ACIL ALLEN

23 February 2023

Report to Port of Melbourne Operations Pty Ltd

2021-22 Economic contribution of the Port of Melbourne

FINAL REPORT

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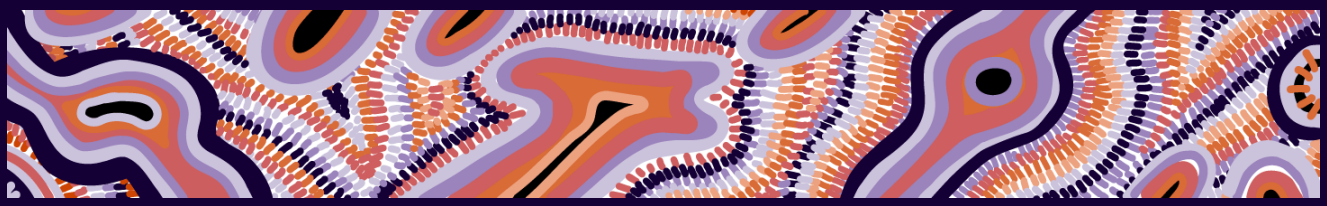

Goomup, by Jarni McGuire

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Glossary

ABS	Australian Bureau of Statistics
Break bulk	A cargo that is not transported in a unitised form is individually placed within vessel holds. Break bulk cargo can typically, but not only, include project cargoes (structural steel, equipment, etc), timber, paper, and metal ingots.
Consumption-induced effects	Additional output, value added, employment and household income resulting from re-spending by households that receive payment from jobs in direct and indirect activities. Consumption-induced effects are sometimes referred to as “induced effects”.
CIF	CIF is the price of a good delivered at the port, including insurance and freight charges.
Container	An international standardised form of unitised cargo used for storage, handling and transport. Container units come in standard sizes (TEU) and can be easily moved by and transferred between road, rail and sea freight transport modes.
Direct effects	The economic activity directly generated by the Port of Melbourne.
Dry bulk	Dry cargo is transported direct from one port to another in bulk within the hold of specially designed vessels. The shipment is mechanically loaded (typically using conveyors, grab buckets or pneumatic systems) and is similarly unloaded.
Employment	The economic contribution is calculated as the total number of Full Time Equivalent (FTE) jobs and covers all staff (including working proprietors, managers, directors and all other employees).
Flow-on effects	The sum of the production-induced effects and the consumption-induced effects.
FOB	Free on Board (FOB) is used to indicate when the ownership of goods transfers from buyer to seller and who is liable for damaged or destroyed goods.
FTE	Full Time Equivalent (FTE) job is a job which is undertaken on a full-time basis. For part-time work, a pro-rated FTE is used. For instance, a position

	which involves two days a week of work would be 0.4 FTE, and 2.5 such appointments would be required to achieve an FTE of 1.0.
Gross Regional Product	GRP is a measure of value-added on a regional basis. It is calculated using two methods. The income method calculates GRP as household income plus other value-added. The expenditure method calculates GRP as household expenditure plus other final demand, that is, gross regional expenditure plus exports less imports.
Household income	A measure of economic contribution is calculated as the sum of the wages and salaries and other payments to labour, including any overtime payments and income tax, excluding payroll tax.
Indirect effects	The combination of secondary economic effects generated by the direct expenditure of business and labour (employees, etc.) involved in an economic activity.
Input-output analysis	An accounting system of inter-industry transactions based on the notion that no industry exists in isolation.
Input-output table	A transactions table that illustrates and quantifies the purchases and sales of goods and services taking place in an economy at a given point in time. It provides a numerical picture of the size and shape of the economy and its essential features. Each item is shown as a purchase by one sector and a sale by another, thus constructing two sides of a double accounting at region, state and the economy.
Liquid bulk	Cargo is also transported in bulk in specially designed vessels directly from one port to another. As the shipment is liquid, the pump takes its loading and unloading at the port.
Mass tonnes	A quantity measure is used to assess the throughput of a port based on the total weight of the cargo handled. Key shipments will likely include containers, motor vehicles, wheeled units, liquid bulk, dry bulk and break bulk.
Motor vehicles	Motor vehicles are transported from one port to another using specially designed vessels which allow the vehicles to be driven onto the vessels at the port of origin and then driven off the ship at the destination port.
Multiplier	An index (ratio) indicates the overall change in the activity level that results from an initial change in economic activity. Multipliers indicate the strength of the linkages between a particular sector and the rest of the regional economy. They estimate the contribution of a change in that specific sector to the rest of the economy.
Output	Output is a measure of economic contribution. It is the gross revenue of goods and services produced by commercial organisations plus gross expenditure by Government agencies. Output, however, has a potential double-counting issue when assessing several businesses with customer/supplier relationships.
PoM	The Port of Melbourne (the Port).

PoMO	The Port of Melbourne Operations Pty Ltd.
Production-induced effects	Additional output, value added, employment and household income resulting from re-spending by firms that receive remuneration from the sale of goods and services to firms undertaking the activity. Production-induced effects are "indirect effects" and represent the total economic activity embodied within the Port of Melbourne's supply chain.
Revenue tonnes	Revenue tonnes is another quantity measure commonly used for port throughput and is the greater of the cargo weight (in mass tonnes) and volume (in cubic metres).
TEU	TEU is a Twenty-foot Equivalent container Unit and is the international standard measure for shipping containers. It is based on a standard international container which has the dimensions of 20 foot (6.1m) long by 8 foot (2.44m) wide and around 8.5 foot (2.6m) high.
Total economic contribution	It is the sum of an economic activity's direct and indirect economic effects.
Value added	The economic contribution is calculated as the value of output less than the cost of goods and services (including imports) used to produce the output. It represents payments to the primary inputs of production (labour, capital and land). Value added is consistent with standard measures of economic activity, such as gross domestic, state or regional product, and it assesses the net contribution to the regional economic growth of a particular enterprise or activity.
Wheeled units	Wheeled units are road vehicles driven onto the vessel (usually a ferry or specially designed roll-on-roll-off vessel) at the port of origin and then driven off at the destination port.

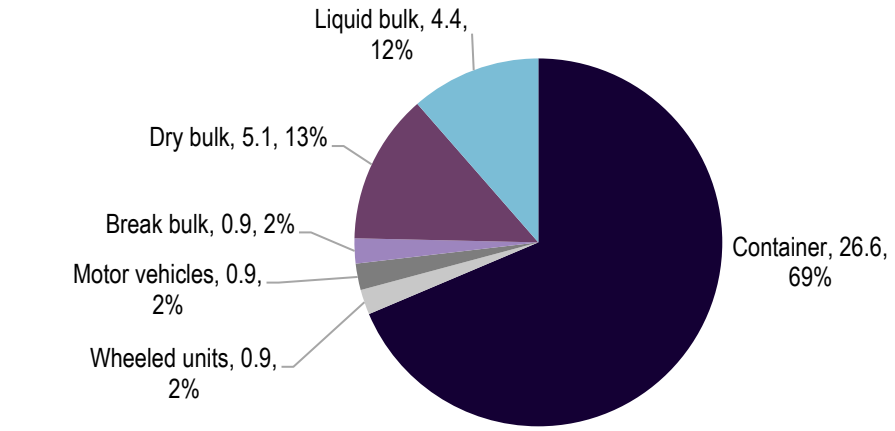
Executive summary

The Port of Melbourne

The Port of Melbourne is a trade catchment that extends far beyond Victorian boundaries. It is Australia's primary container and general cargo port, and is a major strategic economic asset of the Victorian economy.

In 2021-22, the total trade through the Port of Melbourne was 107.6 million revenue tonnes (or 38.8 million mass tonnes). Container trade constituted nearly 70 per cent of trade through the Port measured in mass tonnes.

Figure ES 1 Trade throughput at the Port of Melbourne (mass tonnes), 2021-22



Source: PoMO.

As Australia's major container port, the Port of Melbourne handled more than one-third of Australia's container trade in 2021-22.[1]

The Port is a significant supply chain interface for the Australian eastern states' logistics network.

The Port serves the Tasmanian economy through the Bass Strait domestic and international trades.

It reported 2,858 commercial ship calls in 2021-22 connecting coastal and international trading regions.

[1] https://www.portsaustralia.com.au/resources/trade-statistics

The Port handled 86 per cent ($28 billion FOB basis) value of total Victorian origin exports and 87.6 per cent ($90 billion CIF basis) value of Victorian international imports in 2021-22.

Imports of machinery and vehicles constitute around 36 per cent of imports, followed by chemicals and fertilizers (12 per cent) and clothing and footwear (9 per cent).

More than 50 per cent of the value of international exports through the Port are related to agriculture and food products.

Contribution of the Port to the Australian economy

Table ES 1 and **Figure ES 2** summarises the total economic contribution of the Port of Melbourne to the Australian economy in 2021-22.

Table ES 1 Economic contribution of the Port of Melbourne to the Australian economy, 2021-22

Indicator	Units	Direct	Flow-on		TOTAL
			Production induced	Consumption induced	
Output	A$m	4,004	3,647	3,436	**11,088**
Value-added/GDP	A$m	1,951	1,847	1,816	**5,614**
Per cent of GDP	*%*	*0.085%*	*0.080%*	*0.079%*	***0.243%***
Household income	A$m	780	980	836	**2,596**
Per cent of income	*%*	0.074%	0.093%	0.079%	**0.247%**
Employment	FTE	10,754	9,453	10,136	**30,343**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources

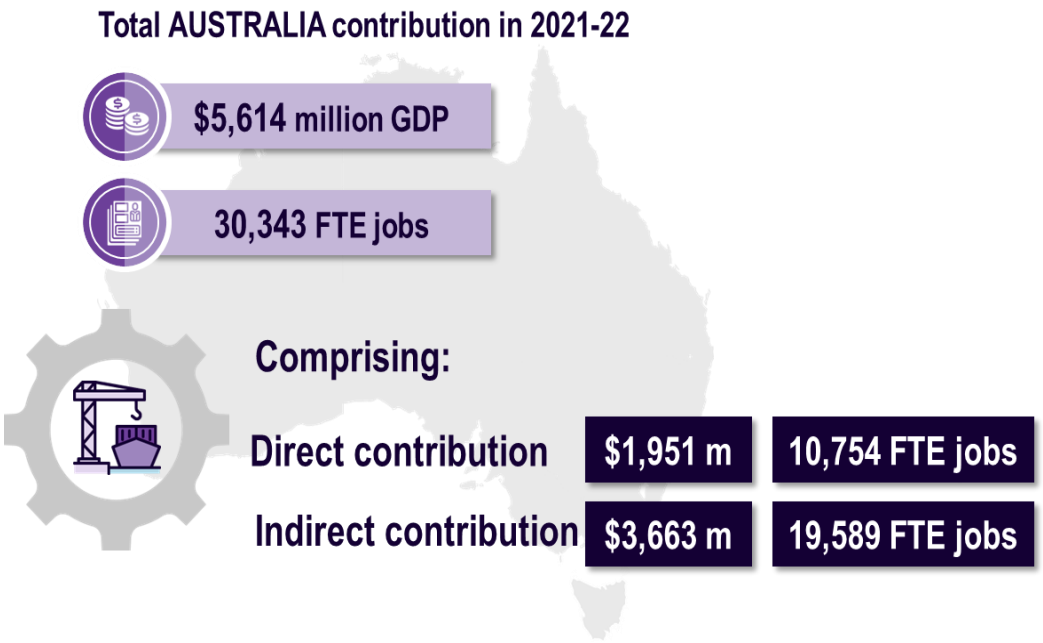
This study estimates that, in 2021-22, the Port of Melbourne contributed:

- A total of **$11,088 million** in revenue to the Australian economy, comprising $4,004 million directly from the port-related activities (directly attributable income) and $7,084 million indirectly from its flow-on effects.
  - The estimated direct revenue of $4,004 million was 3.41 per cent of the value of the international trade through the Port.
  - In 2017-18, the Port contributed a direct revenue contribution of $2,932 million and a total revenue contribution of $7,491 million to the Australian economy.[2]
    - This study estimates an increase of 48 per cent in revenue in current prices over the past four years.
- A total of **$5,614 million** to Australian GDP, comprising $1,951 million directly from the port-related activities (direct value-added) and $3,663 million indirectly from its flow-on effects.
  - The Port contributed a maximum of **0.243 per cent** to Australian GDP in 2021-22.
  - In 2017-18, the Port contributed a direct value-added contribution of $1,510 million and a total of $3,886 million to the Australian economy.
    - This study estimates an increase of 44.5 per cent value-added over the past four years.
- Total employment of **30,343 FTE jobs** throughout Australia, comprising 10,754 FTE jobs directly from the port-related activities and 19,589 FTE jobs indirectly from its flow-on effects.

[2] BDO and GHD (2019), Port of Melbourne, 2017-18 Impact study. Unpublished data provided to ACIL Allen.

- This implies that, in 2021-22, for every 1 million dollars of revenue received by the port service providers due to the Port, there are up to 7.6 FTE jobs directly or indirectly supported throughout the Australian economy.
- In 2017-18, the Port contributed a direct employment contribution of 9,214 FTE jobs and a total employment contribution of 29,773 FTE jobs to the Australian economy.
  - This study estimates an increase of 1.91 per cent in FTE jobs over the past four years.
- In understanding the estimated number of jobs supported by the Port of Melbourne, it should be noted that they are presented as full-time-equivalent jobs for convenience. In reality, they represent the summation of many shares of individual jobs or include part-time and casual jobs. Consequently, the number of people whose employment is supported (partially or wholly) by the activities of the port will be greater than the estimated number of FTE jobs.

Figure ES 2 Total economic contribution of the Port of Melbourne to the Australian economy, 2021-22



Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources.

Contribution of the Port to the Victorian economy

Table ES 2 and **Figure ES 3** summarise the Port's total economic contribution to the Victorian economy in 2021-22. The Port contributed the following:

- A total of **$10,573 million** in revenue to the Victorian economy, comprising $3,770 million directly from the port-related activities (directly attributable income) and $6,804 million indirectly from its flow-on effects.
- A total of **$5,345 million** to Victorian GSP comprising $1,829 million directly from the port-related activities and $3,516 million indirectly from its supply chain activities (flow-on) in Victoria. It contributed a maximum of **1.04 per cent** to Victorian GSP in 2021-22.
- A total employment of **28,902 FTE jobs** throughout Victoria.

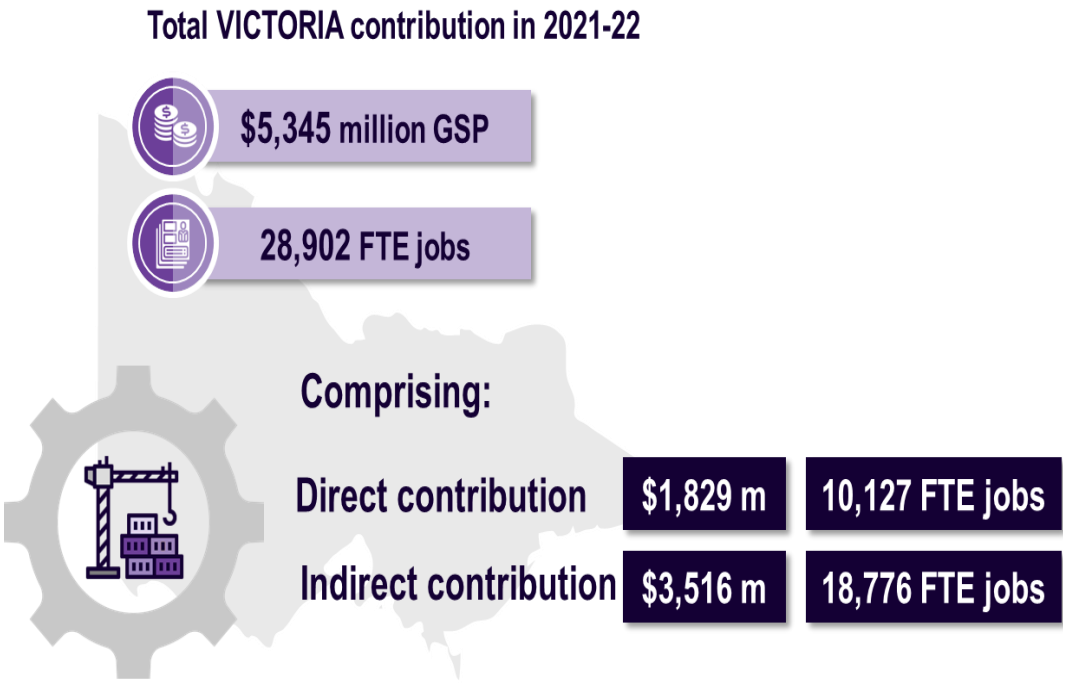
Table ES 2 Economic contribution of the Port of Melbourne to the Victorian economy, 2021-22

Indicator	Units	Direct	Flow-on		TOTAL
			Production induced	Consumption induced	
Output	A$m	3,770	3,493	3,311	**10,573**
Value-added/GSP	A$m	1,829	1,768	1,748	**5,345**
Per cent of GSP	*%*	0.355%	0.343%	0.339%	**1.04%**
Household income	A$m	741	940	806	**2,487**
Employment	FTE	10,127	9,023	9,752	**28,902**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources.

Figure ES 3 Total economic contribution of the Port of Melbourne to the Victorian economy, 2021-22



Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources

Economic contribution by cargo type

Table ES 3 summarises the total (direct and indirect) contributions by cargo type in Australia in 2021-22.

The Port contributed a total of $5,614 million to Australian GDP, comprising $3,731 million from container trade, $575 million from motor vehicles trade, $564 million from break bulk trade, $380 million from liquid bulk trade and $363 million from dry bulk trade.

Table ES 3 Total economic contribution to Australia by cargo type, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Output	A$m	1,115	7,372	717	750	1,134	**11,088**
Value-added/GDP	A$m	564	3,731	363	380	575	**5,614**
Per cent of GDP	*%*	*0.024%*	*0.162%*	*0.016%*	*0.016%*	*0.025%*	***0.243%***
Household income	A$m	262	1,727	168	175	265	**2,596**
Employment	FTE	3,194	19,970	1,998	2,045	3,135	**30,343**

Source: ACIL Allen estimates based on various sources

Table ES 4 summarises the total (direct and indirect) contributions by cargo type in Victoria in 2021-22. The Port contributed a total of $5,345 million to Victorian GSP, comprising $3,587 million from container trade, $521 million from motor vehicles trade, $548 million from break bulk trade, $336 million from liquid bulk trade and $353 million from dry bulk trade.

Table ES 4 Total economic contribution to Victoria by cargo type, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Output	A$m	1,085	7,095	698	665	1,030	**10,573**
Value-added/GSP	A$m	548	3,587	353	336	521	**5,345**
Per cent of GSP	*%*	0.11%	0.70%	0.07%	0.07%	0.10%	**1.04%**
Household income	A$m	255	1,668	164	157	243	**2,487**
Employment	FTE	3,102	19,210	1,940	1,807	2,843	**28,902**

Source: ACIL Allen estimates based on various sources

Economic contribution by port function

Table ES 5 summarises the total (direct and indirect) contribution by port function in Australia in 2021-22. The Port contributed a total of $5,614 million to Australian GDP. It comprises $1,728 million from port-related inland logistic operations, $1,210 million from terminal and cargo stevedoring services, $1,022 million from shipping and cargo support services, $858 million from port administration activities, $694 million from shipping operations, and $101 million from government services.

Table ES 5 Total contribution in Australia by port function, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Output	A$m	2,018	199	3,412	1,698	2,392	1,369	**11,088**
Value-added/GDP	A$m	1,022	101	1,728	858	1,210	694	**5,614**
Per cent of GDP	*%*	*0.044%*	*0.004%*	*0.075%*	*0.037%*	*0.052%*	*0.030%*	***0.243%***
Household income	A$m	473	62	1,063	532	749	320	**3,199**
Employment	FTE	5,927	633	9,845	3,405	6,639	3,894	**30,343**

Source: ACIL Allen estimates based on various sources

Table ES 6 summarises the total (direct and indirect) contributions by port function in Victoria in 2021-22.

The Port contributed a total of $5,345 million to Victorian GSP. It comprises $1,568 million from port-related inland logistic operations, $1,189 million from terminal and cargo stevedoring services,

$988 million from shipping and cargo support services, $858 million from port administration activities, $646 million from shipping operations, and $95 million from government services.

Table ES 6 Total contribution in Victoria by port function, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Output	A$m	1,953	187	3,104	1,698	2,352	1,278	**10,573**
Value-added/GSP	A$m	988	95	1,568	858	1,189	646	**5,345**
Per cent of GSP	%	0.192%	0.018%	0.304%	0.167%	0.231%	0.125%	**1.037%**
Household income	A$m	459	59	972	532	737	301	**3,061**
Employment	FTE	5,727	593	9,029	3,405	6,524	3,625	**28,902**

Source: ACIL Allen estimates based on various sources

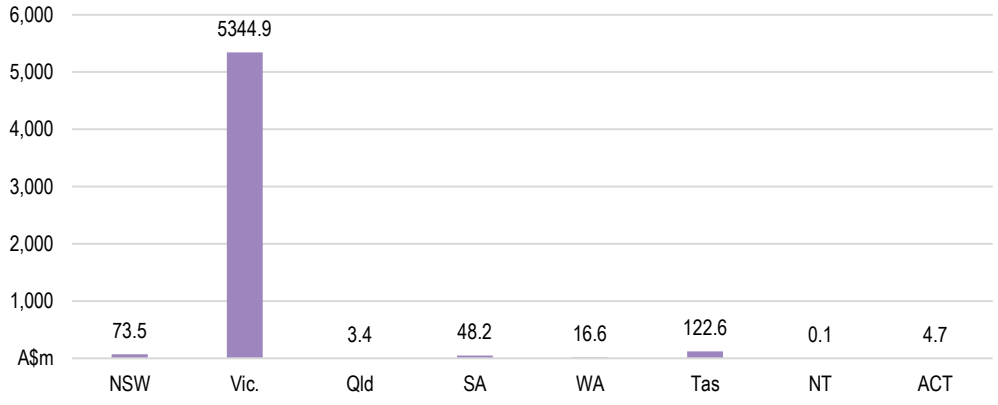
Regional economic contributions

While the Port of Melbourne delivers significantly positive contributions to the Australian economy, given its geographic location, most of the trade and industry contributions added are to the Victorian economy.

Figure ES 4 summarises the total value-added/GSP contribution by state.

During 2021-22, the economic contribution to Australian GDP, including inter-state economic effects from the Port, was $5,614 million. Of which 95 per cent of the Australian total was attributable to the Victorian economy and 2.18 per cent was to Tasmania. The remaining 2.55 per cent was attributable to all other jurisdictions in Australia.

Figure ES 4 Total value-added/GSP contribution by state, 2021-22



Source: ACIL Allen estimates based on various sources

Exports originate from different regions in Victoria, southern New South Wales, western South Australia, Tasmania and other states in Australia. Similarly, imports from the Port go to various

areas. Therefore, different geographic regions contribute differently to the total economic contribution of the Port. **Table ES 7** summarises the Port's contributions by LGA.

The greatest contribution of the Port is to the Melbourne LGA, contributing an estimated $4.5 billion in output, $2.2 billion in value-added, $1 billion in household income, and employment of around 11,245 FTEs.

Table ES 7 Total contribution by LGA/region, 2021-22

LGA/region name	Output	Value-added	Income	Employment	Value-added share
	A$m	A$m	A$m	FTE	%
Melbourne	4,489	2,200	1,020	11,245	39.2%
Port Phillip	1,713	838	391	4,676	14.9%
Hobsons Bay	1,200	659	305	3,428	11.7%
Maribyrnong	873	455	215	2,566	8.1%
Brimbank	417	220	102	1,270	3.9%
Greater Dandenong	269	132	62	779	2.4%
Greater Geelong	170	81	39	477	1.4%
Wyndham	169	95	43	552	1.7%
Hume	142	77	35	451	1.4%
Burnie	132	68	28	391	1.2%
Melton	111	67	30	386	1.2%
Kingston (Vic.)	100	49	23	285	0.9%
Monash	93	42	20	239	0.8%
Knox	75	38	17	215	0.7%
Devonport	64	33	13	194	0.6%
All other	1,071	560	251	3,187	10.0%
Total	**11,088**	**5,614**	**2,596**	**30,343**	**100.0%**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources

Industry flow-on contributions

Table ES 8 summarises the total flow-on (production-induced and consumption-induced effects) by industry in 2021-22.

In terms of industry sectors, the sector contributing the most considerable flow-on effects is "Transport, postal and warehousing". This sector provides essential services which support individuals, businesses and organisations carrying trade from the Port to the destinations. The flow-on effects from this sector were $1,037 million of total output, $488 million of total value-added, $211 million of household income, and employment of 2,609 FTEs.

Table ES 8 Total flow-on contributions by industry, 2021-22

ANZSIC division	Output	Value-added	Income	Employment
	A$m	A$m	A$m	FTE
Transport, postal and warehousing	1,037.3	488.3	210.8	2,609
Rental hiring and real estate services	866.8	473.1	63.2	532
Financial and insurance services	845.1	509.9	171.6	1,446
Professional, scientific and technical services	746.2	410.5	281.0	2,735
Administrative and support services	482.7	320.6	261.1	1,517
Manufacturing	462.4	155.1	87.4	1,084
Construction	425.0	137.0	67.8	998
Retail trade	312.2	187.7	111.2	1,957
Information media and telecommunications	291.6	127.8	44.5	419
Electricity, gas, water and waste services	290.8	85.2	36.1	342
Wholesale trade	230.4	138.6	78.2	560
Other services	199.6	96.7	64.9	1,020
Accommodation and food services	190.3	107.8	67.5	1,278
Health care and social assistance	153.5	107.9	88.5	943
Education and training	140.6	97.3	82.4	857
Agriculture, forestry and fishing	127.6	60.6	11.8	346
Public administration and safety	124.6	71.4	62.7	599
Mining	93.9	59.6	11.1	94
Arts and recreation services	63.2	27.7	14.1	253
Total	**7,083.6**	**3,662.7**	**1,816.0**	**19,589**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimated based on various sources.

As trade continues to grow at the Port of Melbourne, driven mainly by containers with a forecast doubling in the next ten years, the economic impact of the Port on Victoria will also increase.

1 Introduction

1.1 Background

Port of Melbourne Operations Pty Ltd (PoMO) is the private operator of the Port of Melbourne (the Port or PoM). It is responsible for planning, developing and managing the Port (excluding Station Pier). PoMO is a long-term asset owner and manager and is interested in understanding and monitoring the significant economic role which the Port plays within the Victorian and broader south-eastern Australian economies.

PoMO engaged ACIL Allen to undertake a new economic contribution study of the Port of Melbourne (excluding Station Pier) based on the 2021-22 financial year data (this 2021-22 economic impact study).

Similar to the previous studies, this economic contribution study will help PoMO to understand and communicate the economic role and importance of the Port today.

As noted by the Bureau of Transport Economics in 2000,[3] ports are essential for operating an open economy like Australia. They have a central role in the transport of Australia's exports, which provide income and jobs for many Australians, while imports shipped through Australia's ports supply essential inputs for local producers and a wide range of consumer goods. Australia's ports are also used by coastal shipping, which carry large quantities of bulk commodities, and most of the cargo is moved between Tasmania and the mainland.

The operation of a port generates employment and income for the local community, as well as flow-on effects to other local industries. In addition, all levels of government receive revenue from taxes and additional charges for these activities. Port activities also generate pollution (e.g. noise and light) and may contribute to traffic and congestion on local roads.

Port contribution studies can contribute to a balanced assessment of the role of ports and informed consideration of issues such as port planning.

1.2 Port trade activities

The Port of Melbourne handles the full range of port trades, including:

- containers
- liquid bulk
- dry bulk
- break bulk (excluding motor vehicles)
- motor vehicles

[3] https://www.bitre.gov.au/sites/default/files/report_101.pdf

This study estimates the economic contribution of these trade activities separately.

1.3 Port of Melbourne

The definition of the Port of Melbourne in this study includes all assets under PoMO control as of 30 June 2022. The significant assets and facilities of PoMO include the shipping channels and over 30 commercial berths. These facilities service the container, motor vehicle, break bulk cargo, dry bulk, and liquid bulk trades.[4]

The Port of Melbourne owns and manages 510 hectares of port land and 101,242 hectares of declared port waters.[5]

Numerous firms and organisations are involved in Port-related activities, from stevedores to shipping companies, pilots and tug operators to container park operators and inland transport operators.

Figure 1.1 shows the trade catchment for the economic contribution analysis in this study.

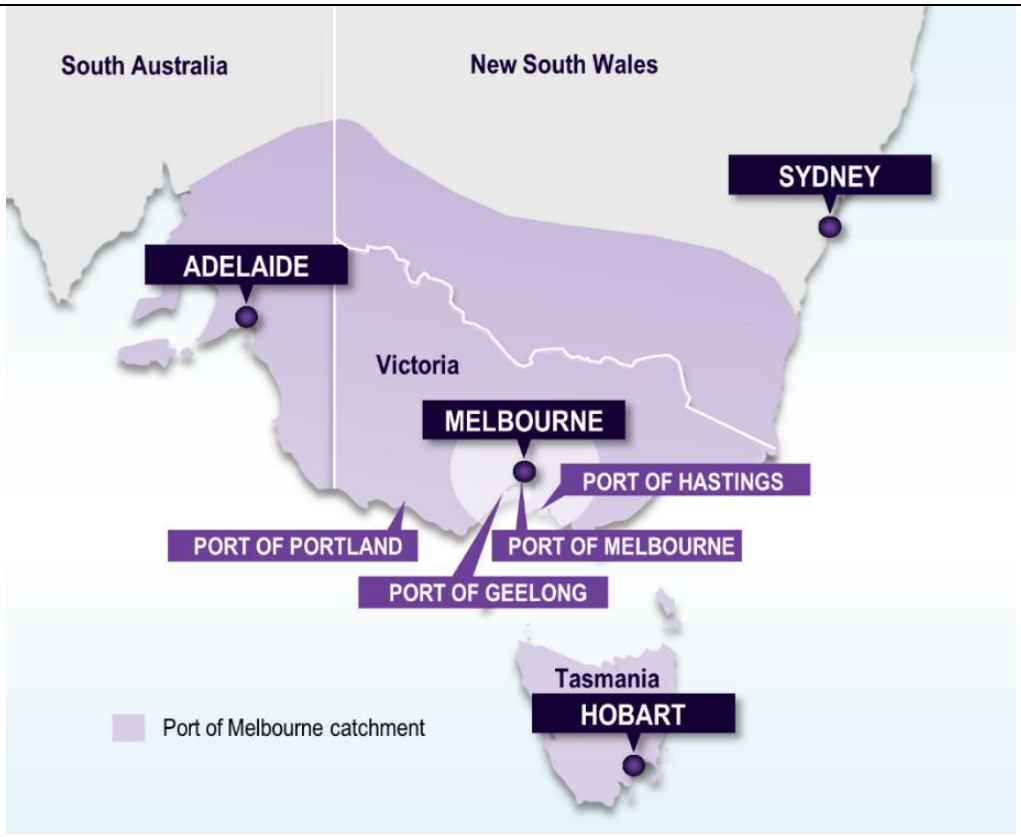
The Port of Melbourne is a trade catchment that extends far beyond Victorian boundaries. With the necessary port facilities and transport connections to handle each significant trade, the Port serves as a vital freight hub for south-eastern Australia (including Tasmania, southern New South Wales, and eastern South Australia).

It covers the whole of Victoria, part of New South Wales, part of South Australia and the whole of Tasmania. This study provides the economic contributions at LGA, state aggregate level and Australian level.

[4] Only cruise liners that call PoM berth are included.

[5] The Port of Melbourne, https://www.portofmelbourne.com/

Figure 1.1 Trade catchment for the Port of Melbourne



Source: Based on PoM RFQ

1.4 Activities and organisations servicing the Port

This study adopts the following definition based on the previous economic contribution studies:[6]

> *Port-related activity is the activity undertaken by organisations in moving cargo through the Port of Melbourne and in providing goods and services directly to facilitate cargo movement through the port.*

This definition includes organisations that provide maritime services, such as transport firms, stevedoring companies and shipping agents. However, this definition excludes manufacturing firms, distributors and retailers that import and export goods through the Port during their business. Activities of these businesses are considered indirectly in estimating the economic impact in this study.

1.4.1 Port administration

The Port administration function comprises general port management and operations. The tasks carried out by the PoMO include:

- Planning, co-ordination and promotion
- Land and property management
- Safety and emergency response
- Port maintenance and maintenance dredging
- Waste disposal

[6] GHD and Econsearch (2010), Economic Impact Study of the Port of Melbourne (2007/08 to 2008/10).

— Shipping channels and navigation aids.

1.4.2 Terminal and cargo stevedoring operations

Third parties mainly perform terminal and cargo stevedoring operations at the Port of Melbourne, but PoMO does operate several common-user facilities:

— Swanson Dock international container terminal operations are carried out by the stevedoring companies Patrick Terminals (at Swanson Dock East) and DP World (at Swanson Dock West). VICT automated container terminal operates at Webb Dock East.
— Appleton Dock, Victoria Dock, and Webb Dock West carry general cargo operations at the Port.
— MIRRAT does Automotive Roll On / Roll Off (Ro/Ro) operations at Webb Dock West.
— PoMO carries out dry bulk operations. AAT also do ad hoc dry bulk at Appleton dock.
— PoMO Liquid bulk berths are currently located at Holden Dock (Yarraville), Gellibrand Pier (Williamstown) and Maribyrnong (Coode Island). Liquid bulk includes crude oil, petroleum products, chemicals and other liquids. The port is also serviced by the existing Victoria bulk liquid pipeline networks with key Port berths being directly connected to the Victoria's refined petroleum product storage and distribution facilities.

The third-party terminal and cargo stevedoring operators are also tenants of PoMO providing the Port with land fees revenue.

1.4.3 Shipping services

Global shipping companies either have offices in Melbourne or employ local shipping agents. They provide container, break bulk, Roll-on/Roll-off (Ro-Ro), and bulk shipping connections to a worldwide network of ports (including domestic ports).

Container services are provided by companies such as ANL, Maersk Line and MSC. Automotive Ro-Ro services are provided by operators such as WWL, and K-Line. Bulk shipping operations are provided by operators such as Gearbulk (dry bulk/break bulk) and Stolt (tankers).

1.4.4 Shipping and cargo support services

There are numerous operations and services at the Port supporting the movement of shipping and cargo:

— Port Phillips Sea Pilots provide pilotage.
— Svitzer Australia provide towage.
— Ausport Marine, Melbourne Port Services, and Steve Turner Marine provide line boats for the mooring and unmooring of vessels.
— Skilled Maritime Services and Melbourne Port Services provide linesmen for the mooring and unmooring of vessels.
— Freight forwarders and Customs Brokers/Agents.

1.4.5 Government agencies

Commonwealth government agencies are all active at the Port of Melbourne, including:

— Australian Customs Service (ACS)
— Office of Transport Security (OTS)
— Australian Quarantine and Inspection Service (AQIS)
— Australian Maritime Safety Authority (AMSA)

There are several Victorian government agencies interact with the Port of Melbourne and the various organisations involved in port-related activities, including:

- The Department of Transport (DoT)
- Department of Planning and Community Development (DPCD)
- Department of Business and Innovation (DBI)
- Regional Development Victoria (RDV)
- Environment Protection Agency (EPA)

1.4.6 Port-related inland logistics operations

Port-related inland logistics operations service an inland road and rail network for freight moving to and from the Port. These third-party operations include:

- container park operators (a total of ten independent operators)
- intermodal hub operators (metropolitan, regional Victoria, and inter-state)
- rail operators, such as Pacific National and SCT
- numerous trucking/cartage operators with major firms, such as Qube, ACFS and many small road operators, often work as sub-contractors.

1.5 Methodology

The methodology employed in this study is similar to that of previous economic contribution studies related to the Port of Melbourne. This study provides the economic contribution of port-related activity at the LGA, state and national levels.

This study provides output, value-added, household income and employment metrics.

The estimates in this study include the direct contributions and the subsequent flow-on contributions to the other economic sectors using interregional input-output multiplier analysis.

Appendix A provides a detailed input-output methodology to estimate the flow-on contributions.

Table 1.1 summarises impact estimates disaggregation in this study.

Table 1.1 Economic contribution location and indicator

Regions	Port activity disaggregation	Indirectly impacted sectors	Economic indicators
States and Territories – New South Wales – Victoria – Queensland – South Australia – Western Australia – Tasmania – Northern Territory – Australian Capital Territory **Local Government Areas 2021** – All LGAs in Victoria – All LGAs in Tasmania – LGAs in Southern New South Wales – LGAs in Eastern South Australia	**Port Function** – Port administration – Ship operations – Ship loading unloading – Cargo services – Land transport and storage – Government agencies **Pack type** – Containers – Break bulk and other (excl. MVs) – Motor vehicles – Liquid bulk – Dry bulk	– Agriculture, Forestry and Fishing – Mining – Manufacturing – Electricity, Gas, Water and Waste Services – Construction – Wholesale Trade – Retail Trade – Accommodation and Food Services – Transport, Postal and Warehousing – Information Media and Telecommunications – Financial and Insurance Services	– Output – Employment – Household Income – GRP **Components of indicators** 1. Direct 2. Production induced. 3. Consumption induced. 4. Flow on (2+3) Total (1+4)

Regions	Port activity disaggregation	Indirectly impacted sectors	Economic indicators
		– Rental, Hiring and Real Estate Services – Professional, Scientific and Technical Services – Administrative and Support Services – Public Administration and Safety – Education and Training – Health Care and Social Assistance – Arts and Recreation Services – Other Services	

Source: PoMO

1.6 Report structure

The structure of the report follows the steps in the methodology.

Chapter 1 is an introduction chapter about the aims and objectives of the study and some background information about the Port.

Chapter 2 provides trade and service provider data analysis. This chapter also provides data on port functions and activities through a survey and ACIL Allen data assembly.

Chapter 3 provides an economic contribution assessment at the Australian level and Victoria level.

Chapter 4 provides the Port of Melbourne's direct, indirect and total contribution to the Australian and Victorian economies at an aggregate level by trade pack type.

Chapter 5 provides the Port of Melbourne's direct, indirect and total contribution to the Australian and Victorian economies at an aggregate level by port function.

Chapter 6 provides geographic (LGA level) direct, indirect and total contributions of the Port of Melbourne.

Chapter 7 provides flown on the contribution of the Port of Melbourne to industries that support port functions and trade.

Trade and service providers' data 2

ACIL Allen used several data sources to estimate the direct and indirect contribution of the Port of Melbourne to the Australian and Victorian economies and regions in 2021-22.

2.1 Trade volume data

Aggregate trade volume data is available from the Port website.

PoMO also provided detailed unpublished data on the origin and destination of trade flows by the state of origin and the state of destination. This data is not recorded at the LGA level.. ACIL Allen estimated the LGA data for exports and LGA data for imports based on ACIL Allen LGA input-output tables and the volume data provided by the PoMO at the aggregate state level.

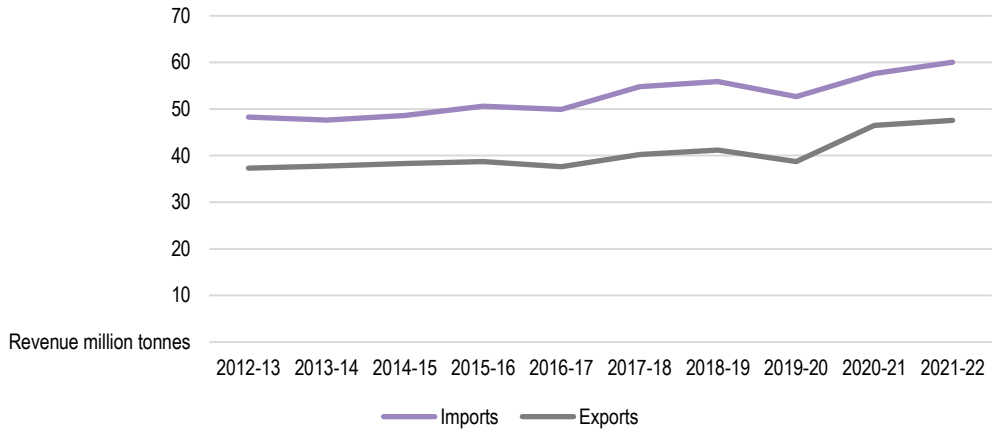
PoMO also provided data on shipping traffic.

2.1.1 Trade at the Port

Figure 2.1 provides total historical trade in revenue tonnes.[7]

Total port trade grew by over 25 per cent over the past ten years to 2021-22. Total trade through the Port of Melbourne for 2021-22 increased by 3.3 per cent over the previous financial year to a record 107.6 million revenue tonnes. Total imports increased by 4.2 per cent to 60 million revenue tonnes, and total exports increased by 2.3 per cent to 47.6 million revenue tonnes.

Figure 2.1 Total trades at the Port of Melbourne, 2012-13 to 2021-22



Source: PoM, https://www.portofmelbourne.com/about-us/trade-statistics/historical-trade-data/

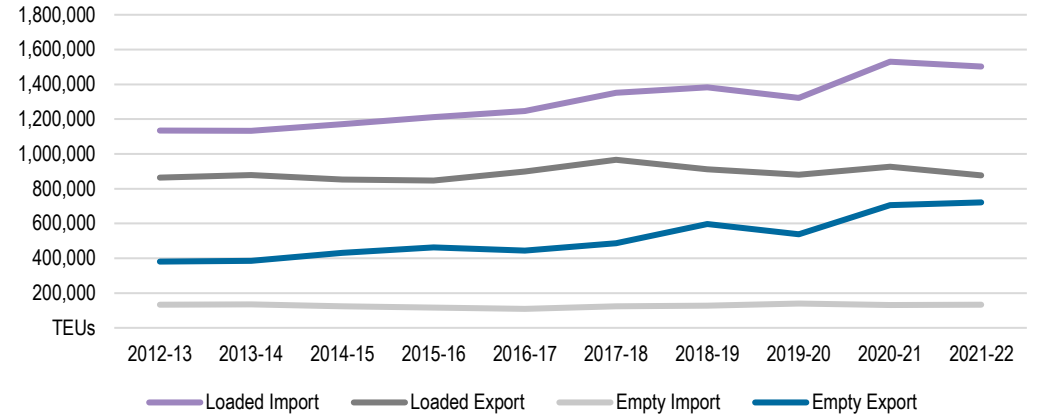
[7] Revenue tonnes is a quantity measure commonly used for port throughput and is the greater of the cargo weight (in mass tonnes) and volume (in cubic metres).

Figure 2.2 shows historical trends in container trade over the past ten years.

Total container throughput for the 2021-22 financial year was 3.23 million TEU, representing a 1.9 per cent decrease over the 3.29 million TEU recorded in the 2020-21 financial year.

Full containers decreased by 3.2 per cent, with imports and exports down 1.4 per cent and 6.0 per cent, respectively, while empty container movements increased by 2.0 per cent to 854,000 TEU.

Figure 2.2 Container trade at Port of Melbourne, 2012-13 to 2021-22



Source: PoM, https://www.portofmelbourne.com/about-us/trade-statistics/historical-trade-data/

Figure 2.3 provides imports and exports of non-container trade at the Port of Melbourne.

Structural changes in the economy impacting the trade patterns.

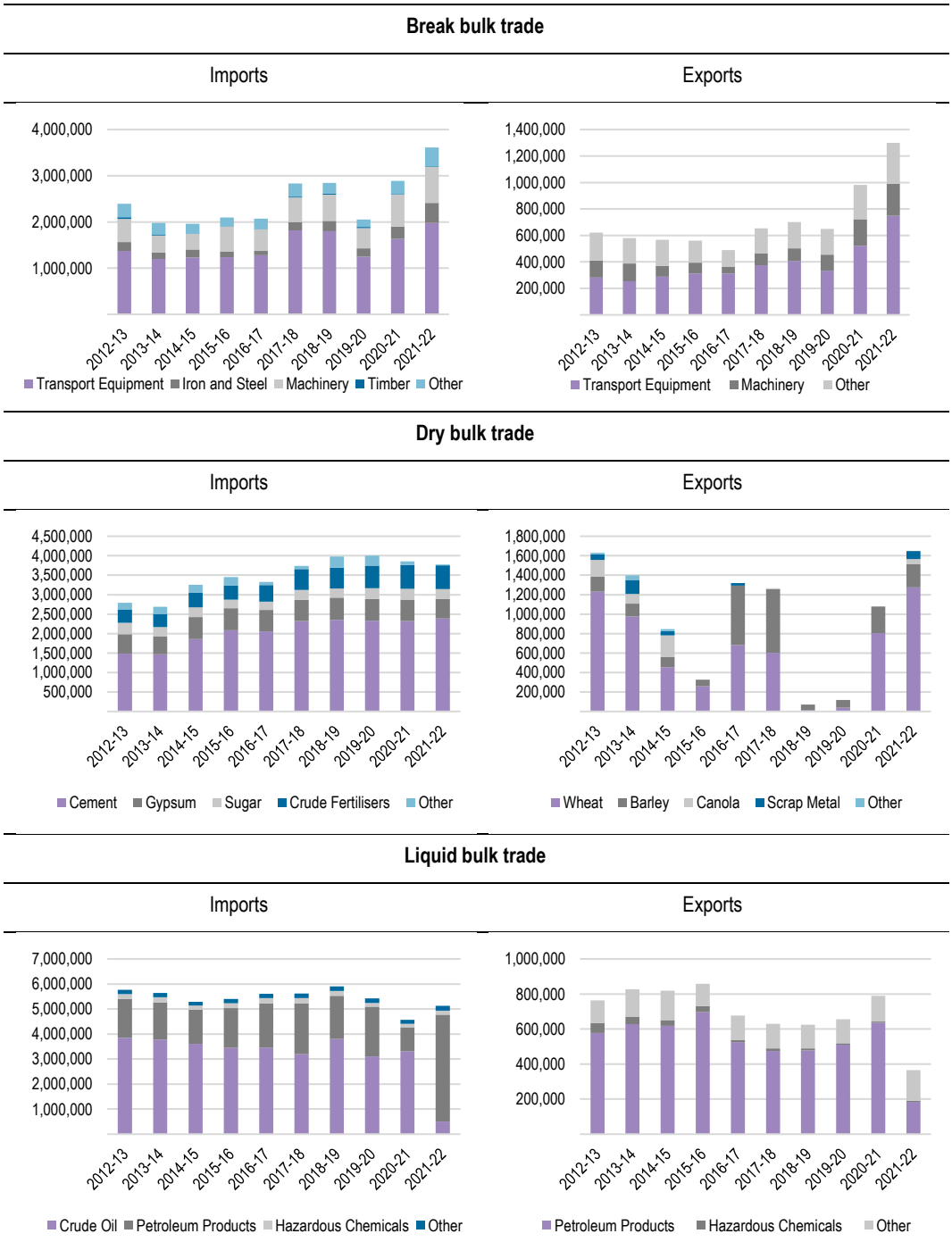
Trade patterns at the Port reflect the structural changes in the Victorian and Australian economies and recent COVID-related impacts.

New motor vehicle trade increased 10.3 per cent in 2021-22 to 4.8 million revenue tonnes, which equated to 328,825 units. Imports rose 8.5 per cent, and exports gained 21.2 per cent.

Liquid bulk increased 2.5 per cent to 5.5 million revenue tonnes (4.4 million mass tonnes), with crude oil and petroleum product imports accounting for almost 87 per cent of the total 2021-22 liquid bulk trade. The Mobil Altona refinery ceased operation permanently in August 2021 and converted to an import terminal for refined petroleum products. The easing of COVID-19-related restrictions on international travel and state border closures in late 2021 increased demand for petroleum-based fuels, contributing to the overall annual increase in total liquid bulk trade in 2021-22.

Dry bulk trade for 2021-22 increased by 10.0 per cent over 2020-21 to 5.4 million revenue tonnes (5.1 million mass tonnes). This increase was entirely attributable to the export sector, which increased 53 per cent to 1.6 million revenue tonnes due predominantly to increased grain shipments following another above-average winter crop in 2021-22. The import sector declined 2 per cent to 3.8 million revenue tonnes, with volumes of raw sugar, gypsum and fertilizers below 2020-21 levels.

Figure 2.3 Non-container trade at Port of Melbourne, Revenue tonnes, 2012-13 to 2021-22



Source: PoM, https://www.portofmelbourne.com/about-us/trade-statistics/historical-trade-data/

The container trade is the most significant Port of Melbourne trade, with around 3.23 million TEU of containers handled during 2021-22 (equating to approximately 83.5 million revenue tonnes). The following two most significant port trades during 2021-22 were break bulk (9.7 million revenue tonnes) and liquid bulk (5.5 million revenue tonnes), with more than two-thirds of the breakbulk volumes related to motor vehicle imports and exports.

2.1.2 The Port's throughput

Table 2.1 summarises the trade volume in mass tonnes through the Port of Melbourne in 2021-22.

Throughput in mass tonnes increased by 1.4 per cent in 2021-22 relative to 2017-18. The trade volume increase is mainly due to the increased volumes of break bulk (96.6 per cent), wheeled units (34.4 per cent), dry bulk (10.1 per cent), and motor vehicles (6.7 per cent).

Table 2.1 Trade throughput at the Port of Melbourne (mass tonnes), 2017-18 to 2021-22

Year	Container	Wheeled units	Motor vehicles	Break bulk	Dry bulk	Liquid bulk	Total
2017-18	26,564,591	634,757	844,252	433,827	4,651,101	5,092,347	38,220,875
2018-19	25,600,190	681,109	787,917	474,243	3,979,318	5,399,645	36,922,422
2019-20	24,908,250	697,863	621,342	380,791	4,052,639	4,982,471	35,643,356
2020-21	27,300,410	725,116	777,803	554,254	4,695,484	4,397,417	38,450,484
2021-22	26,597,475	852,898	900,822	852,860	5,120,429	4,430,279	38,754,763
% Change 2017-18	0.12	34.4	6.7	96.6	10.1	-13.0	1.40

Source: PoMO.

2.1.3 Source and destination of trade

The Port of Melbourne is a trade gateway for Australia's south-east.

Table 2.2 provides the origin and destination of trade volumes between Australian states and international markets using the Port of Melbourne. The rows show the source of trade, and the column show the final destination of the traded goods in 2021-22. These trade volumes include both exports and imports. For example, trade (exports and imports) from Victoria to New South Wales as the final destination using the Port of Melbourne is 12,616 mass tonnes. Similarly, from Victoria to Tasmania as the final destination using the Port of Melbourne is 2,210,698 mass tonnes, ten times higher than the trade with New South Wales. International trade destined for various final destinations through the Port of Melbourne are:

- Victoria: 16,603,872 mass tonnes (93.64% of international trade)
- Queensland: 291,517 mass tonnes (1.64% of international trade)
- South Australia: 265,209 mass tonnes (1.5% of international trade)
- Western Australia: 234,049 mass tonnes (1.32% of international trade)
- Tasmania: 92,131 mass tonnes (0.52% of international trade)
- New South Wales: 87,901 mass tonnes (0.5% of international trade)

Table 2.2 Trade through the Port of Melbourne (mass tonnes), 2021-22

		NSW	Vic.	Qld	SA	WA	Tas.	NT	Overseas	Total
Mass tonnes		DESTINATION								
ORIGIN	NSW	-	97,415	307	4,135	1,985	2,995	-	57,350	164,187
	Vic.	12,616	9,310	35,920	25,660	306,814	2,210,698	-	12,143,122	14,744,140
	Qld	-	899,819	-	318	-	236	-	89,024	989,397
	SA	-	1,392,557	3,176	-	100	52	-	111,474	1,507,359
	WA	123	16,488	60	-	-	1,881	-	94,675	113,227
	Tas.	4,296	3,287,941	16,165	36	12,307	117	52	183,898	3,504,812
	Overseas	87,901	16,603,872	291,517	265,209	234,049	92,131	136	156,826	17,731,641
	Total	104,936	22,307,402	347,145	295,358	555,255	2,308,110	188	12,836,369	38,754,763

Note: Small intrastate trade was reported in 2021-22, suggesting cargo movements between ports within the state.
Source: PoMO

This trade happens through ocean, road or rail transport from and to the Port of Melbourne.

2.1.4 Ship visits

Table 2.3 summarises shipping traffic data at the Port of Melbourne. It shows vital trends in shipping traffic by vessel type.

Over the past five years, the number of ship visits declined, but vessels have grown larger to transport more cargo on each trip:

— In 2017-18, 3,296 vessel visits to the Port brought 38.2 million mass tonnes of cargo.

— In 2021-22, 2,918 vessel visits to the Port brought 38.8 million mass tonnes of cargo.

With 378 fewer visits, vessels have carried an additional 533,888 mass tonnes of cargo – a further 1,685 mass tonnes per vessel.

With the increasing container trade, container vessels are growing in size and capacity. Larger container vessels gradually account for a more significant share of visits as their smaller counterparts decrease.

The average size of a container vessel in 2008-09 was 2,653 TEU, compared with 4,582 TEU last year.

In terms of vessel visits, container vessels continue to account for the most significant number of visits, with 918 visits to the Port in 2021-22.

Vehicle Carriers accounted for 358 visits.

Larger vessels offer economies of scale, meaning more trade can be handed with fewer ship visits.

Table 2.3 Ship visits at the Port of Melbourne, 2017-18 to 2021-22

	2017-18	2018-19	2019-20	2020-21	2021-22
Container	1,099	1,057	949	914	918
Conventional	41	43	27	38	34
Dry Bulk	286	239	244	257	275
Liquid Bulk (incl Gas)	234	225	226	213	239
Passenger	541	546	531	404	417
RORO[a]	624	634	623	622	617
Vehicle Carrier	409	384	315	352	358
Other non-commercial	62	66	104	71	60
TOTAL	**3,296**	**3,194**	**3,019**	**2,871**	**2,918**

[a] Roll-on/roll-off (RORO or Ro-Ro) ship is designed to carry wheeled cargo, such as cars, motorcycles, trucks, semi-trailer trucks, buses, trailers, and railroad cars. They are driven on and off the ship on their wheels or using a platform vehicle, such as a self-propelled modular transporter.

Source: PoMO

2.2 Trade value data

ACIL Allen obtained the value of exports and imports through the Port of Melbourne from the ABS for the financial year 2021-22.

The Port handled 86 per cent value of total Victorian-origin exports and 87.6 per cent of the value of Victorian international imports in 2021-22.

Table 2.4 provides the value of imports by commodity type based on the ABS Harmonized Commodity Description and Coding System.

Imports of machinery and vehicles constitute around 36 per cent of the value of imports at the Port, followed by chemicals and fertilizers (12 per cent) and clothing and footwear (9 per cent).

Table 2.4 CIF value of imports at the Port of Melbourne, 2021-22

Import category	Value (A$m)
Animal products	1,609
Vegetable products, animal, vegetable or microbial fats and oils and their cleavage products; prepared edible fats animal or vegetable waxes	2,106
Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes; products containing nicotine	5,241
Mineral products	80
Products of the chemical or allied industries	10,608
Plastics and articles thereof; rubber and articles thereof	4,433
Raw hides and skins, leather, fur skins and articles thereof; saddlery and harness, travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)	303
Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork	1,524
Pulp of wood or of other cellulosic material, recovered (waste and scrap) paper and paperboard, and articles thereof	1,676
Textiles and textile articles, footwear, headgear, umbrellas, sun umbrellas, walking-sticks, whips, riding-crops, and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles made of human hair	8,396
Articles of stone, plaster, cement, asbestos, mica or similar materials, ceramic products, glass and glassware	1,407
Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin	117
Base metals and articles of base metal	3,981
Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	16,134
Vehicles, aircraft, vessels and associated transport equipment	16,299
Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof	962
Arms and ammunition; parts and accessories thereof	5,169
Miscellaneous manufactured articles	983
Works of art, collectors' pieces and antiques; special transactions and commodities not classified according to kind; commodities and transactions not included in merchandise trade	8,648
Total	**89,675**

Note: CIF is the price of a good delivered at the port, including insurance and freight charges

Source: ABS unpublished data, special data request

Table 2.5 provides the value of exports by commodity type based on the ABS Harmonized Commodity Description and Coding System.

More than 50 per cent of the value of exports from the Port to international destinations are related to agriculture and food products:

— Animal products (29%)

— Vegetables, crop products and animal fats (13%)

— Prepared foodstuff (9%)

Exports of base metals constitute around 12 per cent of the value of exports from the Port, followed by clothing and footwear (8 per cent).

Table 2.5 FOB value of exports from the Port of Melbourne, 2021-22

Export category	Value (A$m)
Animal products	8,084
Vegetable products, animal, vegetable or microbial fats and oils and their cleavage products; prepared edible fats animal or vegetable waxes	3,609
Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes; products containing nicotine	2,457
Mineral products	817
Products of the chemical or allied industries	1,661
Plastics and articles thereof; rubber and articles thereof	445
Raw hides and skins, leather, fur skins and articles thereof; saddlery and harness, travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut)	335
Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basket ware and wickerwork	73
Pulp of wood or of other cellulosic material, recovered (waste and scrap) paper and paperboard, and articles thereof	580
Textiles and textile articles, footwear, headgear, umbrellas, sun umbrellas, walking-sticks, whips, riding-crops, and parts thereof; prepared feathers and articles made therewith; artificial flowers; articles made of human hair	2,206
Articles of stone, plaster, cement, asbestos, mica or similar materials, ceramic products, glass and glassware	75
Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewellery; coin	42
Base metals and articles of base metal	3,209
Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	1,499
Vehicles, aircraft, vessels and associated transport equipment	1,010
Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments; parts and accessories thereof	101
Arms and ammunition; parts and accessories thereof	19
Miscellaneous manufactured articles	210
Works of art, collectors' pieces and antiques; special transactions and commodities not classified according to kind; commodities and transactions not included in merchandise trade	1,225
Total	**27,658**

Source: ABS unpublished data, special data request

2.3 Port user data

A survey of Port of Melbourne users, service providers and other organisations interacting with the Port was carried out by ACIL Allen in November and December 2022. The survey collected data on cargo movements through the Port and the associated employment, revenue and expenditure.

PoMO provided contact details for 151 organisations.

An introductory email from Port of Melbourne was sent to each organisation, followed by invitations by ACIL Allen to participate through an electronic or paper questionnaire or an interview over the phone or face-to-face.

ACIL Allen received a total of 19 responses.

Gaps in the survey data were filled using other data sources and by imputing values for an unsurveyed organisation using similar surveyed ones.

ACIL Allen validated the revenue data from Australian Tax Office (ATO) postcode data. The imputed data suggests that the direct revenue estimates in this study are an approximation.

Table 2.6 summarises the estimated port function revenue and employment directly attributable to the Port of Melbourne in 2021-22.

Table 2.6 Estimated direct revenue and employment by port function, 2021-22

Port function	Directly attributable revenue (A$m)	Directly attributable employment (FTE)
Port administration	611	401
Terminal and cargo stevedoring services	862	2,408
Shipping services	495	1,478
Shipping and cargo support services	728	2,360
Port-related inland logistic operations	1,235	3,826
Government agencies	72	281
Total	**4,004**	**10,754**

Source: ACIL Allen estimates based on survey data and other various sources

2.4 Origin and destination modelling

The origin and destination modelling for the container trade in this study is based on the 2020 Port of Melbourne Container Logistics Chain Study, which provided information on inland container movements to and from the Port of Melbourne for the 2019 calendar year. The study is an update of the previous 2009 Study, which was widely recognised as providing industry and Government with a valuable resource in understanding container logistics, particularly around Metropolitan Melbourne and throughout regional Victoria. PoMO commissioned the Container Logistics Chain Study, and the Victoria State Government Department of Transport (DoT) with GHD Advisory (GHD) was engaged in gathering and analysing industry data on container movements for 2019.[8]

Broadly, the container logistics chain covers the following:

— The movement of imported goods from arrival at the Port to importers' container unpacking locations for further distribution or use; and

— The movement of export goods from exporters' container packing locations in urban or rural areas to the Port for loading onto vessels.

The Container Logistics Chain Study results provide insights into the current workings of the Port of Melbourne's landside container logistics chain and how this has changed since the previous study in 2009.

Understanding and measuring the landside component of container logistics support effective policy decision-making and the planning of infrastructure development with alignment to industry needs.

The origin and destination data from the Container Logistics Chain Study are used to proxy for the container trade and business type with the 2021-22 container data for this economic contribution assessment.

[8] https://www.portofmelbourne.com/news-publications/publications/2020-logistics-study/

This study used the exact unpacking locations for imports and the same packing locations for exports with the 2021-22 container data.

The calibrated data summarised in **Table 2.7** shows a total of 1,503,252 TEU of international and mainland coastal import containers (excluding empty and transhipments), of which 94 per cent were handled and unpacked in metropolitan Melbourne, 3.8 per cent in regional Victoria and 2.2 per cent in interstate.

The estimates show a total of 875,841 TEU of international and mainland coastal export containers (excluding empty and transhipments), of which 63.9 per cent were handled and unpacked in metropolitan Melbourne, 26.8 per cent in regional Victoria and 9.3 per cent in interstate.

Table 2.7 Port of Melbourne full international and mainland coastal import and export container origins and destinations, 2021-22

Area	Imports		Exports	
	TEU	%	TEU	%
Inner Melbourne	108,234	7.2%	65,688	7.5%
Outer Eastern	111,241	7.4%	30,654	3.5%
Outer Northern	234,507	15.6%	65,688	7.5%
Outer South East	399,865	26.6%	100,722	11.5%
Outer Western	559,210	37.2%	296,910	33.9%
Metropolitan Total	**1,413,057**	**94.0%**	**559,663**	**63.9%**
Eastern Corridor	7,516	0.5%	30,654	3.5%
Goulburn Corridor	4,510	0.3%	8,758	1.0%
Hume Corridor	7,516	0.5%	2,628	0.3%
North Western Corridor	9,020	0.6%	68,316	7.8%
Peninsula	3,007	0.2%	4,379	0.5%
South Western Corridor	21,046	1.4%	91,963	10.5%
Western Corridor	4,510	0.3%	28,027	3.2%
Regional Victoria Total	**57,124**	**3.8%**	**234,725**	**26.8%**
New South Wales & ACT	22,549	1.5%	63,936	7.3%
Northern Territory	0	0.0%	0	0.0%
Queensland	3,007	0.2%	876	0.1%
South Australia	6,013	0.4%	12,262	1.4%
Western Australia	1,503	0.1%	4,379	0.5%
Interstate Total	**33,072**	**2.2%**	**81,453**	**9.3%**
Grand Total	**1,503,252**	**100.0%**	**875,841**	**100.0%**

Source: ACIL Allen estimates based on the 2020 Port of Melbourne Container Logistics Chain Study

The calibrated data summarised in **Table 2.8** shows the full import mainland destinations for containers shipped from Tasmania and mainland export container origins for containers shipped to Tasmania through the Port of Melbourne.

Table 2.8 Port of Melbourne Tasmanian full import destinations and export container origins on mainland Australia, 2021-22

Area	Imports		Exports	
	TEU	%	TEU	%
Inner Melbourne	26,666	31.9%	26,028	23.4%
Outer Eastern	176	0.2%	1,047	0.9%
Outer Northern	5,886	7.0%	9,159	8.2%
Outer South East	14,971	17.9%	11,246	10.1%
Outer Western	30,439	36.4%	42,615	38.3%
Metropolitan Total	**78,138**	**93.4%**	**90,095**	**81.1%**
Eastern Corridor	108	0.1%	77	0.1%
Goulburn Corridor	4	0.0%	670	0.6%
Hume Corridor	7	0.0%	0	0.0%
North Western Corridor	2	0.0%	1,319	1.2%
Peninsula	0	0.0%	25	0.0%
South Western Corridor	377	0.4%	9,522	8.6%
Western Corridor	9	0.0%	1,308	1.2%
Regional Victoria Total	**506**	**0.6%**	**12,920**	**11.6%**
New South Wales & ACT	3,310	4.0%	3,232	2.9%
Northern Territory	4	0.0%	0	0.0%
Queensland	1,565	1.9%	3,449	3.1%
South Australia	124	0.1%	617	0.6%
Western Australia	40	0.0%	825	0.7%
Interstate Total	**5,043**	**6.0%**	**8,123**	**7.3%**
Grand Total	**83,687**	**100.0%**	**111,138**	**100.0%**

Source: ACIL Allen estimates based on the 2020 Port of Melbourne Container Logistics Chain Study

Of the 83,687 TEU Tasmanian full import containers, 93.4 per cent were unpacked in metropolitan Melbourne, 6 per cent interstate and 0.6 per cent in regional Victoria. For the 123,651 TEU Tasmanian full export containers, 81.3 per cent were packed in metropolitan Melbourne, 10.7 per cent in regional Victoria and 8.0 per cent interstate.

2.5 Other data

ACIL Allen developed LGA input-output tables based on several ABS published data sources to estimate the LGA-level contributions. They include:

- ABS 2021 Census of Population and Housing
- Australian System of National Accounts 2021-22
- Australian System of State Accounts 2021-22
- Australian National Accounts: Input-Output Tables
- Australian National Accounts: Input-Output Tables (Product Details)
- 2020-21 Agricultural Census
- Labour Force, Australian Industry, State Government Departments
- Others

3 The footprint of the Port of Melbourne

3.1 Introduction

This chapter summarises economic contributions at the Australian and state levels. The estimates include output (gross revenue of total expenditure), value-added (payments to labour and capital), household wage income and employment.

In interpreting the estimates provided in this study, several aspects must be considered. They are:

- The total economic contribution is the sum of the economy's direct and flow-on effects.
- Revenue is an important indicator of measuring the economic impact due to its duality, and it double counts the estimated contributions. ACIL Allen suggests that PoMO can only use this measure within the context of this report.
- The economic impact is measured through the direct and flow-on effects of the value-added indicator. The value-added includes payments to the primary factors employed in the Port services and the economy. This indicator can be directly compared to GDP, GSP, or LGA value-added. It avoids the problem of double counting in providing the economic impact of the Port.
- This study provides an analysis of the economic contribution of the Port of Melbourne from a whole port perspective (excluding Station Pier).

3.2 Australian contribution

Table 3.1 summarises the total Australian direct and flow-on contributions of the Port in 2021-22.

Table 3.1 Economic contribution of the Port of Melbourne to Australia, 2021-22

Indicator	Units	Direct	Flow-on		TOTAL
			Production induced	Consumption induced	
Output	A$m	4,004	3,647	3,436	**11,088**
Value-added/GDP	A$m	1,951	1,847	1,816	**5,614**
Per cent of GDP	*%*	0.085%	0.080%	0.079%	**0.243%**
Household income	A$m	780	980	836	**2,596**
Per cent of income	*%*	0.074%	0.093%	0.079%	**0.247%**
Employment	FTE	**10,754**	**9,453**	**10,136**	**30,343**

Source: ACIL Allen estimates based on various sources

3.2.1 Direct contribution

The estimated direct revenue associated with the Port of Melbourne in Australia in 2021-22 was $4,004 million.

The direct value-added embodied within this revenue is estimated to have been **$1,951 million**, mainly comprising pre-tax returns to industry owners and compensation of employees.

In 2021-22, Australian GDP was $2,309 billion, implying that the direct value-added contribution of the Port to the Australian economy accounts for 0.085 per cent of Australia's 2021-22 GDP.

The direct income embodied within this revenue is estimated to have been **$780 million**.

In 2021-22, Australian wage factor income was $1,052 billion, implying that the direct income contribution of the Port to the Australian economy accounts for 0.074 per cent of Australia's 2021-22 labour income.

The direct FTE related to the activities at Port of Melbourne in Australia is estimated to have been **10,754 FTE jobs**.

3.2.2 Flow-on contribution

The direct value-added contribution is limited to the initial activity of the port operations. However, purchasing intermediate inputs or spending on incomes made from port-related activities will lead to further flow-on contributions.

In addition to the direct value-added generated from the port-related activities, there are two indirect channels through which the Port contributes indirectly to the economy. These are:

— *Purchases of intermediate inputs by industry*: In undertaking port functions, the businesses purchase goods and services from various other companies to provide their port functions, e.g., diesel, electricity use, other related activities within the sector, or services from different sectors. These purchases create demand for those services and stimulate the region's economic activity (*production-induced effect*).

— *Employees spending*: The employees spend their wages on purchasing goods and services in the region. This spending generates additional economic activity (*consumption-induced effect*).

As discussed in **Appendix A**, the above two effects are captured by the supply chain information embodied in input-output tables (and the associated 'input-output multipliers') of the Australian and state economies. The indirect economic contribution can be measured using the relevant multipliers. Based on information from the ABS, ACIL Allen has developed (and regularly updates) detailed input-output tables for Australia and each state and territory (along with various regional areas, when necessary). From these tables, ACIL Allen has calculated a range of multipliers to facilitate economic contribution analysis for this study. By allocating the Australian intermediate inputs to their corresponding input-output industries and applying the appropriate multipliers for the Australian value added and employment data, it is possible to estimate the total Australian value added and employment contribution embodied in the Australian produced inputs and services demanded by port service providers at the Port of Melbourne. These service providers can source inputs from Australian domestic and international sources. All Australian inputs sourced contributions are included in the Australian contributions.

The Port service providers spent $2,053 million on intermediate goods and services in providing their services in 2021-22. It is estimated that $2,001 million was spent on domestically produced goods and services comprising various intermediate inputs. The domestic spend of $2,001 million associated with the Port indirectly generated additional production-induced revenue of $3,647

million and consumption-induced revenue of $3,436 million to the Australian economy. This is in addition to the direct income of $4,004 million associated with the Port.

It is estimated that the domestic spend of $2,001 million associated with the Port of Melbourne indirectly generated an additional production induced value-added of $1,847 million and other consumption induced value-added of $1,816 million to the Australian economy. This is in addition to the direct value-added of $1,951 million associated with the Port.

3.2.3 Total contribution

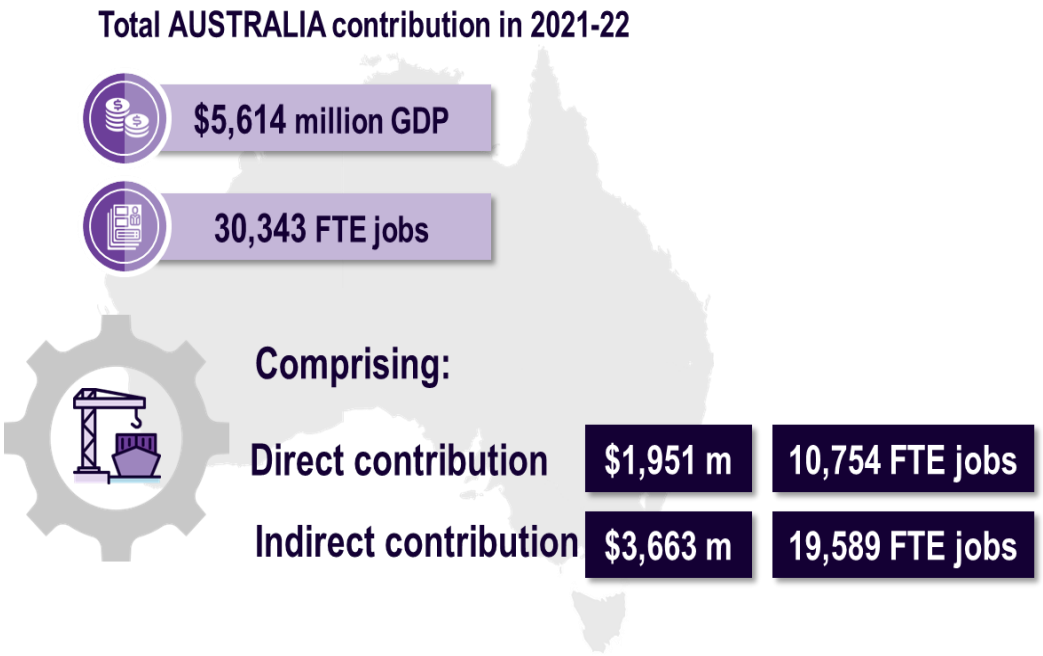
Figure 3.1 summarises the total economic contribution of the Port to the Australian economy in 2021-22.

Adding the direct and flow-on value-added economic contributions from Sections 3.2.1 and 3.2.2 provides the total contribution of the Port in 2021-22 to the Australian economy.

In 2021-22, the Port contributed the following:

- A total of $11,088 million in revenue to the Australian economy, comprising $4,004 million directly from the port-related activities (directly attributable income) and $7,084 million indirectly from its flow-on effects.
  - The estimated direct revenue of $4,004 million was 3.41 per cent of the value of the international trade through the Port.
  - In 2017-18, the Port contributed a direct revenue contribution of $2,932 million and a total revenue contribution of $7,491 million to the Australian economy.
  - This study estimates an increase of 48 per cent in revenue in current prices over the past four years.
- A total of $5,614 million to Australian GDP, comprising $1,951 million directly from the port-related activities (direct value-added) and $3,663 million indirectly from its flow-on effects.
  - The Port contributed a maximum of 0.243 per cent to Australian GDP in 2021-22.
  - In 2017-18, the Port contributed a direct value-added contribution of $1,510 million and a total of $3,886 million to the Australian economy.
  - This study estimates an increase of 44.5 per cent value-added over the past four years.
- Total employment of 30,343 FTE jobs throughout Australia, comprising 10,754 FTE jobs directly from the port-related activities and 19,589 FTE jobs indirectly from its flow-on effects.
  - This implies that, in 2021-22, for every 1 million dollars of revenue received by the port service providers due to the Port, there are up to 7.6 FTE jobs directly or indirectly supported throughout the Australian economy.
  - In 2017-18, the Port contributed a direct employment contribution of 9,214 FTE jobs and a total employment contribution of 29,773 FTE jobs to the Australian economy.
  - This study estimates an increase of 1.91 per cent in FTE jobs over the past four years.
  - In understanding the estimated number of jobs supported by the Port of Melbourne, it should be noted that they are presented as full-time-equivalent jobs for convenience. In reality, they represent the summation of many shares of individual jobs or include part-time and casual jobs. Consequently, the number of people whose employment is supported (partially or wholly) by the activities of the port will be greater than the estimated number of FTE jobs.

Figure 3.1 Estimated value-added and employment contribution of the Port of Melbourne to the Australian economy, 2021-22



Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources.

3.3 Victorian contribution

Table 3.2 provides the total Victorian direct and flow-on contributions in 2021-22.

Table 3.2 Economic contribution of the Port of Melbourne to Victoria, 2021-22

Indicator	Units	Direct	Flow-on		TOTAL
			Production induced	Consumption induced	
Output	A$m	3,770	3,493	3,311	**10,573**
Value-added/GSP	A$m	1,829	1,768	1,748	**5,345**
Per cent of GSP	*%*	0.355%	0.343%	0.339%	**1.04%**
Household income	A$m	741	940	806	**2,487**
Employment	FTE	**10,127**	**9,023**	**9,752**	**28,902**

Source: ACIL Allen estimates based on various sources.

3.3.1 Direct contribution

The estimated direct revenue associated with the Port of Melbourne in Victoria in 2021-22 was $3,770 million, 95 per cent of total Australian revenue attributable to the operations at the Port of Melbourne. The remaining 5 per cent is attributable to packing and unpacking in other jurisdictions in Australia.

The direct value-added embodied within this revenue is estimated to have been **$1,829 million**, mainly comprising pre-tax returns to industry owners and compensation of employees.

In 2021-22, Victorian GSP was $515,241 million, implying that the direct value-added contribution of the Port of Melbourne to the Victorian economy accounts for 0.355 per cent of Vitoria's 2021-22 GSP.

The direct income embodied within this revenue is estimated to have been **$741 million**.

The direct FTE related to the activities at the Port of Melbourne is estimated to have been **10,127 FTE** in Victoria.

3.3.2 Flow-on contribution

The direct contribution of an activity in terms of value-added is confined to the initial contributions of the activity. However, purchases of intermediate inputs or spending of incomes made because of an activity related to the Port of Melbourne lead to further contributions.

It is estimated that the Port of Melbourne service providers spent $1,940 million on intermediate goods and services in providing their services in 2021-22. Of this, it is estimated that $1,773 million was spent on Victorian goods and services comprising various intermediate inputs.

It is estimated that Victorian spending of $1,773 million associated with the Port of Melbourne indirectly generated an additional production-induced $3,493 million and consumption-induced $3,311 million revenue to the Victorian economy. This is in addition to the direct revenue associated with the Port of Melbourne in Victoria.

It is estimated that Victorian spending of $1,773 million associated with the Port of Melbourne by various businesses indirectly generated an additional production induced value-added of $1,768 million and consumption induced value-added of $1,748 million to the Victorian economy in 2021-22. This is in addition to the direct value-added associated with the Port of Melbourne in Victoria.

3.3.3 Total contribution

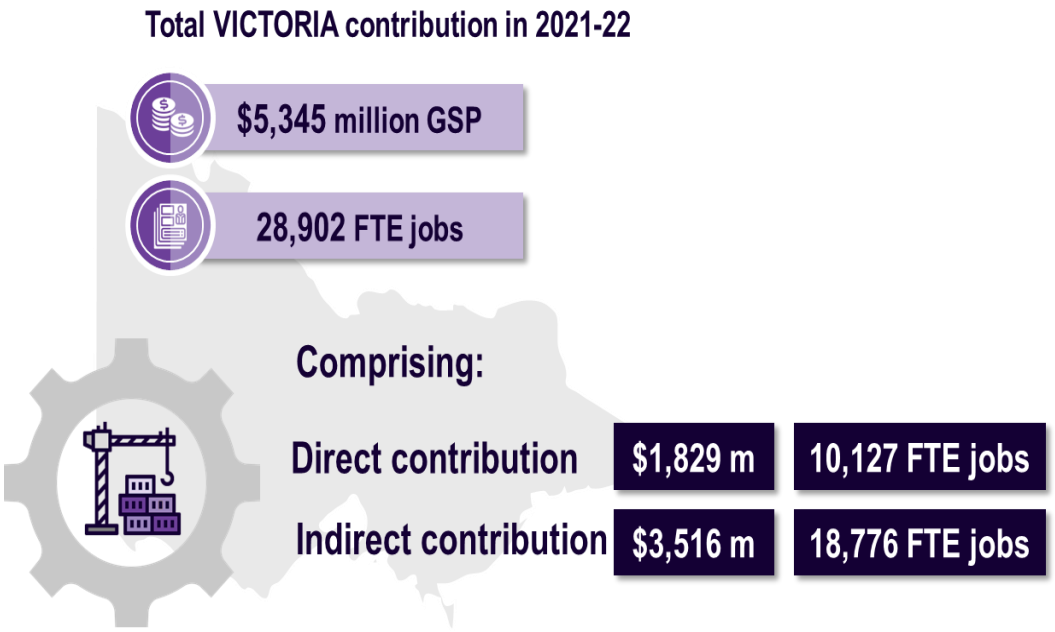
The total economic contribution of the Port of Melbourne to the Victorian economy in 2021-22 is summarised in **Figure 3.2**. Adding the direct and flow-on value-added economic contributions from Sections 3.3.1 and 3.3.2 provides the total economic footprint of the Port of Melbourne in 2021-22 to the Victorian economy.

In 2021-22, it is estimated that the Port of Melbourne had:

— a total contribution of $5,345 million to Victorian GSP, comprising $1,829 million directly from the Port related activities (direct value-added contribution) and $3,516 million indirectly from its input demand sources and additional consumption of employed persons in the Port related activities and its supply chain (flow-on) in Victoria. It contributed a maximum of 1.04 per cent to Victorian GSP in 2021-22.

— it supported a total employment of 28,902 FTE jobs throughout Victoria.

Figure 3.2 Estimated economic contribution of the Port of Melbourne to the Victorian economy, 2021-22



Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources.

Economic contribution by cargo type

4

4.1 Introduction

This chapter summarises economic contributions at Australian and state levels by cargo type. The estimates include output (gross revenue of total expenditure), value-added (payments to labour and capital), household wage income and employment. The following trade types are considered in this economic contribution assessment in this study:

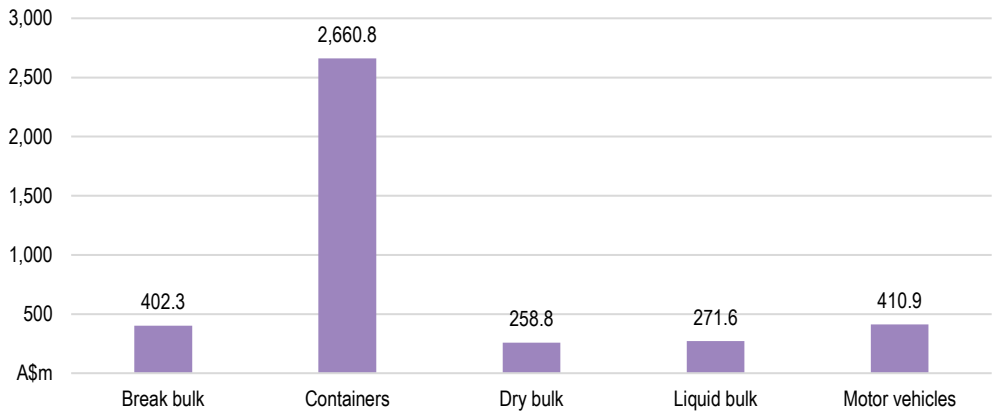
- containers
- liquid bulk
- dry bulk
- break bulk (excluding motor vehicles)
- motor vehicles.

4.2 Australian contribution by cargo type

4.2.1 Direct contribution

Figure 4.1 provides the total Australian direct revenue estimates by cargo type in 2021-22. The main cargo types at the Port of Melbourne are containers, motor vehicles, break bulk (non-containerised general cargo), liquid bulk, and dry bulk.

Figure 4.1 Direct revenue by cargo type in Australia, 2021-22



Source: ACIL Allen estimates based on various sources

The estimated direct revenue associated with the Port of Melbourne in Australia in 2021-22 was $4,004 million. Two-thirds of the income was related to the services provided in handling and

moving the containers from origin to destination. The container trade contributed directly $1,295 million value-added and nearly 7,000 direct FTE employment to the Australian economy.

Table 4.1 Direct contribution by cargo type in Australia, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Output	A$m	402	2,661	259	272	411	**4,004**
Value-added/GDP	A$m	196	1,295	126	133	201	**1,951**
Per cent of GDP	*%*	*0.008%*	*0.056%*	*0.005%*	*0.006%*	*0.009%*	***0.085%***
Household income	A$m	79	519	51	52	80	**780**
Employment	FTE	1,223	6,943	730	723	1,135	**10,754**

Source: ACIL Allen estimates based on various sources

4.2.2 Flow-on contribution

Table 4.2 provides Australia's total flow-on contributions by cargo type in 2021-22. Production-induced contributions provide a lower bound of the flow-on contribution estimates, while including the consumption-induced impacts provide an upper bound for the flow-on contributions on the Australian economy.

Table 4.2 Flow-on contribution by cargo type in Australia, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Production induced							
Output	A$m	367	2,426	236	247	373	**3,647**
Value-added/GDP	A$m	186	1,228	119	125	189	**1,847**
Household income	A$m	99	652	63	66	100	**980**
Employment	FTE	950	6,286	611	639	966	**9,453**
Consumption induced							
Output/GDP	A$m	346	2,285	223	231	351	**3,436**
Value-added	A$m	183	1,207	118	122	185	**1,816**
Household income	A$m	84	556	54	56	85	**836**
Employment	FTE	1,021	6,741	657	683	1,035	**10,136**

Source: ACIL Allen estimates based on various sources

4.2.3 Total contribution

Table 4.3 shows Australia's total contribution by cargo type in 2021-22.

Adding the direct and flow-on value-added economic contributions from Sections 4.2.1 and 4.2.2 provides the total economic footprint of the Port in 2021-22 by cargo type to the Australian economy.

In 2021-22, the Port contributed a *total* value-added contribution of $5,614 million to Australian GDP, comprising $3,731 million from the container trade, $575 million from motor vehicles, $564 million from break bulk trade, $4,380 million from liquid bulk trade and $363 million from dry bulk trade.

Table 4.3 Total contribution by cargo type in Australia, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Output	A$m	1,115	7,372	717	750	1,134	**11,088**
Value-added/GDP	A$m	564	3,731	363	380	575	**5,614**
Per cent of GDP	*%*	*0.024%*	*0.162%*	*0.016%*	*0.016%*	*0.025%*	***0.243%***
Household income	A$m	262	1,727	168	175	265	**2,596**
Employment	FTE	3,194	19,970	1,998	2,045	3,135	**30,343**

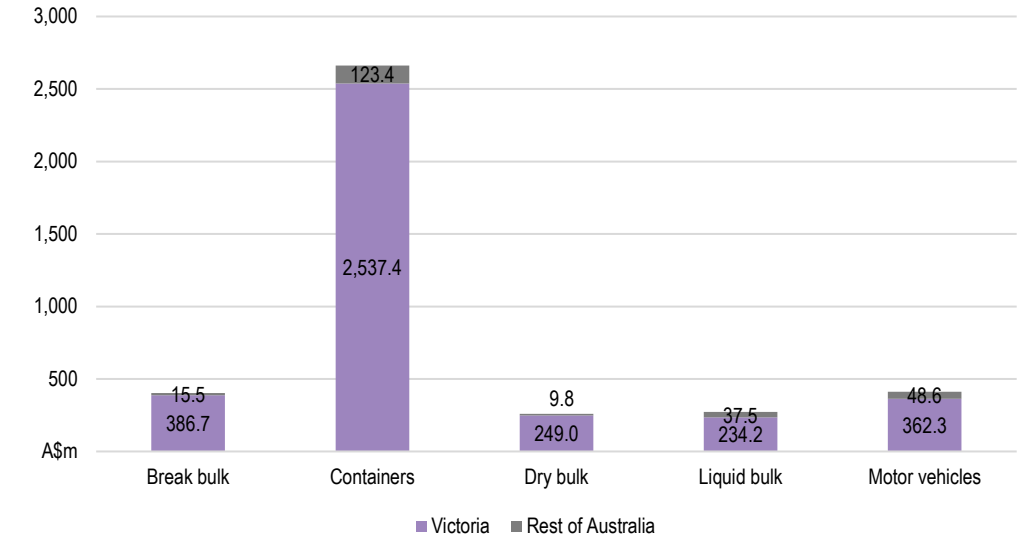
Source: ACIL Allen estimates based on various sources

4.3 Victorian contribution by cargo type

4.3.1 Direct contribution

Figure 4.2 provides direct revenue estimates by cargo type in Victoria in 2021-22.

Figure 4.2 Direct revenue by cargo type in Victoria, 2021-22



Source: ACIL Allen estimates based on various sources

The estimated direct revenue associated with the Port in Victoria in 2021-22 was $3,770 million.

Two-thirds of the revenue was related to the container trade shown in **Table 4.4**.

The container trade directly contributed 0.239 per cent of Victorian GSP in 2021-22.

Table 4.4 Direct contribution by cargo type in Victoria, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Output	A$m	387	2,537	249	234	362	**3,770**
Value-added/GSP	A$m	188	1,231	121	114	176	**1,829**
Per cent of GSP	*%*	*0.036%*	*0.239%*	*0.023%*	*0.022%*	*0.034%*	***0.355%***
Household income	A$m	76	499	49	46	71	**741**
Employment	FTE	1,178	6,621	702	624	1,001	**10,127**

Source: ACIL Allen estimates based on various sources

4.3.2 Flow-on contribution

Table 4.5 provides the flow-on contributions by cargo type to Victoria in 2021-22.

Table 4.5 Flow-on contribution by cargo type in Victoria, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Production induced							
Output	A$m	359	2,341	231	220	342	**3,493**
Value-added/GSP	A$m	181	1,185	117	111	173	**1,768**
Household income	A$m	96	630	62	59	92	**940**
Employment	FTE	925	6,055	595	566	882	**9,023**
Consumption induced							
Output	A$m	339	2,217	218	210	326	**3,311**
Value-added/GSP	A$m	179	1,170	115	111	172	**1,748**
Household income	A$m	83	539	53	51	79	**806**
Employment	FTE	999	6,534	643	617	960	**9,752**

Source: ACIL Allen estimates based on various sources

4.3.3 Total contribution

Adding the direct and flow-on value-added economic contributions from Sections 4.3.1 and 4.3.2 provides the total economic footprint of the Port in 2021-22 by cargo type to the Victorian economy.

Table 4.6 summarises the total (direct and flow-on-both production induced and consumption induced) contributions by cargo type to Victoria.

In 2021-22, the Port of Melbourne made a *total* contribution of $5,345 million to Victorian GSP, comprising $3,587 million from the container trade, $521 million from motor vehicles, $548 million from break bulk trade, $336 million from liquid bulk trade and $353 million from dry bulk trade.

Table 4.6 Total contribution by cargo type in Victoria, 2021-22

Indicator	Units	Break bulk	Containers	Dry bulk	Liquid bulk	Motor vehicles	Total
Output	A$m	1,085	7,095	698	665	1,030	**10,573**
Value-added/GSP	A$m	548	3,587	353	336	521	**5,345**
Per cent of GSP	*%*	*0.11%*	*0.70%*	*0.07%*	*0.07%*	*0.10%*	***1.04%***
Household income	A$m	255	1,668	164	157	243	**2,487**
Employment	FTE	3,102	19,210	1,940	1,807	2,843	**28,902**

Source: ACIL Allen estimates based on various sources

Economic contribution by port functions

5

5.1 Introduction

This chapter summarises economic contributions at Australian and state levels by port function. The estimates include output (gross revenue of total expenditure), value-added (payments to labour and capital), household wage income and employment.

Several port functions are included in this economic contribution assessment study. They are:

- Port administration
- Terminal and cargo stevedoring services
- Shipping services
- Shipping and cargo support services
- Port-related inland logistic operations
- Government agencies

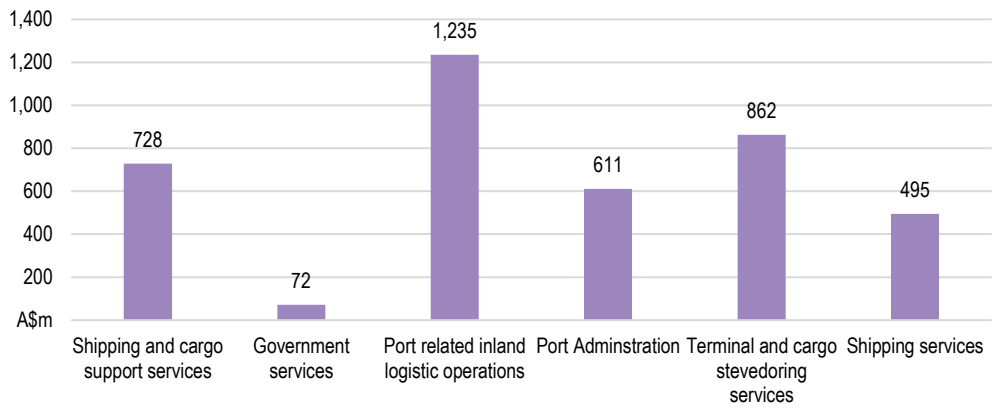
5.2 Australian contribution by port function

5.2.1 Direct contribution

Figure 5.1 provides Australian direct revenue estimates by port function in 2021-22.

The estimated direct revenue associated with the Port in Australia in 2021-22 was $4,004 million.

Figure 5.1 Direct revenue by port function in Australia, 2021-22



Source: ACIL Allen estimates based on various sources

Port-related inland logistic operations accounted for one-third of revenue, a total of $1,235 million. This revenue generated around $603 million value-added and supported nearly 3,826 direct FTE employment in the Australian economy.

The most prominent port function related to the Port is terminal and cargo stevedoring services, worth around $862 million or just over 20 per cent of revenue.

Table 5.1 Direct contribution by port function in Australia, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Output	A$m	728	72	1,235	611	862	495	**4,004**
Value-added/GDP	A$m	355	35	603	297	419	242	**1,951**
Per cent of GDP	*%*	*0.015%*	*0.002%*	*0.026%*	*0.013%*	*0.018%*	*0.010%*	***0.085%***
Household income	A$m	143	14	238	120	169	97	**780**
Employment	FTE	2,360	281	3,826	401	2,408	1,478	**10,754**

Source: ACIL Allen estimates based on various sources

5.2.2 Flow-on contribution

Table 5.2 summarises flow-on contributions by port function to Australia in 2021-22.

Table 5.2 Flow-on contribution by port function in Australia, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Production induced								
Output	A$m	664	65	1,123	559	787	449	**3,647**
Value-added/GDP	A$m	336	33	569	283	399	228	**1,847**
Household income	A$m	178	33	569	283	399	121	**1,583**
Employment	FTE	1,720	170	2,910	1,448	2,040	1,165	**9,453**
Consumption induced								
Output	A$m	626	62	1,054	527	743	424	**3,436**
Value-added/GDP	A$m	331	33	557	279	392	224	**1,816**
Household income	A$m	152	15	256	128	181	103	**836**
Employment	FTE	1,847	182	3,109	1,556	2,191	1,251	**10,136**

Source: ACIL Allen estimates based on various sources

5.2.3 Total contribution

Adding the direct and flow-on value-added economic contributions from Sections 5.2.1 and 5.2.2 provides the total economic footprint of the Port in 2021-22 by port function to the Australian economy. The total (direct and flow-on-both production induced and consumption-induced) contributions by port function to Australia are summarised in **Table 5.3**.

Table 5.3 Total contribution by port function in Australia, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Output	A$m	2,018	199	3,412	1,698	2,392	1,369	**11,088**
Value-added/GDP	A$m	1,022	101	1,728	858	1,210	694	**5,614**
Per cent of GDP	*%*	*0.044%*	*0.004%*	*0.075%*	*0.037%*	*0.052%*	*0.030%*	***0.243%***
Household income	A$m	473	62	1,063	532	749	320	**3,199**
Employment	FTE	5,927	633	9,845	3,405	6,639	3,894	**30,343**

Source: ACIL Allen estimates based on various sources

In 2021-22, the Port contributed a *total* value-added contribution of $5.614 million to Australian GDP, comprising:

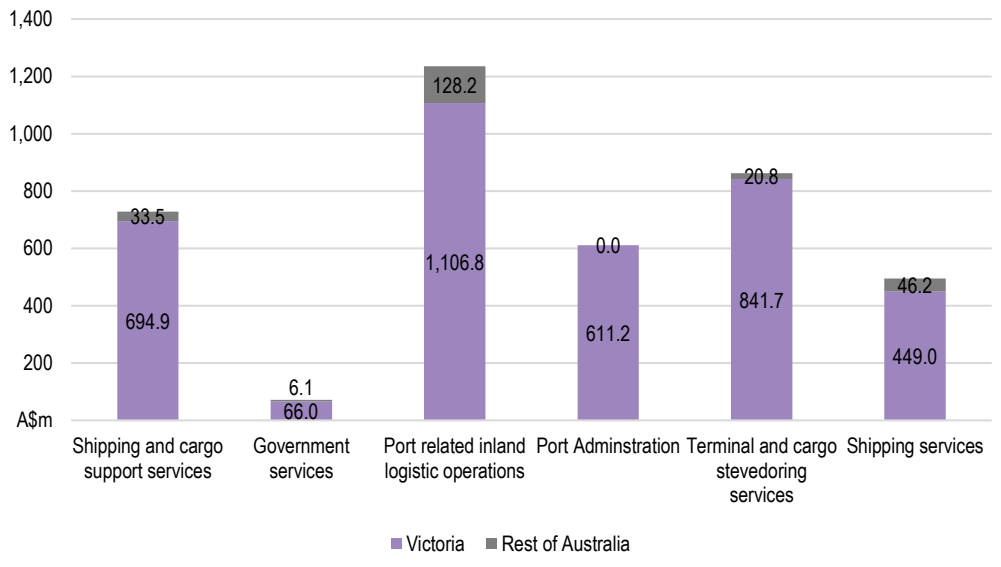
- $1,728 million from port-related inland logistic operations,
- $1,210 million from terminal and cargo stevedoring services,
- $1,022 million from shipping and cargo support services,
- $858 million from port administration activities, and
- $694 million from shipping operations.

5.3 Victorian contribution by port function

5.3.1 Direct contribution

Figure 5.2 summarises direct revenue estimates of port function in Victoria in 2021-22.

Figure 5.2 Direct revenue by port function in Victoria, 2021-22



Source: ACIL Allen estimates based on various sources

The estimated direct revenue associated with the Port of Melbourne in Victoria in 2021-22 was $3,770 million. One-third of revenue was related to port-related inland logistic functions, as shown in **Table 5.4**. The port-related inland logistic function directly contributed 0.104 per cent of Victorian GSP in 2021-22.

Table 5.4 Direct contribution by port function in Victoria, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Output	A$m	695	66	1,107	611	842	449	**3,770**
Value-added/GSP	A$m	337	32	537	297	408	218	**1,829**
Per cent of GSP	*%*	*0.065%*	*0.006%*	*0.104%*	*0.058%*	*0.079%*	*0.042%*	***0.355%***
Household income	A$m	137	13	218	120	165	88	**741**
Employment	FTE	2,261	259	3,499	401	2,355	1,351	**10,127**

Source: ACIL Allen estimates based on various sources

5.3.2 Flow-on contribution

Production-induced and consumption-induced flow-on contributions by port function in Australia are summarised in **Table 5.5**.

Table 5.5 Flow-on contribution by port function in Victoria, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Production induced								
Output	A$m	646	62	1,024	559	776	425	**3,493**
Value-added/GSP	A$m	327	32	518	283	393	215	**1,768**
Household income	A$m	174	32	518	283	393	115	**1,514**
Employment	FTE	1,665	160	2,655	1,448	2,006	1,089	**9,023**
Consumption induced								
Output	A$m	612	59	973	527	734	404	**3,311**
Value-added/GSP	A$m	323	31	513	279	388	213	**1,748**
Household income	A$m	149	14	237	128	179	98	**806**
Employment	FTE	1,800	174	2,875	1,556	2,162	1,185	**9,752**

Source: ACIL Allen estimates based on various sources

5.3.3 Total contribution

Adding the direct and flow-on value-added economic contributions from Sections 5.3.1 and 5.3.2 provides the total economic footprint of the Port in 2021-22 to the Victorian economy by port function.

The total (direct and flow-on-both production-induced and consumption-induced) contributions by port function in Victoria are summarised in **Table 5.6**.

Table 5.6 Total contribution by port function in Victoria, 2021-22

Indicator	Units	Shipping and cargo support services	Government services	Port-related inland logistic operations	Port Admin	Terminal and cargo stevedoring services	Shipping services	Total
Output	A$m	1,953	187	3,104	1,698	2,352	1,278	**10,573**
Value-added/GSP	A$m	988	95	1,568	858	1,189	646	**5,345**
Per cent of GSP	*%*	*0.192%*	*0.018%*	*0.304%*	*0.167%*	*0.231%*	*0.125%*	***1.037%***
Household income	A$m	459	59	972	532	737	301	**3,061**
Employment	FTE	5,727	593	9,029	3,405	6,524	3,625	**28,902**

Source: ACIL Allen estimates based on various sources

In 2021-22, the Port contributed a *total* value-added contribution of $5,345 million to Victorian GSP, comprising:

- $1,568 million from port-related inland logistic operations,
- $1,189 million from terminal and cargo stevedoring services,
- $988 million from shipping and cargo support services,
- $858 million from port administration activities, and
- $646 million from shipping operations.

Geographic distribution of contributions 6

6.1 Introduction

Exports originate from different regions in Victoria, southern New South Wales, western South Australia, Tasmania and other states in Australia. Similarly, imports from the Port go to various areas. Therefore, different geographic regions contribute differently to the total economic contribution of the Port.

6.2 LGA contributions

The total contribution (direct, production-induced, and consumption induced) of each economic indicator —output, value-added, income and employment — by LGA are summarised in **Table 6.1**.

Table 6.1 Total contribution by LGA/region, 2021-22

State	LGA code	LGA/region name	Output	Value-added	Income	Employment
			A$m	A$m	A$m	FTE
NSW	10050	Albury	30.3	16.3	6.7	78
NSW	10300	Balranald	0.1	0.1	0.0	0
NSW	10550	Bega Valley	1.5	0.8	0.3	4
NSW	10650	Berrigan	1.7	1.1	0.4	5
NSW	11600	Carrathool	0.3	0.2	0.1	1
NSW	12000	Coolamon	0.2	0.1	0.0	0
NSW	12160	Cootamundra-Gundagai Regional	0.0	0.0	0.0	0
NSW	12730	Edward River	0.4	0.2	0.1	1
NSW	12750	Eurobodalla	1.6	0.8	0.3	4
NSW	12870	Federation	0.6	0.4	0.1	2
NSW	13310	Goulburn Mulwaree	1.6	0.8	0.3	4
NSW	13340	Greater Hume Shire	0.0	0.0	0.0	0
NSW	13450/14750	Griffith/Leeton	35.0	19.8	7.8	97
NSW	13850	Hay	0.1	0.1	0.0	0
NSW	13910	Hilltops	0.9	0.5	0.2	2
NSW	14950	Lockhart	0.1	0.1	0.0	0
NSW	15520	Murray River	1.1	0.6	0.2	3
NSW	15560	Murrumbidgee	5.6	3.4	1.1	16

State	LGA code	LGA/region name	Output	Value-added	Income	Employment
NSW	15800	Narrandera	0.2	0.1	0.1	1
NSW	16490	Queanbeyan-Palerang Regional	0.0	0.0	0.0	0
NSW	16950	Shoalhaven	4.7	2.5	1.0	12
NSW	17040	Snowy Monaro Regional	0.0	0.0	0.0	0
NSW	17080	Snowy Valleys	0.7	0.4	0.1	2
NSW	17350	Temora	0.3	0.2	0.1	1
NSW	17640	Upper Lachlan Shire	0.0	0.0	0.0	0
NSW	17750	Wagga Wagga	5.1	2.4	1.0	11
NSW	18100	Weddin	0.1	0.1	0.0	0
NSW	18200	Wentworth	0.3	0.2	0.1	1
NSW	18710	Yass Valley	0.4	0.2	0.1	1
NSW	19399	Unincorporated NSW	0.0	0.0	0.0	0
NSW	na	Rest of NSW	47.8	22.2	9.4	101
Vic.	20110	Alpine	1.4	0.8	0.3	5
Vic.	20260	Ararat	6.6	3.7	1.6	23
Vic.	20570	Ballarat	23.1	11.3	5.3	66
Vic.	20660	Banyule	14.1	7.6	3.6	46
Vic.	20740	Bass Coast	4.1	2.2	1.0	13
Vic.	20830	Baw Baw	9.3	4.9	2.3	30
Vic.	20910	Bayside (Vic.)	13.9	7.4	3.5	43
Vic.	21010	Benalla	2.8	1.5	0.7	9
Vic.	21110	Boroondara	26.8	13.3	6.2	74
Vic.	21180	Brimbank	416.7	219.6	102.5	1,270
Vic.	21270	Buloke	7.4	4.3	1.8	26
Vic.	21370	Campaspe	12.5	6.5	3.0	39
Vic.	21450	Cardinia	16.5	9.0	4.1	55
Vic.	21610	Casey	42.5	23.7	10.9	140
Vic.	21670	Central Goldfields	2.0	1.1	0.5	7
Vic.	21750	Colac Otway	6.0	3.1	1.5	18
Vic.	21830	Corangamite	6.7	3.7	1.6	24
Vic.	21890	Darebin	29.9	15.0	7.2	88
Vic.	22110	East Gippsland	7.0	3.8	1.8	22
Vic.	22170	Frankston	23.2	11.8	5.6	70
Vic.	22250	Gannawarra	4.6	2.6	1.1	16
Vic.	22310	Glen Eira	11.0	5.9	2.8	34
Vic.	22410	Glenelg	4.9	2.8	1.3	17
Vic.	22490	Golden Plains	2.7	1.6	0.7	9
Vic.	22620	Greater Bendigo	28.6	14.1	6.5	81
Vic.	22670	Greater Dandenong	269.0	132.2	62.2	779

State	LGA code	LGA/region name	Output	Value-added	Income	Employment
Vic.	22750	Greater Geelong	169.9	81.0	38.5	477
Vic.	22830	Greater Shepparton	16.5	8.4	3.9	50
Vic.	22910	Hepburn	1.7	0.9	0.4	6
Vic.	22980	Hindmarsh	2.2	1.3	0.6	8
Vic.	23110	Hobsons Bay	1,200.1	658.9	305.3	3,428
Vic.	23190	Horsham	13.6	6.8	3.2	40
Vic.	23270	Hume	141.6	77.0	35.3	451
Vic.	23350	Indigo	1.4	0.8	0.4	5
Vic.	23430	Kingston (Vic.)	100.3	49.1	23.2	285
Vic.	23670	Knox	75.2	37.5	17.1	215
Vic.	23810	Latrobe (Vic.)	23.4	12.0	5.6	72
Vic.	23940	Loddon	2.3	1.3	0.5	8
Vic.	24130	Macedon Ranges	5.8	3.1	1.4	19
Vic.	24210	Manningham	13.2	7.1	3.3	43
Vic.	24250	Mansfield	1.7	0.9	0.4	6
Vic.	24330	Maribyrnong	873.3	454.6	215.4	2,566
Vic.	24410	Maroondah	33.2	16.9	8.1	98
Vic.	24600	Melbourne	4,489.1	2199.7	1019.8	11,245
Vic.	24650	Melton	111.2	66.7	29.9	386
Vic.	24780	Mildura	19.3	9.9	4.7	59
Vic.	24850	Mitchell	3.9	2.2	1.0	13
Vic.	24900	Moira	7.9	4.4	2.0	26
Vic.	24970	Monash	92.9	42.3	20.1	239
Vic.	25060	Moonee Valley	15.7	8.2	3.9	48
Vic.	25150	Moorabool	3.2	1.8	0.8	11
Vic.	25250	Moreland	21.4	11.5	5.5	68
Vic.	25340	Mornington Peninsula	20.1	10.7	5.0	64
Vic.	25430	Mount Alexander	3.6	2.0	0.9	12
Vic.	25490	Moyne	22.2	12.5	5.4	79
Vic.	25620	Murrindindi	2.1	1.2	0.5	7
Vic.	25710	Nillumbik	4.5	2.6	1.2	15
Vic.	25810	Northern Grampians	3.8	2.1	0.9	13
Vic.	25900	Port Phillip	1,713.3	838.1	391.0	4,676
Vic.	25990	Pyrenees	1.6	0.9	0.4	6
Vic.	26080	Queenscliffe	0.3	0.2	0.1	1
Vic.	26170	South Gippsland	7.3	3.9	1.8	24
Vic.	26260	Southern Grampians	6.1	3.3	1.5	20
Vic.	26350	Stonnington	12.0	6.0	2.9	34
Vic.	26430	Strathbogie	1.5	0.9	0.4	5
Vic.	26490	Surf Coast	3.7	2.0	0.9	12

State	LGA code	LGA/region name	Output	Value-added	Income	Employment
Vic.	26610	Swan Hill	7.1	3.7	1.7	22
Vic.	26670	Towong	1.3	0.7	0.3	5
Vic.	26700	Wangaratta	5.6	2.9	1.4	17
Vic.	26730	Warrnambool	5.4	2.7	1.3	15
Vic.	26810	Wellington	8.2	4.5	2.1	27
Vic.	26890	West Wimmera	2.4	1.3	0.6	9
Vic.	26980	Whitehorse	27.1	13.2	6.3	76
Vic.	27070	Whittlesea	48.2	25.7	11.8	149
Vic.	27170	Wodonga	8.9	4.7	2.2	27
Vic.	27260	Wyndham	169.1	94.7	43.5	552
Vic.	27350	Yarra	34.2	15.9	7.7	91
Vic.	27450	Yarra Ranges	16.5	8.7	4.1	53
Vic.	27630	Yarriambiack	3.7	2.2	0.9	13
Vic.	29399	Unincorporated Vic	0.3	0.1	0.1	1
QLD	na	Queensland	6.6	3.4	1.4	18
SA	40070	Adelaide	2.1	1.0	0.4	5
SA	40120	Adelaide Hills	7.5	4.0	1.6	23
SA	40150	Adelaide Plains	0.1	0.1	0.0	0
SA	40220	Alexandrina	0.3	0.2	0.1	1
SA	40310	Barossa	0.6	0.3	0.1	2
SA	40430	Barunga West	0.0	0.0	0.0	0
SA	40520	Berri Barmera	0.7	0.3	0.1	2
SA	40700	Burnside	3.9	2.0	0.8	10
SA	41060	Charles Sturt	5.4	2.6	1.1	14
SA	41140	Clare and Gilbert Valleys	0.2	0.1	0.0	0
SA	47800	Coorong	0.1	0.1	0.0	0
SA	41560	Copper Coast	0.2	0.1	0.0	0
SA	42030	Gawler	0.2	0.1	0.0	1
SA	42110	Goyder	0.1	0.0	0.0	0
SA	42250	Grant	0.2	0.1	0.0	1
SA	42600	Holdfast Bay	0.3	0.2	0.1	1
SA	42750	Kangaroo Island	0.1	0.1	0.0	0
SA	43080	Karoonda East Murray	0.0	0.0	0.0	0
SA	43360	Kingston (SA)	2.9	1.6	0.6	9
SA	43650	Light	0.2	0.1	0.1	1
SA	43790	Loxton Waikerie	1.2	0.6	0.3	4
SA	44060	Marion	3.1	1.6	0.7	9
SA	44210	Mid Murray	0.1	0.1	0.0	0
SA	44340	Mitcham	0.6	0.3	0.1	2
SA	44550	Mount Barker	0.5	0.3	0.1	2

State	LGA code	LGA/region name	Output	Value-added	Income	Employment
SA	44620	Mount Gambier	0.8	0.4	0.2	2
SA	44830	Mount Remarkable	0.0	0.0	0.0	0
SA	45090	Naracoorte Lucindale	0.2	0.1	0.0	0
SA	45120	Northern Areas	0.1	0.0	0.0	0
SA	45340	Onkaparinga	8.2	4.3	1.8	24
SA	45400	Orroroo Carrieton	0.0	0.0	0.0	0
SA	45540	Peterborough	0.0	0.0	0.0	0
SA	45680	Playford	1.3	0.7	0.3	4
SA	45890	Port Adelaide Enfield	15.8	8.0	3.4	44
SA	46450	Port Pirie	0.4	0.2	0.1	1
SA	46860	Robe	0.0	0.0	0.0	0
SA	47140	Salisbury	9.8	5.3	2.2	29
SA	47290	Southern Mallee	0.1	0.0	0.0	0
SA	47630	Tatiara	0.2	0.1	0.0	0
SA	47700	Tea Tree Gully	4.4	2.3	1.0	13
SA	49399	Unincorporated SA	1.5	0.9	0.3	5
SA	47980	Unley	0.7	0.3	0.1	2
SA	48050	Victor Harbor	0.2	0.1	0.0	0
SA	48130	Wakefield	0.1	0.1	0.0	0
SA	48340	Wattle Range	0.2	0.1	0.0	1
SA	48410	West Torrens	13.5	6.2	2.6	33
SA	48750	Yankalilla	0.1	0.0	0.0	0
SA	48830	Yorke Peninsula	0.2	0.1	0.0	1
SA	na	Rest of South Australia	6.0	2.9	1.2	16
WA	na	Western Australia	31.9	16.6	7.0	84
Tas	60210	Break O'Day	0.2	0.1	0.1	1
Tas	60410	Brighton	0.6	0.4	0.1	2
Tas	60610	Burnie	131.7	68.5	28.0	391
Tas	60810	Central Coast (Tas.)	6.7	3.8	1.5	22
Tas	61010	Central Highlands (Tas.)	0.1	0.1	0.0	0
Tas	61210	Circular Head	0.5	0.3	0.1	2
Tas	61410	Clarence	2.2	1.2	0.5	7
Tas	61510	Derwent Valley	0.4	0.2	0.1	1
Tas	61610	Devonport	63.5	33.5	13.5	194
Tas	61810	Dorset	0.3	0.1	0.1	1
Tas	62010	Flinders (Tas.)	0.1	0.0	0.0	0
Tas	62210	George Town	0.2	0.1	0.0	1
Tas	62410	Glamorgan-Spring Bay	0.2	0.1	0.0	1
Tas	62610	Glenorchy	2.4	1.3	0.5	7
Tas	62810	Hobart	3.8	1.9	0.8	11

State	LGA code	LGA/region name	Output	Value-added	Income	Employment
Tas	63010	Huon Valley	0.6	0.3	0.1	2
Tas	63210	Kentish	5.4	3.1	1.2	17
Tas	63410	King Island	0.1	0.1	0.0	0
Tas	63610	Kingborough	1.2	0.7	0.3	4
Tas	63810	Latrobe (Tas.)	4.7	2.7	1.0	15
Tas	64010	Launceston	4.8	2.3	1.0	13
Tas	64210	Meander Valley	0.6	0.3	0.1	2
Tas	64610	Northern Midlands	0.6	0.3	0.1	2
Tas	64810	Sorell	0.5	0.3	0.1	2
Tas	65010	Southern Midlands	0.1	0.1	0.0	0
Tas	65210	Tasman	0.1	0.0	0.0	0
Tas	65410	Waratah-Wynyard	0.6	0.3	0.1	2
Tas	65610	West Coast	0.2	0.1	0.0	1
Tas	65810	West Tamar	0.6	0.3	0.1	2
NT	na	Northern Territory	0.2	0.1	0.0	0
ACT	na	Australian Capital Territory	8.1	4.7	1.9	23
TOTAL CONTRIBUTION			**11,088**	**5,614**	**2,596**	**30,343**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources

The most significant contributions to LGAs/regions are summarised in **Table 6.2**.

Table 6.2 Top LGA/region contributions, 2021-22

LGA name	Output	Value-added	Income	Employment	Per cent of value-added
Melbourne	4,489	2,200	1,020	11,245	39.2%
Port Phillip	1,713	838	391	4,676	14.9%
Hobsons Bay	1,200	659	305	3,428	11.7%
Maribyrnong	873	455	215	2,566	8.1%
Brimbank	417	220	102	1,270	3.9%
Greater Dandenong	269	132	62	779	2.4%
Greater Geelong	170	81	39	477	1.4%
Wyndham	169	95	43	552	1.7%
Hume	142	77	35	451	1.4%
Burnie	132	68	28	391	1.2%
Melton	111	67	30	386	1.2%
Kingston (Vic.)	100	49	23	285	0.9%
Monash	93	42	20	239	0.8%
Knox	75	38	17	215	0.7%
Devonport	64	33	13	194	0.6%
All other	1,071	560	251	3,187	10.0%

LGA name	Output	Value-added	Income	Employment	Per cent of value-added
TOTAL	**11,088**	**5,614**	**2,596**	**30,343**	**100.0%**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimates based on various sources

Flow-on effects by industry 7

7.1 Industry impacts

The flow-on effects are those in addition to the direct impacts. They reflect the production and consumption-induced impacts of businesses and persons receiving income from servicing the Port with related economic activities. The flow-on effects by input-output industry group are estimated and mapped to ANZSIC division industries and provided in **Table 7.1**.

Table 7.1 Total flow-on effects by industry, 2021-22

ANZSIC division	Output	Value-added	Income	Employment
	A$m	A$m	A$m	FTE
Transport, postal and warehousing	1,037.3	488.3	210.8	2,609
Rental hiring and real estate services	866.8	473.1	63.2	532
Financial and insurance services	845.1	509.9	171.6	1,446
Professional, scientific and technical services	746.2	410.5	281.0	2,735
Administrative and support services	482.7	320.6	261.1	1,517
Manufacturing	462.4	155.1	87.4	1,084
Construction	425.0	137.0	67.8	998
Retail trade	312.2	187.7	111.2	1,957
Information media and telecommunications	291.6	127.8	44.5	419
Electricity, gas, water and waste services	290.8	85.2	36.1	342
Wholesale trade	230.4	138.6	78.2	560
Other services	199.6	96.7	64.9	1,020
Accommodation and food services	190.3	107.8	67.5	1,278
Health care and social assistance	153.5	107.9	88.5	943
Education and training	140.6	97.3	82.4	857
Agriculture, forestry and fishing	127.6	60.6	11.8	346
Public administration and safety	124.6	71.4	62.7	599
Mining	93.9	59.6	11.1	94
Arts and recreation services	63.2	27.7	14.1	253
Total	**7,083.6**	**3,662.7**	**1,816.0**	**19,589**

Notes: Indirect economic activity due to interstate trade has been included in the regional contribution estimates based on their share of underlying activity. Totals may not add due to rounding.

Source: ACIL Allen estimated based on various sources.

In terms of industry sectors, the sector contributing the most considerable flow-on effects is "Transport, postal and warehousing". This sector provides essential services which support individuals, businesses and organisations carrying trade from the Port to the destinations. The flow-on effects from this sector were $1,037 million of total output, $488 million of total value-added, $211 million of household income, and employment of 2,609 FTEs.

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Appendices

Input-output multiplier analysis methodology

A

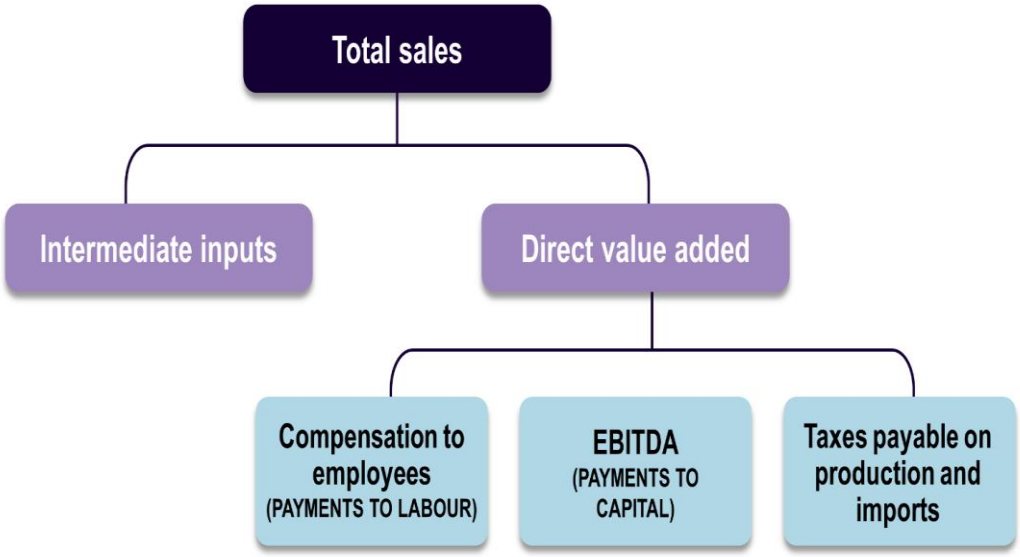
A.1 Direct economic contribution

The standard measure of economic contribution is the extent to which it increases the value of goods and services generated by the economy as a whole – in other words, the degree to which it increases economic activity as measured by GDP.

An economy has a range of factors of production (including labour and capital stock) and access to various intermediate inputs. By appropriately using the factors of production, industries add value to intermediate inputs by converting them into a range of goods and services more suited for consumers or other sectors.

The direct contribution of an industry to the Australian economy is estimated by determining their payments to the factors of production plus the taxes (fewer subsidies) payable on production and imports, as shown graphically in **Figure A.1**.

Figure A.1 Calculation of value-added



Note: EBITDA is equivalent to the SNA definition of gross operating surplus

Source: ACIL Allen based on Australian National Accounts.

Box A.1 summarises the ABS definitions as part of the System of National Accounts (SNA).

Box A.1 ABS definitions of value added

An industry's direct contribution to GDP or GSP is well defined under the standard national accounting framework used by the ABS, known as the System of National Accounts (SNA). SNA recognises three different measures of value added:

- a) Value added at Purchasers' Prices. This is defined as output valued at purchasers' prices, less intermediate consumption valued at producer prices. This measure is equivalent to the traditional estimate of value added at market prices.
- b) Value added at Basic Prices. In this measure, the output is valued at basic prices, while intermediate consumption is valued at producer prices. In the case of beer production, this measure excludes beer excise, which is viewed as a production tax levied on output.
- c) Value added at factor Cost. This measure excludes all production taxes net of subsidies. In other words, it excludes all production taxes – such as payroll taxes, fringe benefit taxes etc – and not just those that are levied on output.

The measure of value added to be used depends on the nature of the analysis that is to be conducted. When presenting an industry view of GDP for example, the ABS uses value added at basic prices and adds an aggregate estimate of net taxes on products in question to give an objective measure of GDP at purchasers' prices (ABS Catalogue No. 5216).

Source: ABS

A.2 Indirect economic contribution

Indirect effects are a broader notion of the economic contribution that includes supply-side effects of employees' expenditure beyond the direct export production component. To fully measure the indirect effects, an account should also be taken of changes in incomes, which may further increase domestic demand.

The intermediate inputs used by industry can be sourced either from within the Australian economy or from foreign economies. If purchased from within the Australian economy, then the portion of value-added embodied in the intermediate input is indirectly associated with the purchaser's activity. The indirect contribution calculation quickly becomes complicated as one considers the value-added embodied in the intermediate inputs of the intermediate input.

IO and the associated 'IO multipliers' can be used to estimate indirect economic contributions. IO multipliers are summary measures generated from IO tables that can be used for predicting the total contribution of all industries in the economy of changes in demand for the output of any one sector. The tables and multipliers can also be used to measure the relative importance of the production chain linkages to different parts of the economy.

It should be noted that some of the assumptions underpinning IO multipliers can impede credible analysis. Understanding these assumptions is necessary to prevent the inappropriate application of IO multipliers — for example, in situations where economic constraints are present or when the profile of a business or project differs substantially from the industry average. We do not consider that these conditions apply to this analysis and that using IO multipliers to estimate the economic footprint of the chemical industry is appropriate. Further information on IO tables and the calculation of multipliers can be found in ABS Catalogue number 5246.0.

A.3 Overview of IO tables

IO tables provide a snapshot of an economy at a particular time. The tables used in this analysis were for the 2019-20 financial year.

IO multipliers are derived from IO tables. These multipliers show how changes to a given part of an economy contribute to the economy.

The IO multipliers allow an analysis of the economic footprint of the export industry in Victoria. Although IO multipliers may also be suitable tools for analysing the contribution of various types of economic change, caution needs to be adopted in their application for this purpose. Misuse of IO multipliers for contribution analysis has led to scepticism of their general use in favour of other tools such as CGE modelling. Notwithstanding this, they are still eminently suitable for understanding the economic linkages between a given activity or industry to gain an appreciation of the broader interactions of the industry beyond its direct contribution.

A.3.1 Multiplier types

IO multipliers estimate the economic contribution of a region's economy from a one-dollar change in the final demand for one of the region's industries' output. Generally, four types of multipliers are used:

— Output – measures the contribution on the production of all sectors in the economy

— Income – measures the effect on the wages and salaries paid to workers within the economy

— Employment – measures the jobs creation contribution, and

— Value-added – measures the contribution on wages and salaries, profits and indirect taxes.

The sum of wages and salaries, profits and indirect taxes for a given industry provides a measure of its contribution to the size of the local economy – its contribution to gross regional product (GRP). The value-added multiplier can, therefore, also be considered to be the GRP multiplier.

IO multipliers are a flexible tool for economic analysis. Their flexibility stems from the different forms of each multiplier type. For Victoria, multipliers were estimated in the following forms:

— initial effects

— first-round effects

— industrial support effects

— production induced effects

— consumption induced effects

— simple multipliers

— total multipliers

— type 1A multipliers

— type 1B multipliers

— type 2A multipliers

— type 2B multipliers.

Further information on IO tables and the calculation of multipliers can be found in ABS Catalogue number 5246.0. However, a brief overview of the different types of output multipliers is presented below.

A.3.2 Multiplier effects

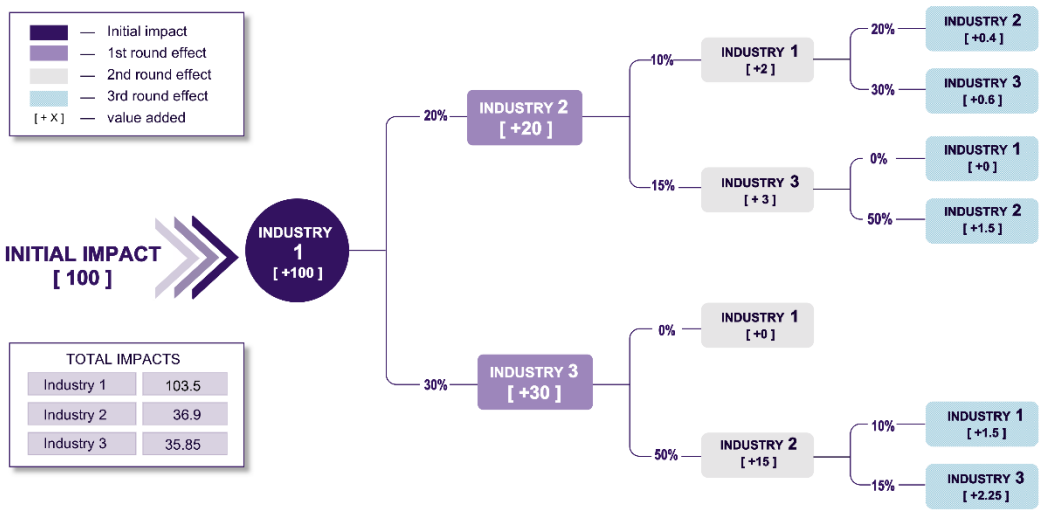
When additional sales to final demand are made, for example, through increased exports, production increases to meet the increased demand, and this is the initial effect. Since production increases to exactly match the increased final export demand, the increase is always equal to one (noting that the multipliers are defined in terms of a one dollar increase in final demand). The industry producing the additional output makes purchases to enable itself to increase production, these new purchases are met by production increases in other industries, and these constitute the *first-round effect*. These first-round production increases cause other industries also to increase their purchases, and these purchases cause other industries to increase their production, and so

on. These 'flow-on' effects eventually diminish, but when 'added together constitute the industrial support effect.

The industrial support effect added to the first-round effect is known as the production induced effect. So far, this chain of events has ignored one important factor, the effect on labour and its consumption. When output increases, employment increases, and increased employment translates to increased earnings and consumption by workers, which translates to increased output to meet the increased consumption. This is the consumption effect.

An illustration of direct and indirect contributions is shown in **Figure A.2**.

Figure A.2 An illustration of direct and indirect contributions



Source: ACIL Allen

A.3.3 Multipliers

The simple and total multipliers are derived by summing the effects. The simple multiplier is the sum of the initial and production induced effects. The total multiplier is larger because it also adds in the consumption effect. So far, all the effects and multipliers listed have had one thing in common: they all measure the contribution on the economy of the initial increase in final demand.

The remaining multipliers take a different point of view. They are ratios of the above multiplier types to the initial effect. The type 1A multiplier is calculated as the ratio of the initial and first-round effects to the initial effect, while the type 1B multiplier is the ratio of the simple multiplier to the initial effect. The type 2A multiplier is the ratio of the total multiplier to the initial effect, while the type 2B multiplier is the ratio of the total multiplier less the initial effect to the initial effect. Given the large number of multiplier types to choose from, output, income, employment and value-added multipliers, each with numerous variations (simple, total, type 2A, et cetera) it is important that the analysis uses the most appropriate multipliers. Usually, the multipliers that include consumption effects (i.e. the added contribution that comes from wage and salaries earners spending their income) are used. These are the total and type 2A multipliers. The total and type 2A multipliers will generally provide the biggest projected contribution. Simple or type 1B (which omit the consumption effect) may be used to provide a more conservative result.

For this analysis, the Simple multipliers were used to calculate the lower estimates of the contribution of the international export sector to the Victorian economy.

A.4 Limitations of input-output analysis

Although IO analysis is valid for understanding the contribution a sector makes to the economy, when used for analysing the potential contributions of a change in the production of a particular sector, IO analysis is not without its limitations. IO analysis builds on a snapshot of an economy in a given period. The multipliers derived from these tables are therefore based on the structure of the economy at that time, a structure that it is assumed remains fixed over time. When multipliers are applied, the following is assumed:

- prices remain constant;
- technology is fixed in all industries;
- import shares are fixed.

Therefore, the changes predicted by input-output multipliers proceed along a path consistent with the structure of the economy described by the input-output table. This precludes economies of scale. That is, no efficiency is gained by industries getting larger – rather they continue to consume resources (including labour and capital) at the rate described by the input-output table. Thus, if output doubles, the use of all inputs doubles as well.

One other assumption underpinning input-output analysis which is worth considering is that there are assumed to be unlimited supplies of all resources, including labour and capital. With input-output analysis, resource constraints are not a factor. Thus, it is assumed that no matter how large a development, all required resources are available, and there is no competition between industries for these resources.

It is important to understand the limitations of input-output analysis and to remember that the analysis provides an estimate of the contribution of international exports to the Victorian economy.

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