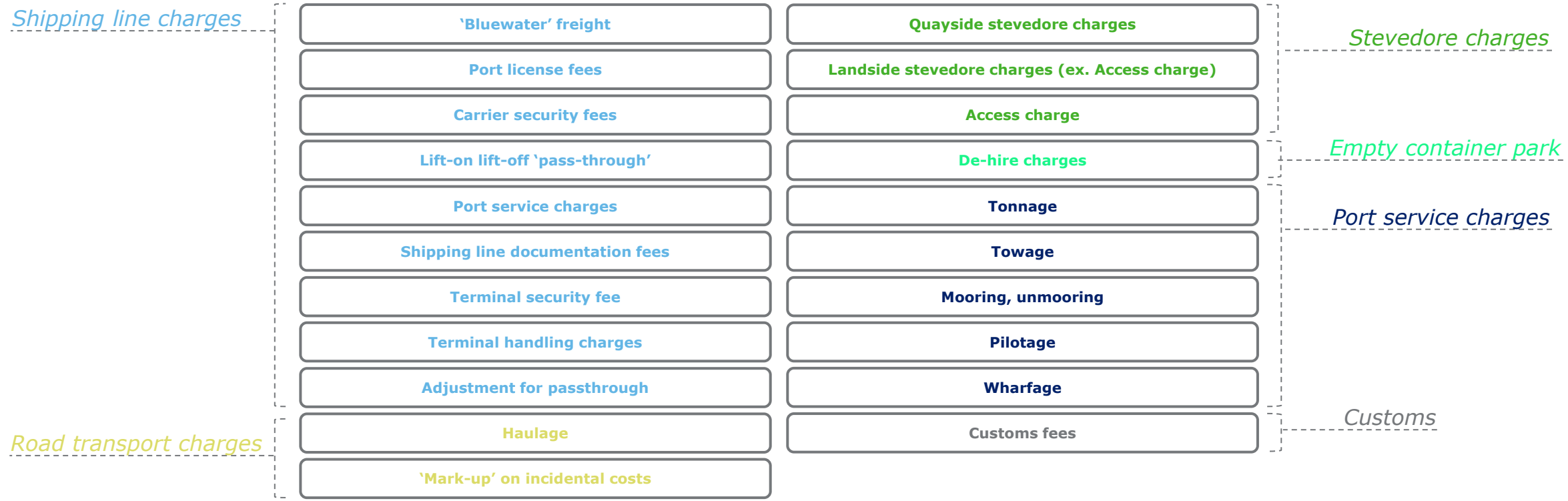
Figure A.1: Containerised grain export example for scope of IMEX supply chain model



Source: Deloitte Access Economics

IMEX Supply Chain Model

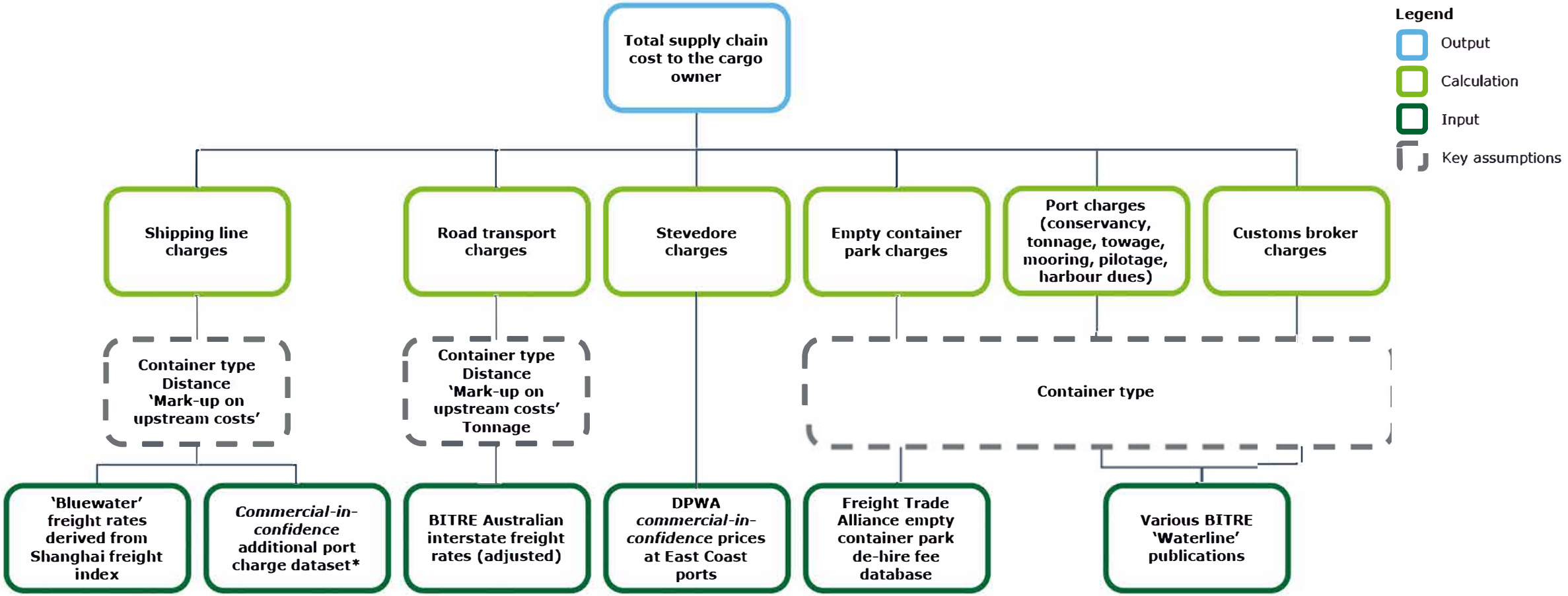
Figure A.2: Component charges captured by the IMEX supply chain model



Source: Deloitte Access Economics

IMEX Supply Chain Model

Figure A.3: Representative 'IMEX supply chain cost model' schematic



Source: Deloitte Access Economics

IMEX Supply Chain Model

Shipping line charges[13]

There are broadly two components to shipping line costs that a cargo owner incurs: 'blue water' freight costs and additional port charges. 'Blue water' freight costs relate to the physical transportation of a container from port-to-port. On the other hand, additional port charges are surcharges used by shipping lines to pass on costs incurred whilst interacting with the port interface. These additional charges include port license fees, carrier security fees, lift-on-lift-off charges, channel deepening fees, port congestion surcharges, port service charges, documentation fees, terminal security fees and terminal handling charges. Largely, these additional port charges are used to pass on port service charges such as tonnage, mooring, pilotage and wharfage as well as stevedore quayside charges.

To estimate the 'blue water' freight element of shipping costs, yearly average freight rates were sourced from the UNCTAD Review of Maritime Transport reports. These rates are specific to the Shanghai-Melbourne freight route and are derived from the Shanghai Containerized Freight Index (SCFI). Rates are quoted in USD. As such, the rates were subsequently converted to AUD using yearly average exchange rates calculated by Deloitte Access Economics.

The SCFI includes seaborne surcharges including the bunker adjustment factor, emergency bunker surcharge, currency adjustment factor, peak season surcharge, port congestion surcharge and other transit fees. These surcharges are separate from additional port charges also captured by the model.

Additional port charges were estimated using yearly averages of *commercial-in-confidence* data obtained through consultation. This data has been forecast forward to 2021 using historical average growth rates using a ten-year moving average.

Deloitte understands that there may exist a discount for export containers heading north to China; however, has not been able to confirm this phenomenon and as such, 'blue water' freight and additional port charges were assumed to be the same for both an import and export TEU.

An adjustment is made to account for port interface costs that the shipping line passes on to cargo owners.

Customs charges[14]

Customs charges were obtained from several BITRE 'Waterline' reports and differentiated by import and export containers.

[11] UNCTAD (2021), 'Review of Mar time Transport' - https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf
[12] BITRE (2021), 'Waterline' - https://www.bitre.gov.au/taxonomy/term/82

IMEX Supply Chain Model

Road transport charges[15]

To estimate the road transport cost, the model accounts for freight costs and reported 'mark-ups' on incidental costs such as stevedore landside charges.
For the haulage component, BITRE yearly average freight rates - quoted in cents per net tonne kilometre - are multiplied against an assumed tonnage per container and again against the relevant distance (obtained via the National Heavy Vehicle Regulator website) travelled for the respective export and import container. Assumed transport distances and net tonne loads for container types are provided in Table A.1. For import containers whereby journey distances are relatively small, an adjustment factor is used to inflate road transport costs to align with *commercial-in-confidence* invoices Deloitte has obtained through previous engagements.

[redacted]

Stevedore charges[16]

The model includes three separate components of stevedore charges: "quayside charges," "landside charges" and the landside access charges ('access charge'). Average charges for each component were provided by DPWA. Where applicable an average TEU-container conversion factor of 1.5 TEU per container was applied (as indicated in the data provided to Deloitte by DPWA).

Empty container charges[17]

De-hire charges for the past ten-years were obtained from a database provided to Deloitte by the Freight Trade Alliance (FTA).

Port service charges[18]

Port service charges include tonnage, towage, mooring, pilotage, wharfage and harbour dues. These charges were acquired from various BITRE 'Waterline' publications for each of the ports.

Table A.1: Road transport charge assumptions

Port	'Representative' container journey	Commodity	Net tonnes per container	Land-based transport distance (km)
Port Botany	20ft GP container – Shanghai, China -> Greater Sydney, NSW	High value electronics	20	35
Port Botany	20ft GP container – Dubbo, NSW -> Shanghai, China	Grains	22.5	405
Port Botany	20ft reefer container – Orange, NSW -> Shanghai, China	Meat	18.5	275
Port Botany	40ft GP container – Dubbo, NSW -> Shanghai, China	Cotton	22.5	405
Port Brisbane	20ft GP container – Shanghai, China -> Greater Brisbane, QLD	High value electronics	20	30
Port Brisbane	20ft GP container – Goondiwindi, QLD -> Shanghai, China	Grains	22.5	380
Port Melbourne	20ft GP container – Shanghai, China -> Greater Melbourne, VIC	High value electronics	20	37
Port Melbourne	20ft GP container – Mildura, VIC -> Shanghai, China	Grains	22.5	550

Source: Deloitte Access Economics

[13] BITRE (2017), 'Freight rates in Australia' - https://www.bitre.gov.au/sites/default/files/is_090.pdf
[14] DPWA provided data
[15] FTA provided database
[16] BITRE (2021), 'Waterline' - https://www.bitre.gov.au/taxonomy/term/82

Limitation of our work

General use restriction

General use restriction

This report is prepared solely for the internal use of the DP World Australia. This report is not intended to and should not be used or relied upon by anyone else and we accept no duty of care to any other person or entity. The report has been prepared for the purpose set out in our engagement letter. You should not refer to or use our name or the advice for any other purpose.

Deloitte.

Deloitte Access Economics is Australia's pre-eminent economics advisory practice and a member of Deloitte's global economics group. For more information, please visit our website: www.deloitte.com/au/deloitte-access-economics

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited ("DTTL"), its global network of member firms, and their related entities. DTTL (also referred to as "Deloitte Global") and each of its member firms and their affiliated entities are legally separate and independent entities. DTTL does not provide services to clients. Please see www.deloitte.com/about to learn more.

Deloitte is a leading global provider of audit and assurance, consulting, financial advisory, risk advisory, tax and related services. Our network of member firms in more than 150 countries and territories serves four out of five Fortune Global 500®companies. Learn how Deloitte's approximately 286,000 people make an impact that matters at www.deloitte.com.

Deloitte Asia Pacific
Deloitte Asia Pacific Limited is a company limited by guarantee and a member firm of DTTL. Members of Deloitte Asia Pacific Limited and their related entities provide services in Australia, Brunei Darussalam, Cambodia, East Timor, Federated States of Micronesia, Guam, Indonesia, Japan, Laos, Malaysia, Mongolia, Myanmar, New Zealand, Palau, Papua New Guinea, Singapore, Thailand, The Marshall Islands, The Northern Mariana Islands, The People's Republic of China (incl. Hong Kong SAR and Macau SAR), The Philippines and Vietnam, in each of which operations are conducted by separate and independent legal entities.

Deloitte Australia
In Australia, the Deloitte Network member is the Australian partnership of Deloitte Touche Tohmatsu. As one of Australia's leading professional services firms. Deloitte Touche Tohmatsu and its affiliates provide audit, tax, consulting, and financial advisory services through approximately 8000 people across the country. Focused on the creation of value and growth, and known as an employer of choice for innovative human resources programs, we are dedicated to helping our clients and our people excel. For more information, please visit our web site at https://www2.deloitte.com/au/en.html.

Liability limited by a scheme approved under Professional Standards Legislation.
Member of Deloitte Asia Pacific Limited and the Deloitte Network.