ECONOMIC SURVEY OF SINGAPORE

Third Quarter 2022

November 2022

Ministry of Trade and Industry
Republic of Singapore

website: **www.mti.gov.sg**
email: **mti_email@mti.gov.sg**

CONTENTS

MAIN INDICATORS OF
THE SINGAPORE ECONOMY

OVERALL ECONOMY

Real Gross Domestic Product
(Year-on-Year-Growth)

2Q22	3Q22
+4.5%	+4.1%

Gross Domestic Product
at Current Market Prices

2Q22	3Q22
$147.2 billion	$148.0 billion

PRICES

Consumer Price Index — All Items
(Year-on-Year Growth)

2Q22	3Q22
+5.9%	+7.3%

Domestic Supply Price Index
(Year-on-Year Growth)

2Q22	3Q22
+29.8%	+16.4%

LABOUR MARKET

Change in Employment
(Quarter-on-Quarter)

2Q22	3Q22
+71.1 thousand	+83.1 thousand

Overall Unemployment Rate

2Q22	3Q22
2.1%	2.0%

Value-Added per Actual Hour Worked
(Year-on-Year Growth)

2Q22	3Q22
+1.0%	-1.7%

COSTS

Unit Labour Cost of Overall Economy
(Year-on-Year Growth)

2Q22	3Q22
+8.6%	+7.5%

Unit Business Cost of Manufacturing
(Year-on-Year Growth)

2Q22	3Q22
+6.5%	+8.6%

Unit Labour Cost of Manufacturing
(Year-on-Year Growth)

2Q22	3Q22
+9.0%	+10.8%

MERCHANDISE TRADE

Merchandise Exports

2Q22	3Q22
$184,288 million	$190,063 million
+24.9% Year-on-Year Growth	+23.5% Year-on-Year Growth

Merchandise Imports

2Q22	3Q22
$173,418 million	$175,361 million
+31.6% Year-on-Year Growth	+28.2% Year-on-Year Growth

SERVICES TRADE

Services Exports

2Q22	3Q22
$86,158 million	$89,618 million
+13.8% Year-on-Year Growth	+15.8% Year-on-Year Growth

Services Imports

2Q22	3Q22
$81,867 million	$83,735 million
+12.4% Year-on-Year Growth	+12.4% Year-on-Year Growth

THE SINGAPORE ECONOMY

Chapter 1

THE SINGAPORE ECONOMY

ECONOMIC PERFORMANCE

Real GDP grew by
4.1% in 3Q22

Main Drivers of Growth in 3Q22

Wholesale Trade

0.9%-point contribution

Other Services Industries

0.8%-point contribution

Quarterly Growth (Year-on-Year)

LABOUR MARKET

Resident Unemployment Rate

2.9% in 3Q22

Employment (Q-O-Q Change)

+83,100 employed

Sectors with the Highest Employment Growth in 3Q22

+30,500 employed
Construction

+12,400 employed
Other Services Industries

+12,100 employed
Manufacturing

PRODUCTIVITY

Value-Added per Actual Hour Worked decreased by
1.7% in 3Q22

Sectors with the Highest Growth in Value-Added per Actual Hour Worked in 3Q22

19.0%
Food & Beverage Services

13.6%
Real Estate

9.1%
Administrative & Support Services

COSTS

Overall Unit Labour Cost increased by

7.5% in 3Q22

Within the Manufacturing Sector

8.6%

Unit Business Cost

10.8%

Unit Labour Cost

PRICES

The Consumer Price Index (CPI) rose by

7.3% in 3Q22

Categories with Price Increases

19.4%

Transport

7.1%

Clothing & Footwear

6.5%

Food

INTERNATIONAL TRADE

Total Merchandise Exports increased by
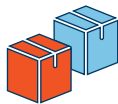
23.5% in 3Q22

75.2%

Oil Domestic Exports

19.8%

Re-Exports

7.2%

Non-Oil Domestic Exports

Total Services Exports grew by

15.8% in 3Q22

Services Exports Increase was led by...

5.4%-pt

Transport Services

5.1%-pt

Travel

2.7%-pt

Other Business Services

OVERVIEW

In the third quarter of 2022,

▸ The Singapore economy expanded by 4.1 per cent on a year-on-year basis. The sectors that contributed the most to GDP growth during the quarter were wholesale trade, other services and professional services.

▸ The seasonally-adjusted unemployment rates fell at the overall level, but rose slightly for residents and citizens. The number of retrenchments also increased over the quarter.

▸ Total employment rose by 83,100 on a quarter-on-quarter basis, extending the gains in the preceding quarter. Excluding Migrant Domestic Workers (MDWs), total employment increased by 75,600 on the back of employment gains for both residents and non-residents. Non-residents accounted for the bulk of total employment growth following the significant relaxation of border restrictions in April 2022.

▸ The Consumer Price Index-All Items (CPI-All Items) rose by 7.3 per cent on a year-on-year basis, faster than the 5.9 per cent increase registered in the second quarter.

OVERALL PERFORMANCE

The Singapore economy expanded by 4.1 per cent on a year-on-year basis in the third quarter of 2022, easing from the 4.5 per cent growth in the previous quarter (Exhibit 1.1). On a quarter-on-quarter seasonally-adjusted basis, the economy grew by 1.1 per cent, a reversal from the 0.1 per cent contraction in the preceding quarter.

Exhibit 1.1: GDP and Sectoral Growth Rates in 3Q 2022
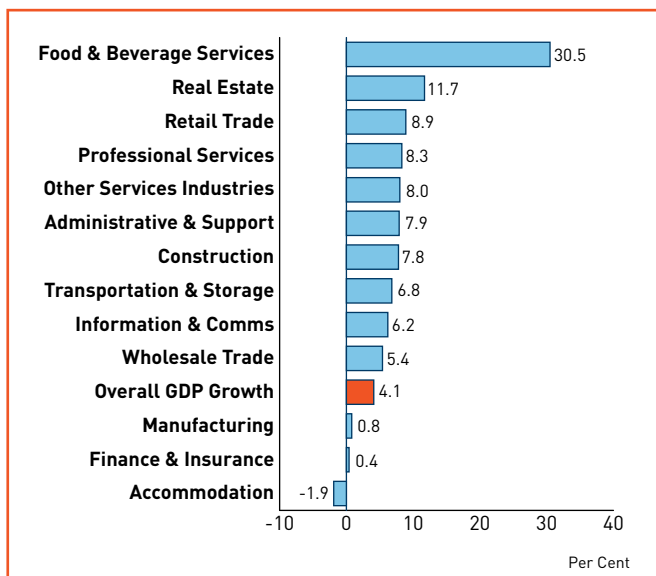
The manufacturing sector grew by 0.8 per cent year-on-year, moderating from the 5.6 per cent growth recorded in the previous quarter. Growth during the quarter was supported by output expansions in the transport engineering, general manufacturing and precision engineering clusters, which outweighed output declines in the chemicals, biomedical manufacturing and electronics clusters.

The services producing industries expanded by 5.8 per cent year-on-year, extending the 5.0 per cent growth registered in the previous quarter. Growth was supported by expansions in all services sectors except for the accommodation sector, which contracted by 1.9 per cent. Among the services sectors that expanded, the food & beverage services (30.5 per cent), real estate (11.7 per cent) and retail trade (8.9 per cent) sectors saw the fastest expansions.

The construction sector grew by 7.8 per cent year-on-year, accelerating from the 4.8 per cent growth in the previous quarter. The sector's growth came on the back of an expansion in both public and private sector construction output.

The top three positive contributors to GDP growth in the third quarter were the wholesale trade, other services and professional services sectors (Exhibit 1.2).

Exhibit 1.2: Percentage-Point Contribution to Growth in Real GDP in 3Q 2022 (By Industry)

Industry	Per Cent
Overall GDP Growth	4.1
Wholesale Trade	0.9
Other Services Industries	0.8
Professional Services	0.5
Transportation & Storage	0.4
Information & Comms	0.3
Real Estate	0.3
Administrative & Support	0.3
Food & Beverage Services	0.2
Construction	0.2
Manufacturing	0.2
Retail Trade	0.1
Finance & Insurance	0.1
Accommodation	0.0

Exhibit 1.3: Changes in Total Demand*

	2021		2022		
	II	IV	I	II	III
Total Demand	8.2	7.0	3.5	5.5	**7.3**
External Demand	6.9	7.9	4.1	4.9	**9.1**
Total Domestic Demand	11.8	4.6	2.2	7.2	**2.3**
Consumption Expenditure	3.9	2.8	2.2	9.9	**7.3**
Public	3.3	3.6	-3.9	-1.7	**-3.8**
Private	4.1	2.6	4.9	13.8	**11.4**
Gross Fixed Capital Formation	32.8	8.3	2.5	3.2	**3.5**
Changes in Inventories	-0.3	0.0	0.0	-0.1	**-2.3**

* For inventories, this refers to the contribution to GDP growth.

SOURCES OF GROWTH

Total demand increased by 7.3 per cent year-on-year in the third quarter of 2022, an improvement from the 5.5 per cent growth in the previous quarter (Exhibit 1.3). Both external and domestic demand expanded during the quarter. External demand climbed by 9.1 per cent year-on-year, faster than the 4.9 per cent increase in the previous quarter. Meanwhile, domestic demand expanded by 2.3 per cent year-on-year, slowing from the 7.2 per cent growth in the second quarter.

Within domestic demand, consumption expenditure rose by 7.3 per cent year-on-year, moderating from the 9.9 per cent increase in the preceding quarter. The increase in consumption expenditure was supported by higher private consumption expenditure (11.4 per cent), even as public consumption expenditure shrank (-3.8 per cent).

Meanwhile, gross fixed capital formation (GFCF) rose by 3.5 per cent year-on-year, extending the 3.2 per cent growth in the previous quarter. The increase in GFCF during the quarter was due to higher private sector GFCF (4.2 per cent), which outweighed a slight decline in public sector GFCF (-0.3 per cent). Private sector GFCF expanded on account of an increase in investments in private transport equipment, machinery & equipment and intellectual property products, which more than offset a fall in investments in private construction & works. Meanwhile, public sector GFCF declined due to lower investments in public machinery & equipment and transport equipment, even as investments in public construction & works and intellectual property products increased.

LABOUR MARKET

Unemployment and Retrenchment[1]

Compared to June 2022, the seasonally-adjusted unemployment rates in September 2022 dipped at the overall level (from 2.1 per cent to 2.0 per cent), but rose slightly for residents (from 2.8 per cent to 2.9 per cent) and citizens (3.0 per cent to 3.1 per cent) (Exhibit 1.4). As of September 2022, all three unemployment rates remained marginally below their respective pre-pandemic levels.[2]

Exhibit 1.4: Unemployment Rate (Seasonally-Adjusted)
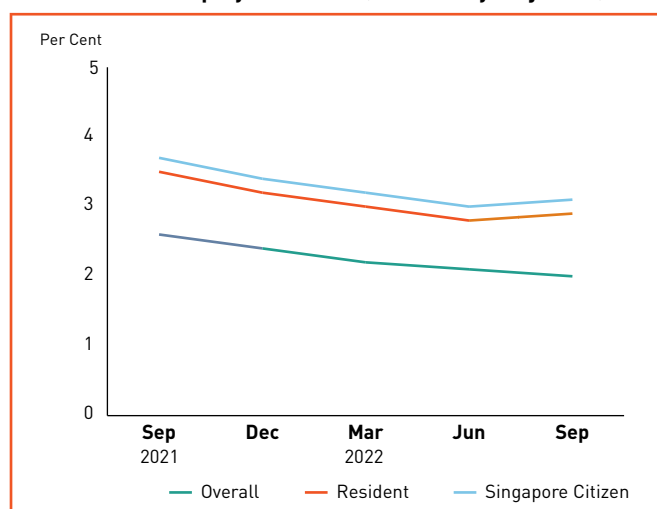

1   Retrenchment figures pertain to private sector establishments with at least 25 employees and the public sector.
2   The average pre-pandemic (i.e., 2018 and 2019) overall, resident and citizen unemployment rates were 2.2 per cent, 3.0 per cent and 3.2 per cent respectively.

In September 2022, an estimated 70,900 residents, including 62,400 Singapore citizens, were unemployed. These were slightly higher than the number of unemployed residents (69,300) and citizens (61,600) in June 2022.[3]

Total retrenchments rose to 1,600 in the third quarter of 2022, from a record low of 830[4] in the preceding quarter (Exhibit 1.5). Over the quarter, retrenchments increased in the services (from 610 to 1,100) and manufacturing (from 170 to 500) sectors, but fell in the construction sector (from 50 to 0).
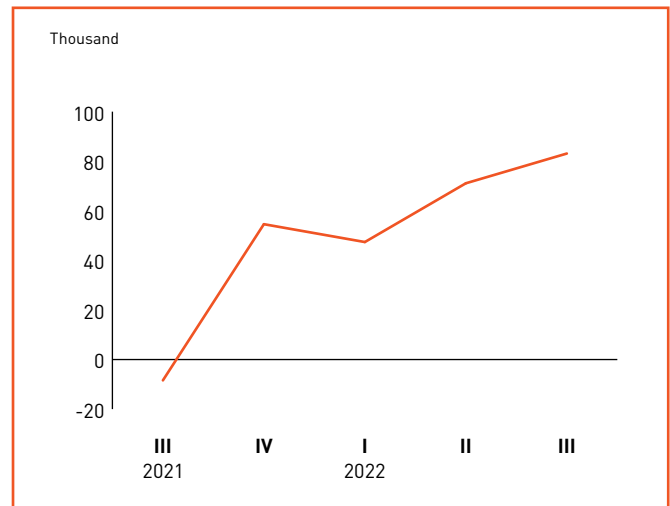
**Exhibit 1.5: Retrenchments**
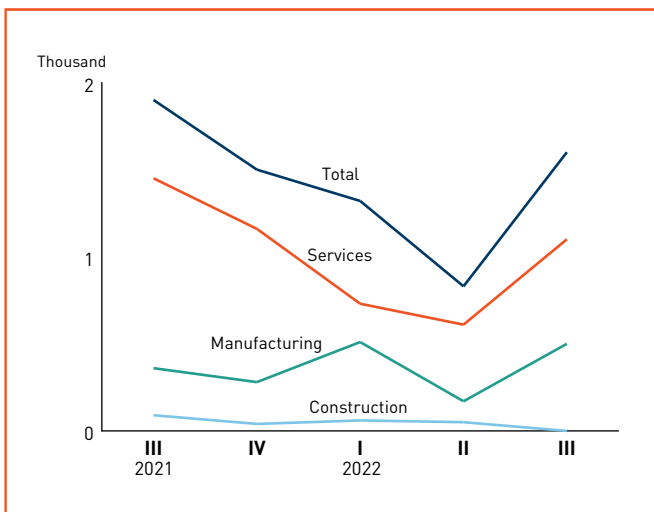
Employment[5]

Total employment increased by 83,100 on a quarter-on-quarter basis in the third quarter of 2022, larger than the gains recorded in the preceding quarter (71,100) (Exhibit 1.6). Excluding MDWs, total employment rose by 75,600. Both residents and non-residents registered employment growth in the third quarter, with non-residents accounting for the bulk of the overall employment increase following the significant relaxation of border restrictions in April 2022.

Total employment growth was largely driven by the overall services sector (+40,600; or +33,000 excluding MDWs), supported by employment gains in the other services (+12,400), professional services (+5,900) and information & communications (+5,500) sectors (Exhibit 1.7). Over the same period, employment in the construction and manufacturing sectors rose by 30,500 and 12,100, respectively.

Exhibit 1.6: Change in Total Employment, Quarter-on-Quarter

Exhibit 1.7: Changes in Employment by Industry in 3Q 2022

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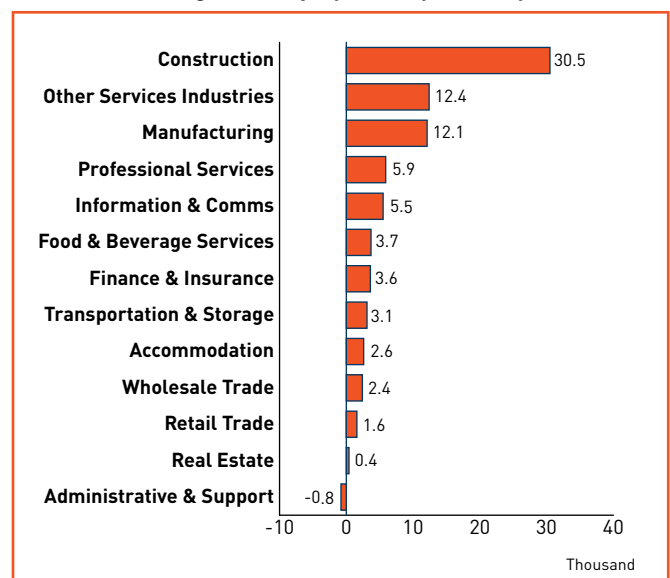
3   Based on seasonally-adjusted data on the number of unemployed persons.
4   This was the lowest quarterly retrenchment level on record since the start of the data series in 1998.
5   Based on preliminary estimates.

Hiring Expectations

According to EDB's latest Business Expectations Survey for the Manufacturing Sector, hiring expectations in the sector were positive. Specifically, a net weighted balance of 6 per cent of manufacturers expected to increase hiring in the fourth quarter of 2022 as compared to the third quarter. Firms in the infocomms & consumer electronics segment of the electronics cluster were the most optimistic, with a net weighted balance of 25 per cent of firms expecting to increase hiring in the fourth quarter. By contrast, firms in the medical technology segment of the biomedical manufacturing cluster were the most pessimistic, with a net weighted balance of 13 per cent of firms expecting a lower level of hiring in the fourth quarter.

Hiring expectations for services firms were also positive. According to DOS' latest Business Expectations Survey for the Services Sector, a net weighted balance of 15 per cent of services firms expected to increase hiring in the fourth quarter of 2022 as compared to the third quarter. Among the services sectors, firms in the accommodation sector had the strongest hiring sentiments, with a net weighted balance of 44 per cent of firms expecting to increase hiring in the fourth quarter. On the other hand, firms in the wholesale trade sector were the most pessimistic, with a net weighted balance of 1 per cent of firms expecting to hire fewer workers in the fourth quarter.

COMPETITIVENESS

Productivity

Overall labour productivity, as measured by real value-added per actual hour worked, declined by 1.7 per cent year-on-year in the third quarter of 2022, a reversal from the 1.0 per cent increase posted in the previous quarter (Exhibit 1.8).[6]

Exhibit 1.8: Changes in Value-Added per Actual Hour Worked for the Overall Economy and Sectors in 3Q 2022
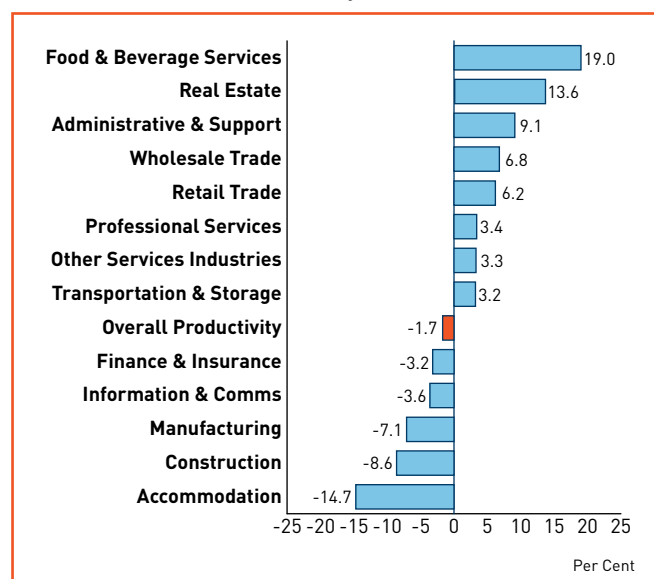
Among the sectors, the food & beverage services (19.0 per cent), real estate (13.6 per cent), administrative & support services (9.1 per cent), wholesale trade (6.8 per cent) and retail trade (6.2 per cent) sectors recorded the strongest productivity gains in the third quarter. The professional services (3.4 per cent), other services (3.3 per cent) and transportation & storage (3.2 per cent) sectors also saw productivity improvements. By contrast, productivity declines were observed in the accommodation (-14.7 per cent), construction (-8.6 per cent), manufacturing (-7.1 per cent), information & communications (-3.6 per cent) and finance & insurance (-3.2 per cent) sectors.

In the third quarter, the productivity of outward-oriented sectors as a whole declined by 1.6 per cent year-on-year, a turnaround from the 1.2 per cent growth in the previous quarter.[7] Meanwhile, the productivity of domestically-oriented sectors as a whole improved by 2.5 per cent year-on-year, moderating from the 3.8 per cent increase in the preceding quarter.

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6   Similarly, overall labour productivity, as measured by real value-added per worker, fell by 2.2 per cent in the third quarter of 2022, reversing the 0.9 per cent growth in the preceding quarter.
7   Outward-oriented sectors refer to manufacturing, wholesale trade, transportation & storage, accommodation, information & communications, finance & insurance and professional services. Domestically-oriented sectors refer to construction, retail trade, food & beverage services, real estate, administrative & support services and other services industries.

Unit Labour Cost and Unit Business Cost

Overall unit labour cost (ULC) for the economy rose by 7.5 per cent on a year-on-year basis in the third quarter of 2022, a moderation from the increase of 8.6 per cent in the preceding quarter (Exhibit 1.9). The rise in overall ULC during the quarter was due to the combined effect of an increase in total labour cost per worker and a fall in labour productivity as measured by real value-added per worker.

Exhibit 1.9: Changes in Unit Labour Cost in 3Q 2022
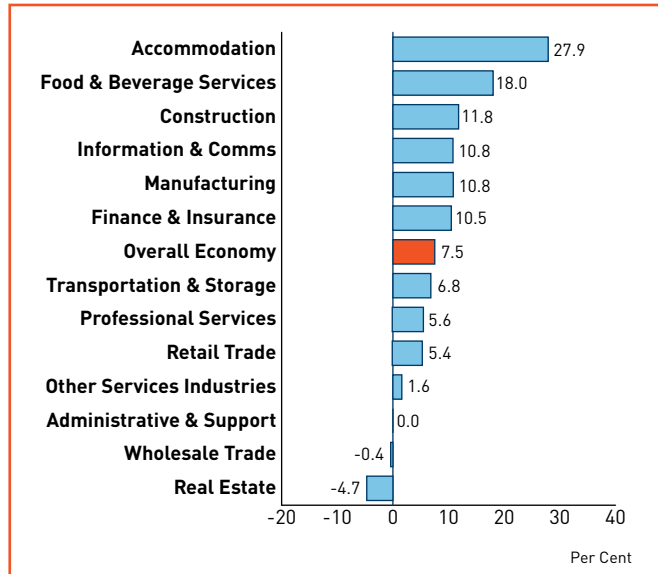
By sectors, the ULC for the construction sector was 11.8 per cent higher year-on-year in the third quarter as a decline in total labour cost per worker was more than offset by a fall in labour productivity.

The ULC for services producing industries rose by 5.7 per cent year-on-year. Among the services sectors, ULC increased the most for the accommodation sector (27.9 per cent), reflecting a significant pickup in total labour cost per worker alongside a decline in productivity. Meanwhile, ULC fell in the real estate (-4.7 per cent) and wholesale trade (-0.4 per cent) sectors.

Over the same period, the ULC for the manufacturing sector picked up by 10.8 per cent year-on-year. The rise in the sector's ULC occurred on the back of an increase in total labour cost per worker and a fall in productivity in the sector.

Unit business cost (UBC) for the manufacturing sector climbed by 8.6 per cent year-on-year in the third quarter, extending the 6.5 per cent increase in the previous quarter (Exhibit 1.10). The rise in UBC during the quarter was due to higher unit services costs (8.2 per cent) and manufacturing ULC (10.8 per cent), which more than offset a fall in unit non-labour production taxes (-0.8 per cent).

Exhibit 1.10: Changes in the Manufacturing Unit Business Cost
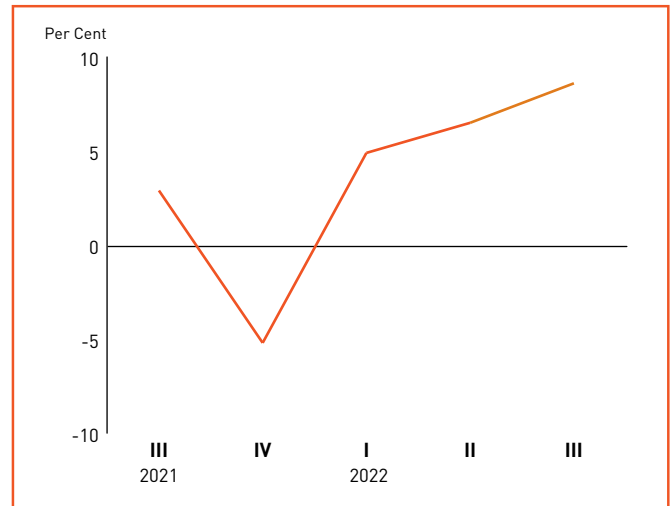
Investment Commitments

Investment commitments garnered by the Economic Development Board (EDB) in terms of Fixed Asset Investments (FAI) and Total Business Expenditure (TBE) amounted to $956 million and $1.6 billion respectively in the third quarter of 2022 (Exhibit 1.11 and Exhibit 1.12).

For FAI, the largest contribution came from the services sector, which attracted $544 million worth of commitments. Within the services sector, the infocommunications & media and research & development clusters garnered the largest amounts of commitments, at $399 million and $86.2 million respectively. Meanwhile, the biomedical manufacturing cluster attracted the most FAI commitments within the manufacturing sector, at $237 million. Local investors contributed the most to total FAI, at $469 million (or 49.1 per cent).

Exhibit 1.11: Fixed Asset Investments by Industry Cluster in 3Q 2022

Services Clusters 57.0%
Others 18.2%
Biomedical Manufacturing 24.8%
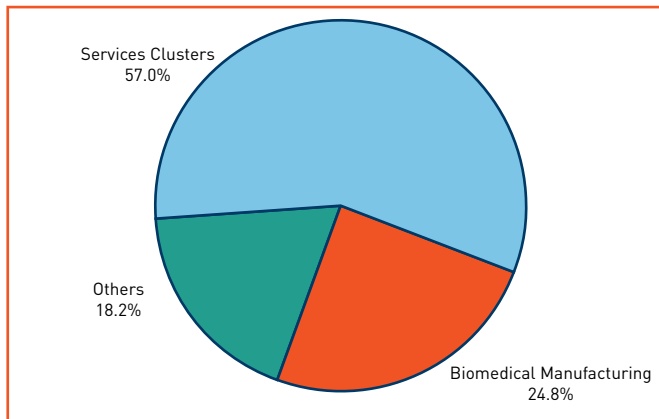
For TBE, the services sector attracted the highest amount of commitments, at $1.2 billion. Within the sector, the headquarters & professional services and infocommunications & media clusters garnered the most TBE commitments, at $908 million and $170 million respectively. Among the manufacturing clusters, the biomedical manufacturing and transport engineering clusters attracted the largest amounts of TBE commitments, at $226 million and $163 million respectively. Investors from the United States were the largest source of TBE commitments, with commitments of $593 million (or 37.1 per cent).

Exhibit 1.12: Total Business Expenditure by Industry Cluster in 3Q 2022

Headquarters & Professional Services 56.8%
Incommunications & Media 10.6%
Others 18.5%
Biomedical Manufacturing 14.1%
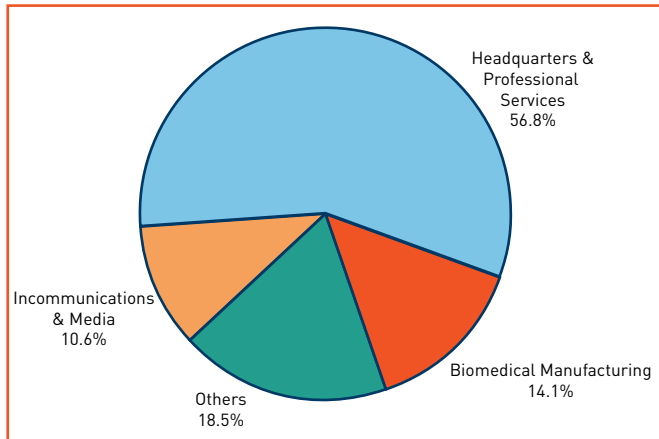
When these projects are fully implemented, they are expected to generate $4.4 billion of value-added and create more than 4,300 jobs in the coming years.

PRICES

Consumer Price Index

The Consumer Price Index-All Items (CPI-All Items) rose by 7.3 per cent on a year-on-year basis in the third quarter of 2022, a step-up from the 5.9 per cent increase in the preceding quarter (Exhibit 1.13). On a quarter-on-quarter seasonally-adjusted basis, CPI-All Items inflation came in at 1.8 per cent, lower than the 2.1 per cent recorded in the second quarter.

Exhibit 1.13: Changes in CPI
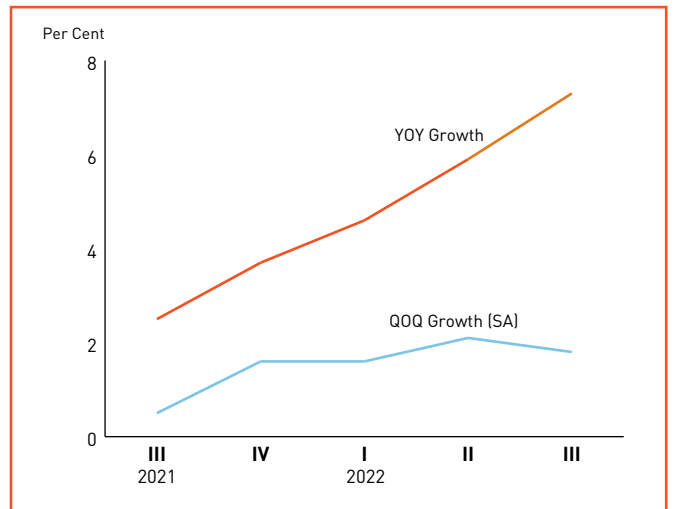
Price increases in the following CPI categories contributed positively to CPI-All Items inflation on a year-on-year basis in the third quarter (Exhibit 1.14). Food prices rose by 6.5 per cent on the back of an increase in the costs of food serving services like hawker food and restaurant meals, as well as non-cooked food items such as meat, bread & cereals and fish & seafood. Clothing & footwear prices picked up by 7.1 per cent due to more expensive ready-made garments and footwear. Housing & utilities costs increased by 6.0 per cent because of a rise in accommodation and electricity costs. Prices of household durables & services went up by 2.1 per cent as the prices of household durables increased. Healthcare costs rose by 2.7 per cent on account of the higher costs of outpatient services and hospital services. Transport costs climbed by 19.4 per cent as the costs of cars, petrol, air fares[8] and point-to-point transport services rose. Recreation & culture prices increased by 5.6 per cent as a result of a rise in the costs of holiday travel[9] and recreational & cultural services. Education costs picked up by 2.2 per cent due to higher fees at commercial institutions and universities. Prices of miscellaneous goods & services edged up by 0.5 per cent because of a rise in the cost of personal care items.

8   As overseas travel was limited in April 2020 – September 2022, a portion of the CPI for air fares was imputed using the overall change in CPI-All Items. However, with the easing of travel restrictions, actual air fares are increasingly being incorporated into the CPI
9   Similar to air fares, a portion of the CPI for holiday expenses was imputed using the overall change in CPI-All Items due to limited travel.

On the other hand, communication costs contributed negatively to CPI-All Items inflation on a year-on-year basis in the third quarter, falling by 0.8 per cent on account of lower prices for telecommunication services.

Exhibit 1.14: Percentage Changes in CPI over Corresponding Quarter of Previous Year

Per Cent

	2021		2022		
	III	IV	I	II	III
All items	2.5	3.7	4.6	5.9	**7.3**
Food	1.4	1.9	2.7	4.7	**6.5**
Clothing & Footwear	-5.6	-5.3	-3.5	2.8	**7.1**
Housing & Utilities	2.1	3.1	4.2	5.1	**6.0**
Housing Durables & Services	1.6	1.8	1.7	2.1	**2.1**
Healthcare	1.7	1.6	1.5	1.6	**2.7**
Transport	8.7	13.0	15.4	16.6	**19.4**
Communication	-2.0	-1.3	-2.6	-0.9	**-0.8**
Recreation & Culture	1.4	2.0	1.4	3.8	**5.6**
Education	1.3	1.7	2.1	2.2	**2.2**
Miscellaneous Goods & Services	-0.4	-0.2	0.1	0.2	**0.5**

INTERNATIONAL TRADE

Merchandise Trade

Singapore's total merchandise trade expanded by 25.7 per cent on a year-on-year basis in the third quarter of 2022, extending the 28.1 per cent growth in the preceding quarter (Exhibit 1.15). The increase in total merchandise trade was due to both oil and non-oil trade, which rose by 65.8 per cent and 18.0 per cent respectively.

Exhibit 1.15: Growth Rates of Total Merchandise Trade, Merchandise Exports and Merchandise Imports (In Nominal Terms)

Per Cent

	2021			2022		
	III	IV	ANN	I	II	III
Merchandise Trade	19.0	28.8	19.7	20.8	28.1	**25.7**
Merchandise Exports	17.4	26.9	19.1	18.8	24.9	**23.5**
Domestic Exports	18.8	34.8	19.0	20.8	28.5	**28.0**
Oil	49.2	78.2	38.0	45.4	72.9	**75.2**
Non-Oil	9.0	20.1	12.1	11.4	8.9	**7.2**
Re-Exports	16.2	21.1	19.2	17.2	21.8	**19.8**
Merchandise Imports	20.9	31.0	20.4	23.1	31.6	**28.2**
Oil	51.9	94.8	49.4	50.7	66.7	**58.8**
Non-Oil	15.6	21.2	15.3	17.4	23.5	**21.3**

Total merchandise exports saw a robust expansion of 23.5 per cent in the third quarter, following the 24.9 per cent increase in the preceding quarter, contributed by both domestic exports (28.0 per cent) and re-exports (19.8 per cent).

The growth in domestic exports was on account of an expansion in both oil domestic exports and non-oil domestic exports (NODX). In particular, oil domestic exports surged by 75.2 per cent due to higher oil prices. In volume terms, oil domestic exports rose by 18.6 per cent.

Meanwhile, NODX rose by 7.2 per cent in the third quarter, following the 8.9 per cent growth in the previous quarter. The rise in NODX was supported by higher non-electronics domestic exports. By contrast, electronics domestic exports declined after nine consecutive quarters of growth.

Total merchandise imports increased by 28.2 per cent in the third quarter, following the 31.6 per cent expansion in the previous quarter. Both oil and non-oil imports rose during the quarter. Specifically, oil imports climbed by 58.8 per cent, while non-oil imports picked up by 21.3 per cent due to higher electronics and non-electronics imports.

Services Trade

Total services trade expanded by 14.2 per cent on a year-on-year basis in the third quarter of 2022, stepping up from the 13.1 per cent increase in the previous quarter (Exhibit 1.16). Both the exports and imports of services saw positive year-on-year growth during the quarter.

Exhibit 1.16: Growth Rates of Total Services Trade, Services Exports and Services Imports (In Nominal Terms)

Per Cent

	2021			2022		
	III	IV	ANN	I	II	III
Total Services Trade	11.5	10.6	6.8	9.9	13.1	**14.2**
Services Exports	11.1	9.2	6.7	10.9	13.8	**15.8**
Services Imports	11.8	12.1	6.8	8.9	12.4	**12.4**

Services exports rose at a faster pace of 15.8 per cent in the third quarter, compared to the 13.8 per cent increase in the preceding quarter. The increase in services exports was largely attributable to a pickup in the exports of transport services, travel services and other business services. Meanwhile, services imports expanded by 12.4 per cent, extending the 12.4 per cent increase in the previous quarter. The rise in services imports was mainly due to an increase in the imports of travel services, transport services and other business services.

BALANCE OF PAYMENTS

The overall balance of payments deficit narrowed to $26.4 billion in the third quarter of 2022, from $74.2 billion in the preceding quarter (Exhibit 1.17).

Exhibit 1.17: Balance of Payments
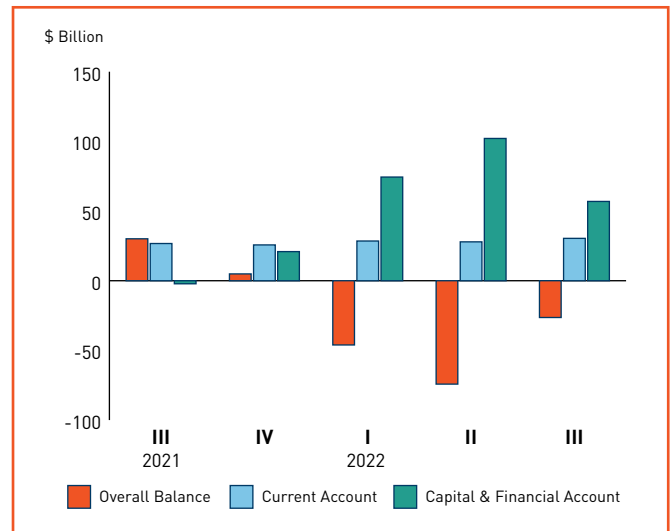
Current Account

The current account surplus increased to $30.4 billion in the third quarter of 2022, from $27.9 billion in the previous quarter. This was due to an increase in the services trade surplus and a narrowing of the primary income deficit, which more than offset a decline in the goods trade surplus and a widening of the secondary income deficit.

The surplus in the goods balance fell by $1.3 billion to $44.0 billion in the third quarter, as goods imports increased by more than goods exports.

By contrast, the surplus in the services balance rose by $1.6 billion to $5.9 billion in the third quarter. This was mainly due to a fall in net payments for travel services, which outweighed an increase in net payments for telecommunications, computer & information services.

At the same time, the primary income deficit narrowed by $2.6 billion to $17.5 billion in the third quarter, as primary income receipts rose slightly while payments fell.

The secondary income deficit edged up to $2.1 billion from $1.7 billion on the back of a larger increase in secondary income payments as compared to receipts.

Capital and Financial Account

The capital and financial account registered a net outflow of $56.9 billion in the third quarter of 2022, smaller than the net outflow of $102 billion recorded in the preceding quarter. The decrease was largely driven by a fall in the net outflows of "other investment" and portfolio investment, as well as an increase in the net inflows of direct investment. These more than offset a fall in the net inflows of financial derivatives.

Net outflows of "other investment" fell to $64.1 billion in the third quarter, from $102 billion in the previous quarter.

Similarly, net outflows of portfolio investment decreased by $5.8 billion to $19.4 billion in the third quarter.

At the same time, net inflows of direct investment increased to $23.6 billion in the third quarter, from $20.9 billion in the preceding quarter, as foreign direct investments into Singapore rose and residents' direct investments abroad fell.

By contrast, net inflows of financial derivatives decreased by $1.0 billion to $2.9 billion in the third quarter.

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10 *Net inflows in net balances are indicated by a minus (-) sign. For more details regarding the change in sign convention to the financial account, please refer to DOS's information paper on "Singapore's International Accounts: Methodological Updates and Recent Developments".*
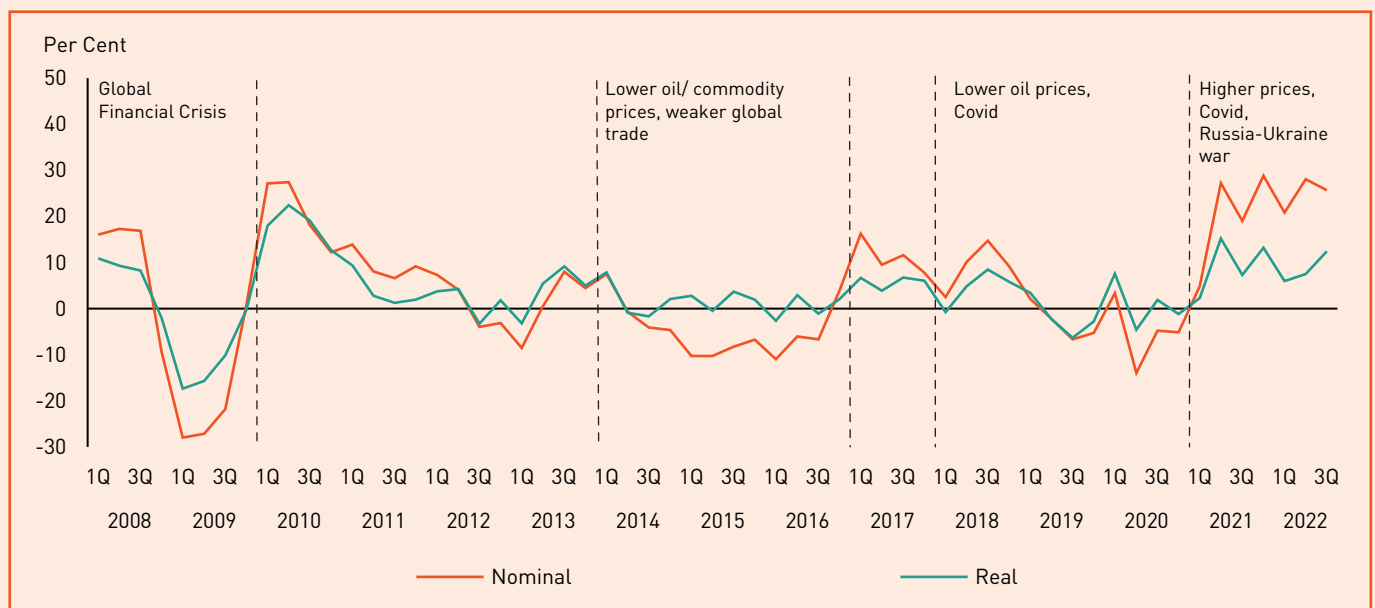
NOMINAL AND REAL TRADE PERFORMANCE IN THE FIRST THREE QUARTERS OF 2022[1]

In the first three quarters of 2022, total trade[2] growth in nominal terms outpaced that in real terms

Singapore's total trade rose by 24.9 per cent year-on-year (y-o-y) in nominal terms in the first three quarters of 2022 [Exhibit 1]. Over this period, total trade in real terms grew at a slower pace of 8.7 per cent y-o-y. This article examines the drivers of Singapore's nominal and real trade growth.

Exhibit 1: Nominal and Real Total Merchandise Trade Growth (Year-on-Year, Y-o-Y), 2008 - 3Q 2022

Source: Enterprise Singapore

Both oil trade and electronics trade contributed to total trade growth in nominal and real terms in the first three quarters of the year, with their growth in nominal terms faster than that in real terms

Oil trade and electronics trade are major components of total trade, accounting for 16.3 per cent and 36.1 per cent of nominal total trade respectively in 2021. In the first three quarters of 2022, oil trade and electronics trade expanded in both nominal and real terms [Exhibit 2], thereby contributing to growth in nominal and real total trade:

    a. <u>Oil trade</u>. In nominal terms, oil trade grew by 61.8 per cent y-o-y in the first three quarters of 2022, much faster than its 1.4 per cent growth in real terms over the same period. The stark difference in nominal and real oil trade growth was attributable to the sharp rise in oil prices following the onset of the Russia-Ukraine war.[3] In terms of its contribution to total trade, oil trade contributed to 39.3 per cent of nominal total trade growth (i.e., 9.8 percentage-points, pp) and 2.8 per cent of real total trade growth (i.e., 0.2 pp) during this period.

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1   *The views expressed in this paper are solely those of the authors and do not necessarily reflect those of the Ministry of Trade and Industry or the Government of Singapore. We would like to thank Ms Yong Yik Wei for her useful suggestions and comments. All errors belong to the authors.*
2   *This refers to total merchandise trade (i.e., sum of merchandise exports and imports).*
3   *Oil prices increased by 54.9 per cent y-o-y in the first three quarters of 2022.*

b. <u>Electronics trade</u>. Electronics trade increased by 16.9 per cent and 10.4 per cent y-o-y in nominal and real terms respectively in the first three quarters of 2022. The faster growth in nominal electronics trade generally reflected higher electronics prices amidst robust global demand for electronics (e.g., semiconductors). In terms of its contribution to total trade, electronics trade accounted for 24.5 per cent of nominal total trade growth (i.e., 6.1 pp) and 43.4 per cent of real total trade growth (i.e., 3.8 pp).

However, a closer examination of their quarterly growth profiles suggests that electronics trade has eased over the course of the year, while oil trade has remained broadly resilient. Specifically, both nominal and real electronics trade growth trended down from 1Q22 to 3Q22 amidst the weakening outlook for the global electronics industry following a longer-than-usual upcycle. By contrast, both nominal and real oil trade growth trended up from 1Q22 to 3Q22 on the back of elevated oil prices and an improvement in real oil trade. These trends suggest that electronics trade will increasingly weigh on the performance of total trade for the rest of the year, even as oil trade continues to provide some support.

**Exhibit 2: Oil and Electronics Trade Growth (Year-on-Year, Y-o-Y), 2020 - 3Q 2022**
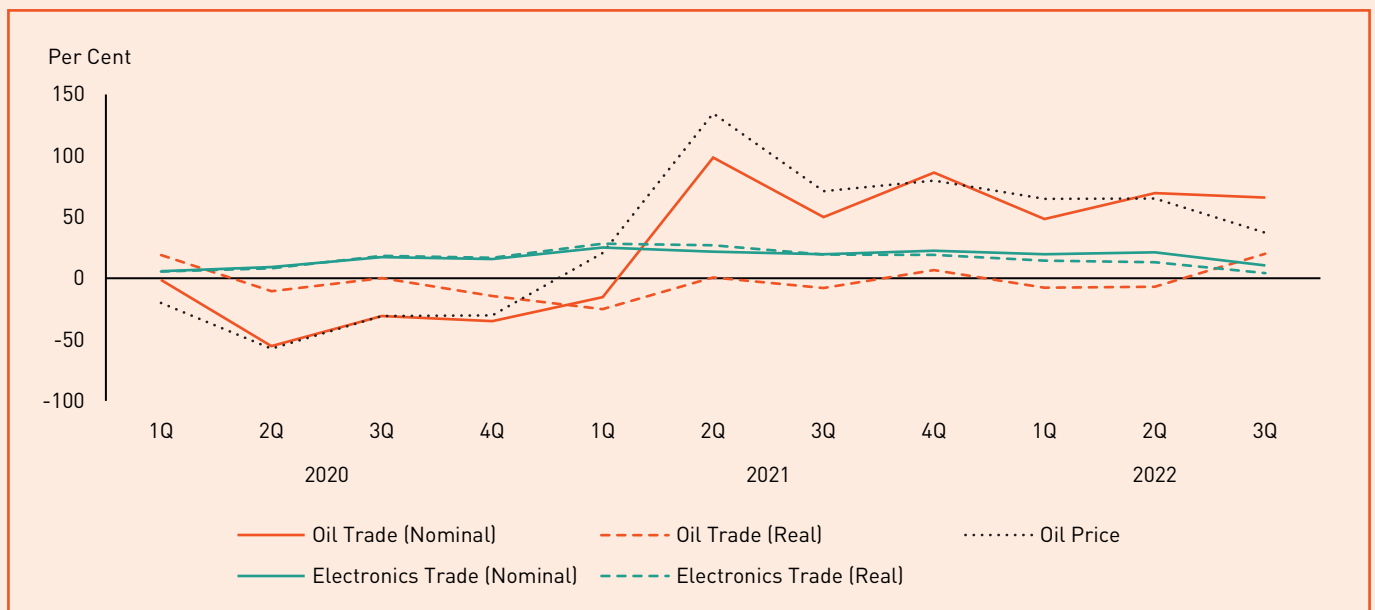
Source: Enterprise Singapore

Meanwhile, NODX rose in nominal terms but declined in real terms in the first three quarters of 2022

In the first three quarters of 2022, non-oil domestic exports (NODX) rose by 9.1 per cent y-o-y in nominal terms on the back of rising export prices, but fell marginally by 1.1 per cent y-o-y in real terms [Exhibit 3]. The performance of NODX in both nominal and real terms was partly driven by electronics NODX[4]. Specifically, nominal electronics NODX increased by 6.5 per cent y-o-y on the back of higher electronics prices, contributing 16 per cent to nominal NODX growth (or 1.5 pp) over this period. On the other hand, real electronics NODX declined by 3.9 per cent y-o-y from a high base last year, thereby contributing 80 per cent to the fall in real NODX (or -0.9 pp).

Similar to the trends in overall electronics trade, the performance of electronics NODX has deteriorated over the course of the year. In particular, nominal electronics NODX posted its first y-o-y decline in 3Q22 (-1.8 per cent) after nine consecutive quarters of growth, while real electronics NODX contracted more significantly in 3Q22 as compared to the start of the year. The weakening of electronics NODX reflects the fall in end-consumer demand for electronics products like handphones and PCs amidst heightened economic uncertainty and a softening global economic outlook.

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4   *Electronics NODX accounted for close to 25% of NODX in nominal terms in 2021.*

Exhibit 3: NODX and Electronics NODX Growth (Year-on-Year, Y-o-Y), 2020 - 3Q 2022
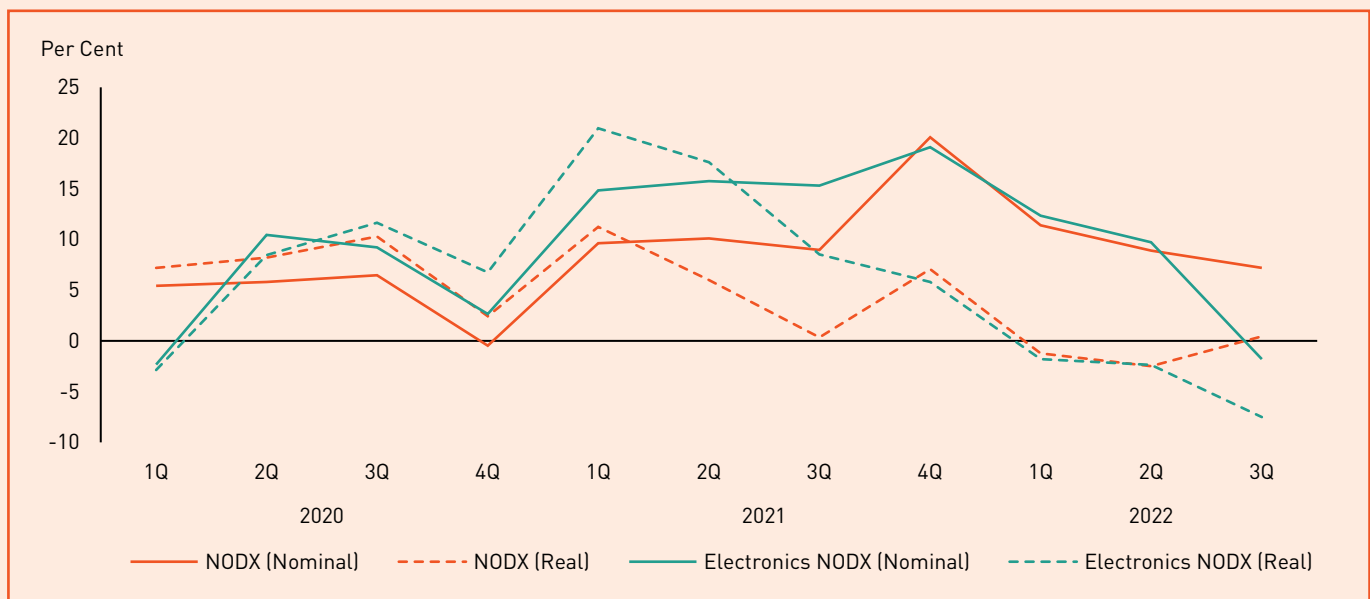
Source: Enterprise Singapore

Looking ahead to 2023, the outlook for total trade and NODX has weakened

In 2021, both total trade and NODX reached historic highs in nominal and real terms. Total trade continued to grow in both nominal and real terms in the first three quarters of 2022, supported by oil trade even though electronics trade saw signs of deterioration. Similarly, nominal NODX continued to expand over this period on the back of rising export prices in an inflationary environment, even as real NODX declined. The fall in real electronics NODX from a high base last year was a contributor to the decline in real NODX.

Looking ahead, and barring fresh supply shocks, oil prices are expected to ease in 2023 from 2022's level in tandem with the slowdown in the global economy.[5] Globally, the electronics outlook has also weakened, with semiconductor and computer peripheral firms expressing concerns over the rapid softening in consumer demand. As such, support from the key growth drivers of NODX – electronics – and total trade – oil and electronics – could be limited going into 2023.

Contributed by:

Mr Ang Yu Sheng, Economist
Dr Andy Feng, Principal Economist
Economics Division
Ministry of Trade and Industry

Mr Ivan Ng, Senior Business Partner
Ms Zhu Peiling Miki, Deputy Director
Business & Trade Insights
Enterprise Singapore

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5   Brent crude oil prices averaged US$71/barrel in 2021. Prices are estimated at US$102/barrel and US$95/ barrel for 2022 and 2023 respectively. (Source: The U.S. Energy Information Administration)

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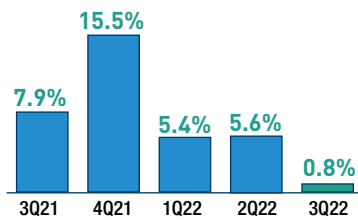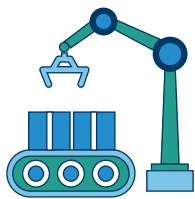
CHAPTER

02

SECTORAL
PERFORMANCE

SECTORAL PERFORMANCE

MANUFACTURING

REAL GROWTH

3Q21	4Q21	1Q22	2Q22	3Q22
7.9%	15.5%	5.4%	5.6%	0.8%

CLUSTERS IN MANUFACTURING SECTOR (Y-O-Y CHANGE)

30.5% Transport Engineering

19.0% General Manufacturing Industries

8.5% Precision Engineering
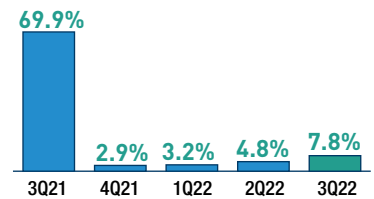
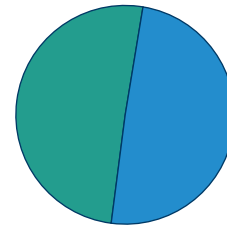**-1.4%** Biomedical Manufacturing

-4.8% Chemicals

-6.7% Electronics

CONSTRUCTION

REAL GROWTH

3Q21	4Q21	1Q22	2Q22	3Q22
69.9%	2.9%	3.2%	4.8%	7.8%

CERTIFIED PAYMENTS IN 3Q22

49.8% Public

50.2% Private

CONTRACTS AWARDED IN 3Q22 (Y-O-Y CHANGE)

Industrial	Civil Engineering	Institutional & Others	Residential	Commercial
75.5%	24.5%	-47.6%	-52.0%	-73.0%

WHOLESALE TRADE

REAL GROWTH

3Q21	5.5%
4Q21	3.3%
1Q22	4.8%
2Q22	1.6%
3Q22	5.4%
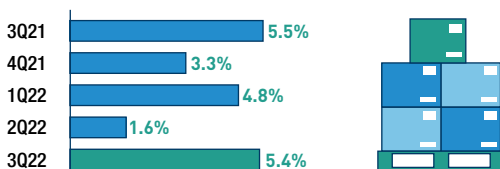
Foreign Wholesale Trade Index Growth **3.6%**

Domestic Wholesale Trade Index Growth **-6.4%**

RETAIL TRADE

REAL GROWTH

3Q21	0.9%
4Q21	4.3%
1Q22	5.0%
2Q22	12.3%
3Q22	8.9%
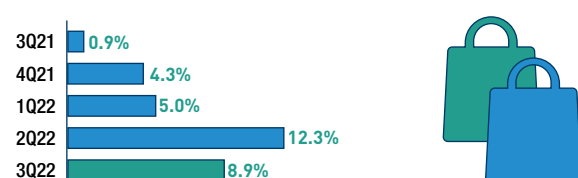
Retail Sales Index Growth (Non-Motor Vehicles) **14.1%**

Retail Sales Index Growth (Motor Vehicles) **-22.3%**

ACCOMMODATION
REAL GROWTH

3Q21	4Q21	1Q22	2Q22	3Q22
-5.7%	-5.1%	-8.7%	-3.4%	-1.9%

OCCUPANCY RATES OF HOTELS (Y-O-Y CHANGE)

Luxury **22.4%-pt**

Upscale **23.0%-pt**

Mid-Tier **25.7%-pt**

Economy **15.8%-pt**
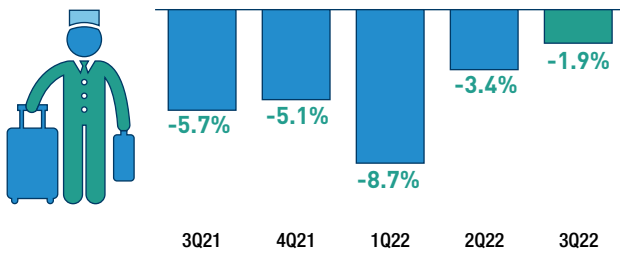
FOOD & BEVERAGE SERVICES
REAL GROWTH

3Q21	4Q21	1Q21	2Q22	3Q22
-4.1%	-1.5%	2.1%	23.4%	30.5%
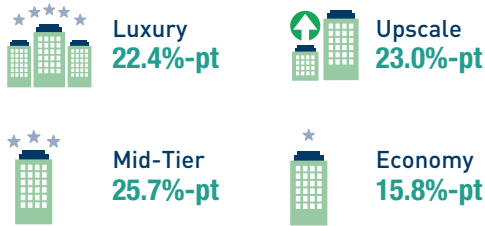
F&B SALES INDEX GROWTH (Y-O-Y CHANGE)

Food Caterers **117%**

Restaurants **49.8%**

Others **13.5%**

Fast Food Outlets **9.3%**

TRANSPORTATION & STORAGE
REAL GROWTH

3Q21	9.2%
4Q21	7.5%
1Q22	4.3%
2Q22	5.0%
3Q22	6.8%

Total Sea Cargo Handled Growth **-1.3%**

Air Passengers Handled Growth **1,481%**
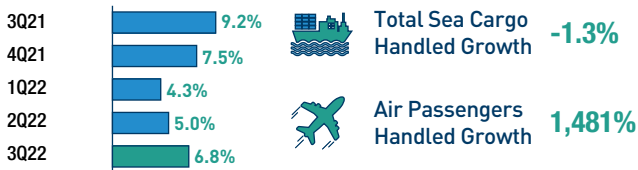
FINANCE & INSURANCE
REAL GROWTH

3Q21	4Q21	1Q22	2Q22	3Q22
8.5%	5.6%	3.6%	2.4%	0.4%

REAL ESTATE
REAL GROWTH

3Q21	19.9%
4Q21	1.6%
1Q22	10.5%
2Q22	11.1%
3Q22	11.7%
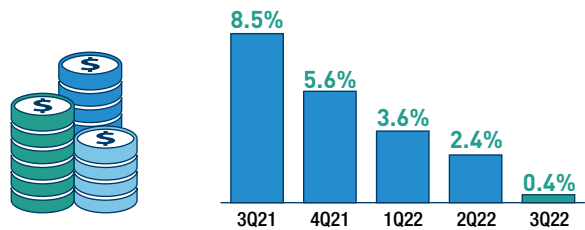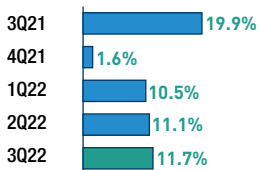
PRIVATE RESIDENTIAL REAL ESTATE

Units Transacted (Y-O-Y Change) **-32.3%**

Price Index (Q-O-Q Change) **3.8%**
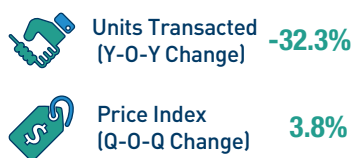
OVERVIEW

In the third quarter of 2022,

- The manufacturing sector expanded by 0.8 per cent year-on-year, moderating from the 5.6 per cent growth in the preceding quarter. Growth was supported by output expansions in the transport engineering, general manufacturing and precision engineering clusters.

- The construction sector grew at a faster pace of 7.8 per cent year-on-year, compared to the 4.8 per cent expansion in the previous quarter.

- Growth in the wholesale trade sector came in at 5.4 per cent year-on-year, accelerating from the 1.6 per cent recorded in the preceding quarter.

- The retail trade sector expanded by 8.9 per cent year-on-year, moderating from the 12.3 per cent expansion in the second quarter.

- The transportation & storage sector posted growth of 6.8 per cent year-on-year, faster than the 5.0 per cent growth recorded in the previous quarter.

- The accommodation sector shrank by 1.9 per cent year-on-year, easing from the 3.4 per cent contraction in the preceding quarter.

- Growth in the food & beverage services sector accelerated to 30.5 per cent year-on-year, from 23.4 per cent in the previous quarter.

- The finance & insurance sector grew at a slower pace of 0.4 per cent year-on-year, compared to the 2.4 per cent expansion in the second quarter.

- The real estate sector expanded by 11.7 per cent year-on-year, extending the 11.1 per cent growth in the previous quarter.

- The professional services sector recorded growth of 8.3 per cent year-on-year, similar to the 8.2 per cent expansion in the preceding quarter.

MANUFACTURING

The manufacturing sector expanded by 0.8 per cent on a year-on-year basis in the third quarter of 2022, moderating from the 5.6 per cent growth in the previous quarter (Exhibit 2.1). Growth was supported by output expansions in the transport engineering, general manufacturing and precision engineering clusters (Exhibit 2.2).

Exhibit 2.1: Manufacturing Sector's Growth Rate
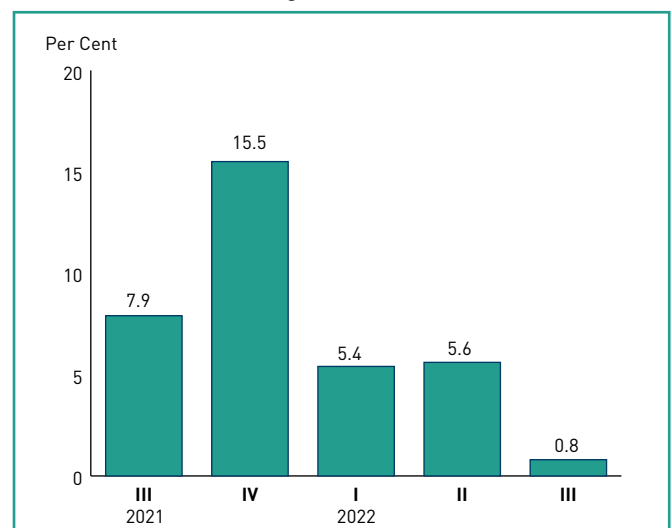
Exhibit 2.2: Manufacturing Clusters' Growth Rates in 3Q 2022
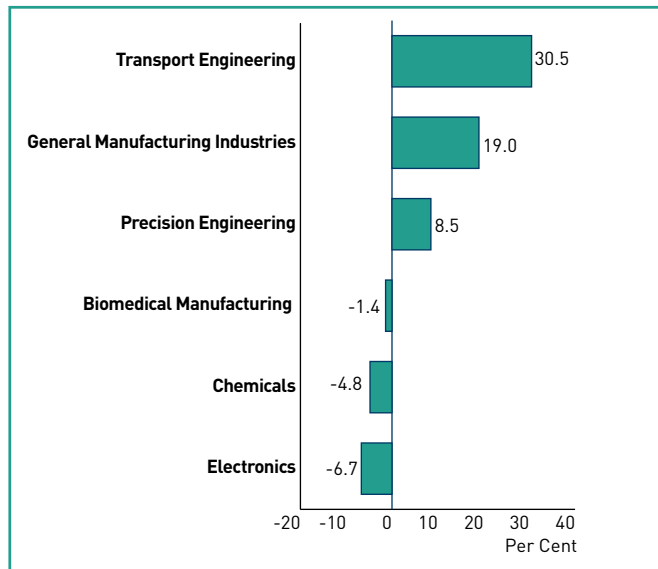
Output in the transport engineering cluster surged by 30.5 per cent year-on-year in the third quarter, supported by expansions in the marine & offshore engineering (M&OE) and aerospace segments. The M&OE segment expanded by 50.4 per cent, supported by a higher level of activity in the shipyards, as well as an increase in production of oilfield & gasfield equipment. Similarly, in the aerospace segment, output grew by 31.3 per cent, boosted by higher demand for aircraft parts from the US as well as more maintenance, repair & overhaul (MRO) jobs from commercial airlines on the back of increased global air traffic. By contrast, the land segment contracted by 11.8 per cent.

The general manufacturing cluster expanded by 19.0 per cent year-on-year, supported by output expansions across all segments. In particular, the food, beverages & tobacco segment grew by 25.5 per cent as the output of beverage and dairy products rose. Meanwhile, the miscellaneous industries and printing segments expanded by 12.1 per cent and 9.0 per cent respectively, with the former recording a higher level of production of structural metal products and wearing apparel.

Output in the precision engineering cluster rose by 8.5 per cent year-on-year, supported by a 15.5 per cent increase in the output of the machinery & systems (M&S) segment. Growth of the M&S segment was bolstered by an increase in the production of semiconductor equipment. On the other hand, the precision modules & components segment contracted by 5.7 per cent on account of a lower level of production of optical products and bonding wire.

By contrast, the biomedical manufacturing cluster contracted by 1.4 per cent year-on-year on the back of a 10.1 per cent decline in the output of the pharmaceuticals segment. The latter could be attributed to a different mix of active pharmaceutical ingredients (APIs) produced. On the other hand, output in the medical technology segment rose by 11.8 per cent due to strong demand for medical devices from the US, Europe and China.

Output in the chemicals cluster fell by 4.8 per cent year-on-year, driven by a fall in the output of the petrochemicals (-12.6 per cent) and other chemicals (-10.6 per cent) segments. The petrochemicals segment recorded a lower level of output amidst plant maintenance shutdowns and weaker market demand, while the other chemicals segment reported a drop in production due to a decline in the output of fragrances. Meanwhile, the specialty segment contracted by 1.4 per cent on account of a lower level of production of mineral oil additives and industrial gases. Conversely, the output of the petroleum segment grew by 10.7 per cent due to strong demand for jet fuel, driven by increased global air traffic with the relaxation of COVID-19 travel restrictions in many countries.

The electronics cluster shrank by 6.7 per cent year-on-year, driven by output declines across all segments, except for the infocomms & consumer electronics segment. Output of the other electronic modules & components, computer peripherals & data storage and semiconductors segments fell by 22.8 per cent, 11.6 per cent and 6.1 per cent respectively on the back of softening external demand. By contrast, output in the infocomms & consumer electronics segment grew by 1.1 per cent.

CONSTRUCTION

The construction sector grew by 7.8 per cent year-on-year in the third quarter of 2022, faster than the 4.8 per cent expansion in the previous quarter.

In the third quarter, nominal certified progress payments (a proxy for construction output) rose by 16.8 per cent year-on-year, an improvement from the 10.6 per cent increase recorded in the previous quarter (Exhibit 2.3). Higher certified progress payments were seen in both the private (11.9 per cent) and public (22.1 per cent) sectors. The growth in private certified progress payments was largely driven by higher outturns in private residential (29.7 per cent) and commercial (32.7 per cent) building works. Meanwhile, the increase in public certified progress payments was led by expansions in public residential building (65.3 per cent) and civil engineering (13.8 per cent) works.

Exhibit 2.3: Changes in Contracts Awarded and Certified Payments
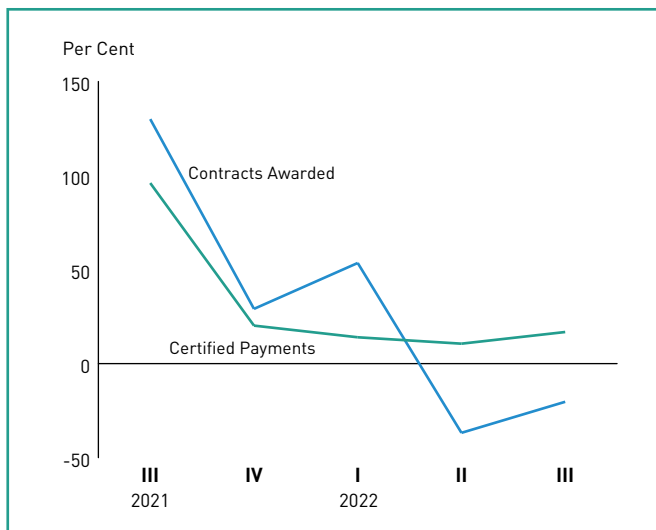
On the other hand, construction demand in terms of contracts awarded fell by 20.3 per cent year-on-year in the third quarter, extending the 36.8 per cent decline in the previous quarter (Exhibit 2.3). The fall in contracts awarded during the quarter was on account of lower demand for private (-6.9 per cent) and public (-29.4 per cent) sector construction works. The former was led by a fall in contracts awarded for private residential (-72.7 per cent) and commercial (-73.6 per cent) building works, while the latter was driven by a decline in contracts awarded for public residential (-34.3 per cent) and institutional & others (-46.7 per cent) building works.
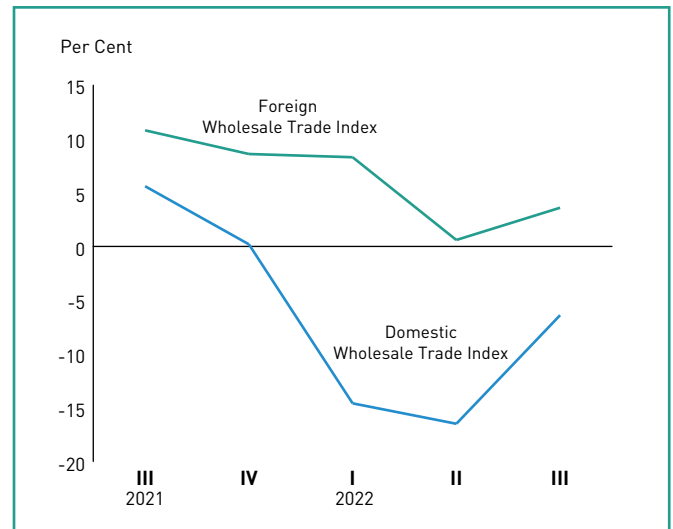
WHOLESALE TRADE

The wholesale trade sector grew by 5.4 per cent year-on-year in the third quarter of 2022, extending the 1.6 per cent expansion in the previous quarter.

Growth in the sector was supported by a 3.6 per cent year-on-year increase in foreign wholesale trade sales volume over the same period (Exhibit 2.4). The latter was higher than the 0.6 per cent expansion recorded in the previous quarter. The increase in foreign wholesale trade sales volume in the third quarter could be attributed to a pickup in the sales volumes of other wholesale trade[1] (19.0 per cent), petroleum & petroleum products (4.1 per cent) and telecommunications & computers (12.9 per cent).

On the other hand, the domestic wholesale trade sales volume declined by 6.4 per cent year-on-year, albeit better than the 16.5 per cent contraction in the previous quarter. The decline was primarily due to a fall in the sales volumes of petroleum & petroleum products (-13.9 per cent), general wholesale trade (-20.3 per cent) and electronic components (-2.8 per cent).

Exhibit 2.4: Changes in Real Non-Oil Domestic Exports and Real Non-Oil Re-exports

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1   The "other wholesale trade" segment consists of a diverse range of products that include agricultural raw materials and live animals, tropical produce, personal effects and medicinal and pharmaceutical products, among others.

RETAIL TRADE

The retail trade sector posted growth of 8.9 per cent year-on-year in the third quarter of 2022, moderating from the 12.3 per cent expansion in the previous quarter.

In the third quarter, overall retail sales volume increased by 8.7 per cent year-on-year, following the 10.9 per cent growth in the preceding quarter (Exhibit 2.5). The strong growth was partly due to the low base in the third quarter of last year when overall retail sales volume was weighed down by the implementation of Heightened Alert (HA) measures[2]. Growth in overall retail sales volume in the third quarter of 2022 could be attributed to non-motor vehicular sales (14.1 per cent), as motor vehicular sales (-22.3 per cent) saw a decline due to a reduction in Certificate of Entitlement (COE) quotas[3].

Non-motor vehicular sales volume was supported by a strong pickup in sales in segments with a greater reliance on in-person shopping and tourism demand, such as wearing apparel & footwear (52.1 per cent year-on-year), department stores (35.2 per cent) and cosmetics, toiletries & medical goods (18.3 per cent). In turn, their growth was supported by the relaxation of domestic and travel restrictions in the third quarter of 2022 compared to the same period in 2021[4]. By contrast, the sales volumes of supermarkets & hypermarkets (-9.7 per cent) and mini-marts & convenience stores (-7.5 per cent) shrank because of their high bases during the HA period a year ago.

**Exhibit 2.5: Changes in Retail Sales Index in Chained Volume Terms**
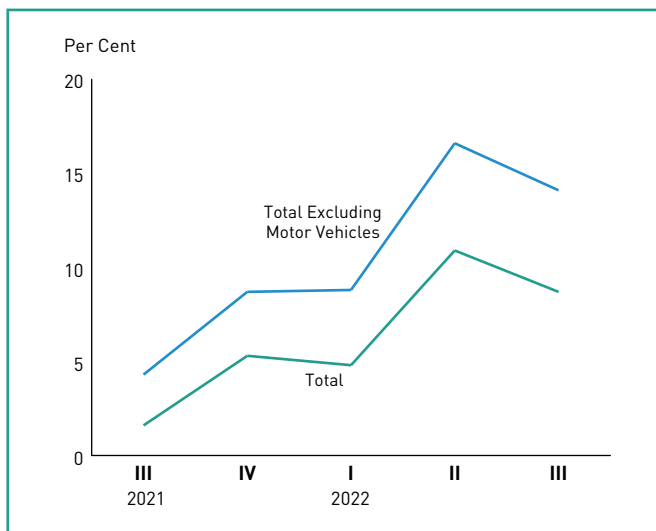
TRANSPORTATION & STORAGE

The transportation & storage sector expanded by 6.8 per cent year-on-year in the third quarter of 2022, improving from the 5.0 per cent growth in the previous quarter. The air transport, land transport and water transport segments all saw growth during the quarter.

In the water transport segment, the volume of sea cargo handled fell by 1.3 per cent year-on-year in the third quarter, easing from the 5.1 per cent decline in the previous quarter (Exhibit 2.6). The drop in sea cargo volume handled was due to lower general cargo volume (-3.0 per cent), although oil-in-bulk cargo volume grew (2.3 per cent). Meanwhile, container throughput expanded by 2.0 per cent during the quarter.

**Exhibit 2.6: Changes in Container Throughput and Sea Cargo Handled**
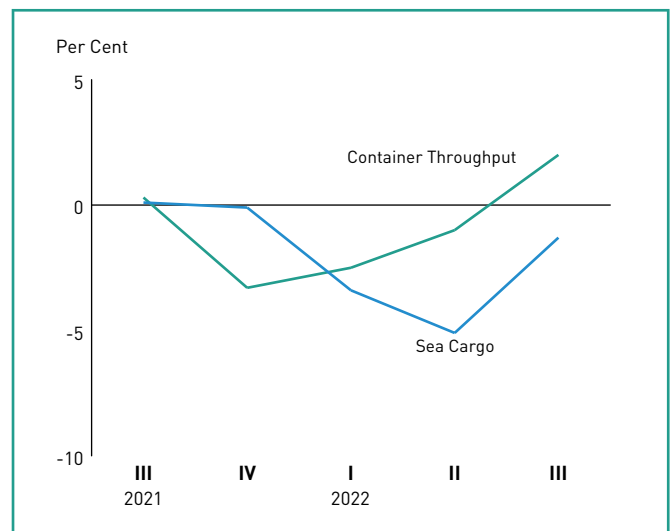
By contrast, the air transport segment expanded robustly in the third quarter, as Singapore continued to benefit from the rollout of the Vaccinated Travel Framework (VTF) since April 2022.[5] In particular, the volume of air passenger traffic handled at Changi Airport surged by 1,481 per cent year-on-year in the third quarter, extending the 1,306 per cent increase in the previous quarter (Exhibit 2.7). The high growth rates in both quarters were due to the low bases in the second and third quarters of 2021 when the volume of air passenger traffic had plunged by around 96 per cent from its pre-COVID levels (i.e., in the second and third quarters of 2019 respectively). In absolute terms, while air passenger traffic volume saw a sharp rebound in the third quarter of 2022, it remained 41.9 per cent below its pre-COVID level in the third quarter of 2019.

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2   *For instance, from 22 July to 9 August 2021, dining-in was not allowed and group sizes were restricted to two persons. By contrast, restrictions on dine-in and group size were lifted on 26 April 2022.*

3   *The lower COE quotas in the third quarter of 2022 were largely due to a decline in the number of vehicles deregistered over the period of January to March 2022. The drop was exacerbated by a high base in the third quarter of 2021 due to the redistribution of COE quotas from the suspension of COE bidding exercises during the Circuit Breaker period in 2020.*

4   *In the third quarter of 2021, most international visitors had to serve a Stay-Home Notice (SHN) period of two weeks upon arrival. By contrast, the Vaccinated Travel Framework (VTF) that was rolled out on 1 April 2022 extended quarantine-free travel to most vaccinated travellers. The VTF later extended quarantine-free travel to all travellers regardless of vaccination status from 29 August 2022 onwards.*

5   *Singapore's travel restrictions were looser in the third quarter of 2022 as compared to that in the third quarter of 2021, as Vaccinated Travel Lanes (VTLs) and the VTF were only rolled out in the third quarter of 2021 and second quarter of 2022 respectively.*

Meanwhile, total air cargo shipments handled at Changi Airport declined by 6.0 per cent year-on-year in the third quarter, extending the 3.7 per cent contraction in the previous quarter. Reflecting the recovery in air travel, the number of aircraft landings climbed by 117 per cent year-on-year to reach 30,550 in the third quarter, faster than the 96.9 per cent increase in the preceding quarter.

Exhibit 2.7: Changes in Air Transport
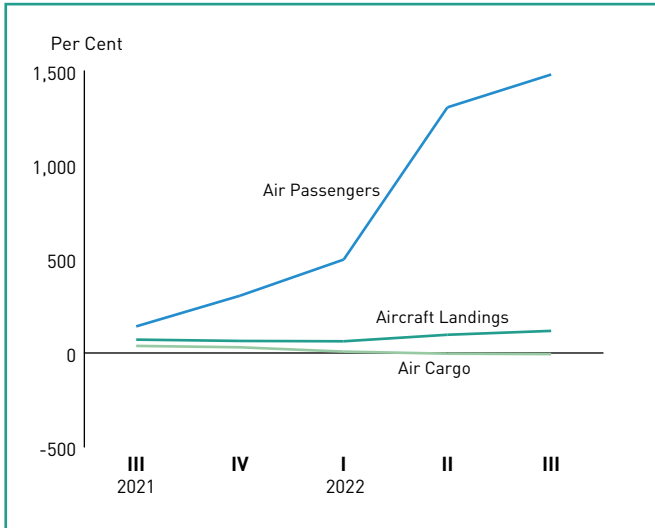
ACCOMMODATION

The accommodation sector shrank by 1.9 per cent year-on-year in the third quarter of 2022, moderating from the 3.4 per cent contraction in the preceding quarter. The sector's poor performance was due to a sharp decline in government demand for hotel rooms to serve as quarantine and Stay-Home-Notice dedicated facilities, arising from a shift towards home recovery and the relaxation of travel restrictions.

In the third quarter, total visitor arrivals surged by 4,089 per cent year-on-year, extending the 2,417 per cent growth in the second quarter (Exhibit 2.8). The strong growth in both quarters was on account of low base effects. In level terms, the number of visitor arrivals in the third quarter of 2022 was around 2.2 million, representing just 44.7 per cent of the 5.0 million visitor arrivals recorded in the third quarter of 2019 (i.e., pre-COVID level).

Exhibit 2.8: Visitor Arrivals
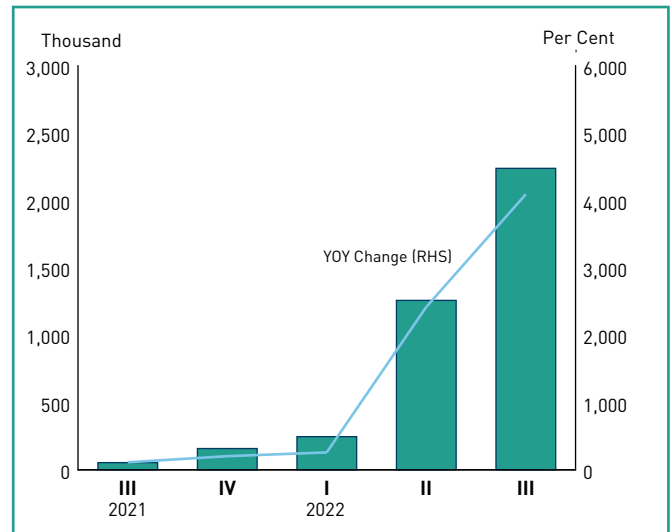
Reflecting the recovery in visitor arrivals, gross lettings at gazetted hotels climbed by 173 per cent year-on-year in the third quarter, accelerating from the 115 per cent increase in the previous quarter (Exhibit 2.9). At the same time, the average occupancy rate of gazetted hotels rose by 21.5 percentage-points year-on-year to reach 80.1 per cent in the third quarter. This was higher than the occupancy rate of 72.9 per cent recorded in the second quarter.

Exhibit 2.9: Gross Lettings at Gazetted Hotels
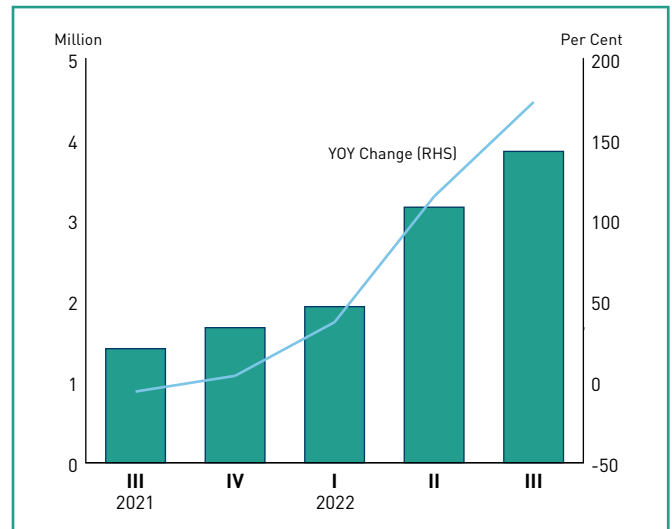
FOOD & BEVERAGE SERVICES

The food & beverage services sector expanded robustly by 30.5 per cent year-on-year in the third quarter of 2022, accelerating from the 23.4 per cent growth in the previous quarter.

Overall food & beverage sales volume rose by 28.2 per cent year-on-year in the third quarter, similar to the 28.0 per cent growth in the second quarter (Exhibit 2.10). The strong pickup in sales volume during the quarter came on the back of a low base, as sales volume was weighed down by the implementation of HA measures a year ago. The increase in food & beverage sales volume was broad-based, led by the food caterers (117 per cent) and restaurants (49.8 per cent) segments, while cafes, food courts & other eating places (13.5 per cent) and fast food outlets (9.3 per cent) saw relatively more modest growth in their respective sales volumes.

Exhibit 2.10: Changes in Food & Beverage Services Index in Chained Volume Terms
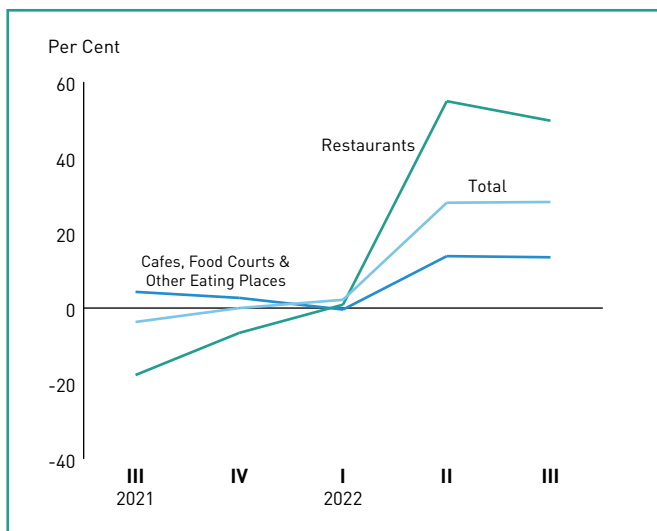
FINANCE & INSURANCE

The finance & insurance sector grew at a slower pace of 0.4 per cent year-on-year in the third quarter of 2022, compared to the 2.4 per cent expansion in the preceding quarter. Growth was largely supported by the other auxiliary activities segment (comprising mainly payments processing players), which continued to benefit from the cyclical uptick in cross-border payments with the recovery in tourism flows and ongoing structural shift towards e-payments.

In comparison, the banking segment contracted as net fees & commissions were weighed down by lower brokerage and investment banking revenues. Lending activity also weakened against the backdrop of slower economic growth. Loans to non-residents grew marginally by 0.5 per cent, dragged down by a contraction in lending to East Asia (Exhibit 2.11). Meanwhile, loans to residents expanded by 4.4 per cent, led by non-bank financial institutions and the manufacturing sector (Exhibit 2.12).

Meanwhile, the insurance segment shrank as sales of single-premium life insurance products dipped in view of stiffer competition from rising deposit rates. Similarly, sentiment-sensitive segments such as fund management and security dealing activities contracted as global equities continued to underperform in recent months.

Exhibit 2.11: Growth of Bank Loans & Advances to Non-Bank Non-Residents by Region in 3Q 2022
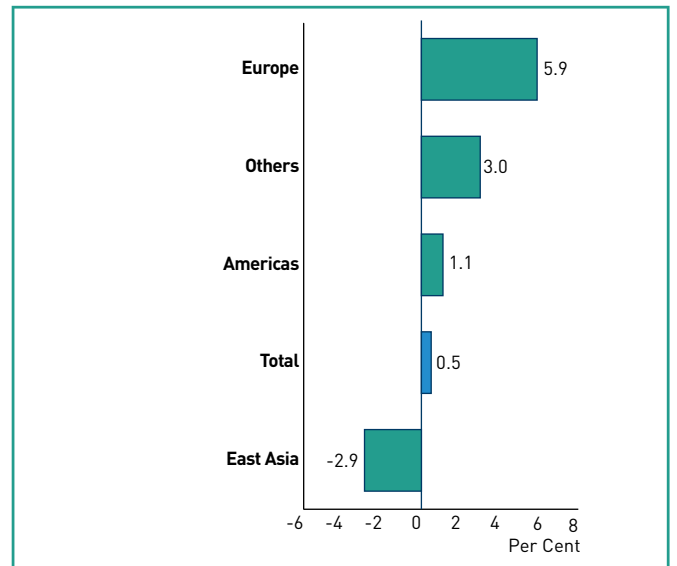
Exhibit 2.12: Growth of Bank Loans & Advances to Non-Bank Residents by Industry in 3Q 2022
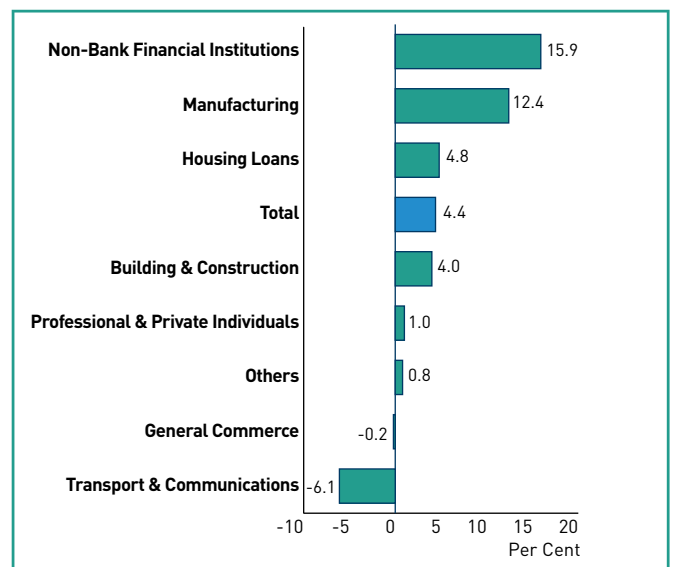
REAL ESTATE

The real estate sector expanded by 11.7 per cent year-on-year in the third quarter of 2022, extending the 11.1 per cent growth in the preceding quarter. The growth of the sector could be attributed to the private residential property segment, as well as the commercial office and industrial property segments. In particular, prices of private residential properties rose by 13.6 per cent year-on-year. Meanwhile, the rentals of commercial office and industrial space saw an increase of 7.2 per cent and 4.9 per cent year-on-year respectively.

Within the sector, the number of private residential property sales transactions fell by 9.7 per cent on a quarter-on-quarter basis in the third quarter, a sharp reversal from the 27.5 per cent increase in the previous quarter. Meanwhile, private residential property pric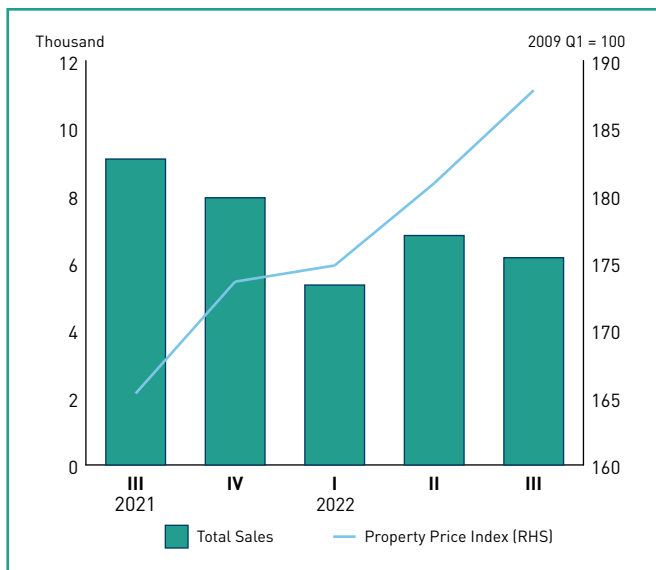es rose by 3.8 per cent on a quarter-on-quarter basis, extending the 3.5 per cent increase seen in the second quarter (Exhibit 2.13).

Exhibit 2.13: Total Sales Transactions for Private Residential Units and Private Residential Property Price Index

Conditions in the commercial and industrial property space markets were mixed. For the private retail space market, rentals edged down by 0.4 per cent on a quarter-on-quarter basis in the third quarter, extending the 0.5 per cent decline in the previous quarter (Exhibit 2.14). The average occupancy rate of private retail space came in at 91.3 per cent during the quarter, higher than the 90.6 per cent registered in the preceding quarter.

By contrast, rentals for private office space rose by 2.1 per cent on a quarter-on-quarter basis in the third quarter, extending the 2.4 per cent increase in the preceding quarter. The average occupancy rate of private office space rose to 87.4 per cent, from the 87.1 per cent recorded in the preceding quarter.

Exhibit 2.14: Changes in Rentals of Private Sector Office and Retail Spaces
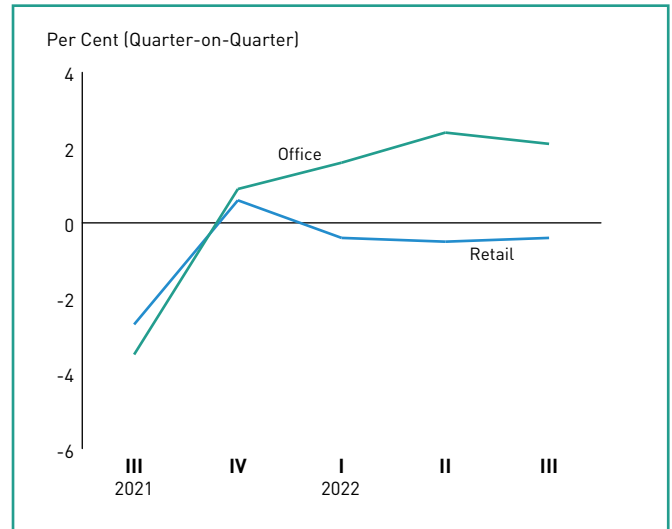
Similarly, private industrial rentals rose by 2.1 per cent on a quarter-on-quarter basis in the third quarter, following the 1.5 per cent increase in the preceding quarter. The occupancy rates of private sector multiple-user factory and warehouse spaces stood at 93.1 per cent and 91.4 per cent respectively, similar to that seen in the previous quarter (93.2 per cent and 91.4 per cent respectively) (Exhibit 2.15).

Exhibit 2.15: Occupancy Rate and Rental Growth of Private Sector Industrial Space
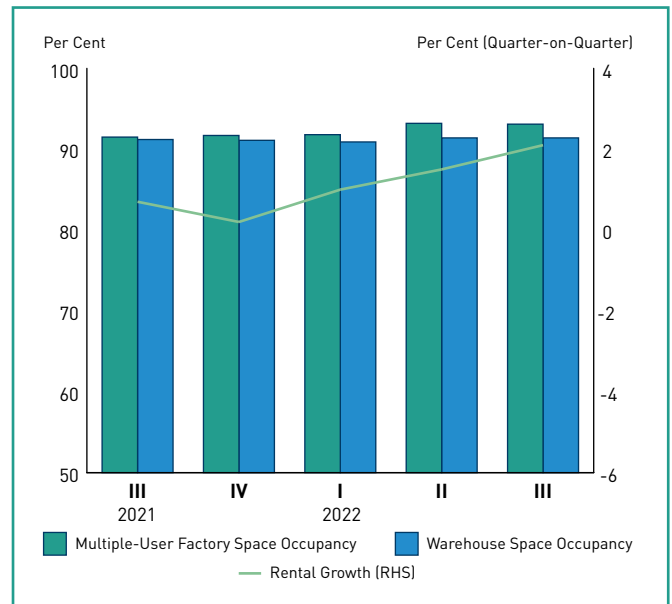
PROFESSIONAL SERVICES

In the third quarter of 2022, the professional services sector grew by 8.3 per cent year-on-year, similar to the 8.2 per cent growth in the previous quarter. Growth of the sector was mainly driven by expansions in the architectural & engineering, technical testing & analysis and the other professional, scientific & technical services segments, which outweighed a contraction in the legal segment.

ECONOMIC OUTLOOK

ECONOMIC OUTLOOK

LEADING INDICATORS

On a quarter-on-quarter basis, the composite leading index (CLI) declined by 1.0 per cent in the third quarter of 2022, a reversal from the 0.3 per cent increase in the previous quarter (Exhibit 3.1).

Of the nine components of the CLI, six components fell on a quarter-on-quarter basis, namely new companies formed, stock price, money supply, stock of finished goods, US Purchasing Managers' Index and wholesale trade. By contrast, domestic liquidity and non-oil retained imports increased, while non-oil sea cargo handled remained unchanged from the previous quarter.

Exhibit 3.1: Composite Leading Index Levels and Growth Rate

OUTLOOK FOR 2022

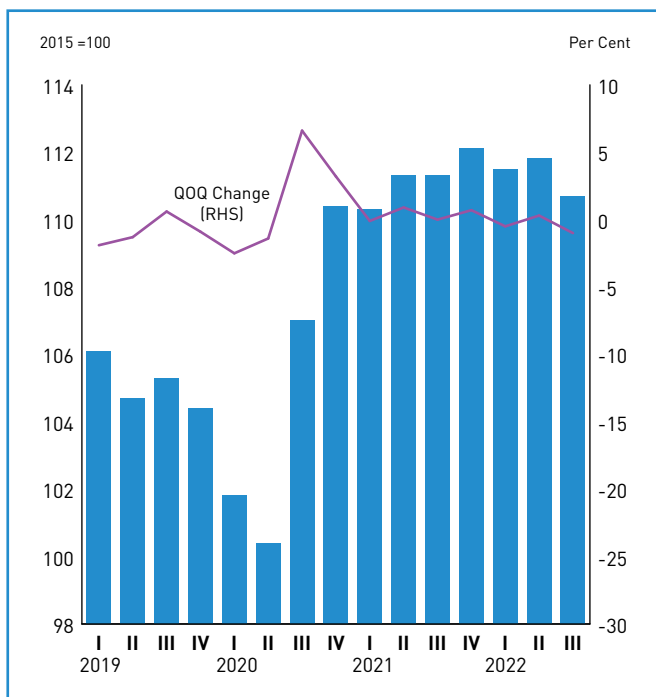Since the Economic Survey of Singapore in August, Singapore's external demand outlook has softened further due to the weaker outlook for the Eurozone economy amidst an energy crunch, as well as for China as it continues to grapple with recurring COVID-19 outbreaks and a property market downturn.

For the rest of the year, the weaker external economic outlook will weigh on the growth of outward-oriented sectors in Singapore, including the electronics and chemicals clusters. On the other hand, the strong recovery in air travel and international visitor arrivals is expected to continue to benefit aviation- and tourism-related sectors such as air transport and arts, entertainment & recreation, as well as consumer-facing sectors like food & beverage services. The lifting of travel restrictions in Singapore and the region has also boosted the recovery of the professional services sector.

Taking into account the performance of the Singapore economy in the first three quarters of the year (i.e., 4.2 per cent year-on-year), as well as the latest external and domestic developments, the 2022 GDP growth forecast for Singapore is narrowed to **"around 3.5 per cent"**, from "3.0 to 4.0 per cent".

OUTLOOK FOR 2023

Looking ahead to 2023, GDP growth rates in most major economies are expected to moderate further from 2022 levels, with sharp slowdowns projected in the US and Eurozone. Meanwhile, global supply disruptions are likely to continue into 2023 as the war in Ukraine drags on, even though the extent and frequency of disruptions is expected to ease.

In the US, GDP growth is projected to slow significantly, as tighter financial conditions, a reduction in household savings, and negative household wealth effects arising from asset market corrections are expected to weigh on private consumption. Similarly, GDP growth in the Eurozone is forecast to slow sharply. In particular, higher cost pressures arising from significant energy disruptions due to the Russia-Ukraine war, alongside tighter financial conditions, are likely to dampen consumption and industrial production.

In Asia, China's growth is projected to pick up from a low base but remain sluggish as its zero-COVID policy is likely to continue to constrain household consumption. Furthermore, while the financing measures introduced recently will help to alleviate the liquidity crunch faced by developers, the property sector is likely to remain weak in the near term. Meanwhile, GDP growth in the Southeast Asian economies of Malaysia and Indonesia is expected to moderate amidst weaker demand for their merchandise exports, although the ongoing recovery in domestic and tourism demand will provide some support.

At the same time, significant uncertainties and downside risks in the global economy remain. First, with many advanced economies raising interest rates simultaneously to combat high inflation, the impact of tightening financial conditions on global growth could be larger than expected. Second, financial stability risks could intensify if there are disorderly market adjustments to monetary policy tightening in the advanced economies. A sharp re-pricing of assets could trigger capital outflows from the region and increase debt servicing burdens, thereby dampening regional economies' growth outlook. Third, further escalations in the war in Ukraine and geopolitical tensions among major global powers could worsen supply disruptions, dampen consumer and business confidence, as well as weigh on global trade.

Against this backdrop, the growth of outward-oriented sectors in Singapore is expected to weaken in tandem with the deterioration in external demand conditions. For instance, the semiconductors segment of the electronics cluster is expected to be negatively affected by the fall in global demand for semiconductors, while the machinery & systems segment of the precision engineering cluster is projected to be weighed down by a cutback in capital spending by semiconductor manufacturers amidst weak demand. At the same time, growth in the wholesale trade, water transport and finance & insurance sectors is expected to be dampened by the slowdown in major external economies.

On the other hand, the growth prospects of several sectors remain positive. In particular, the continued recovery in air travel and international visitor arrivals will support the expansion of aviation- and tourism-related sectors like air transport, accommodation and arts, entertainment & recreation, as well as other related activities. The latter include the rental & leasing of air transport equipment within the administrative & support services sector, and aircraft engine maintenance and repair work for the aerospace segment within the transport engineering cluster.

Taking these factors into account, and barring the materialisation of downside risks, the Singapore economy is expected to grow by **"0.5 to 2.5 per cent"** in 2023.
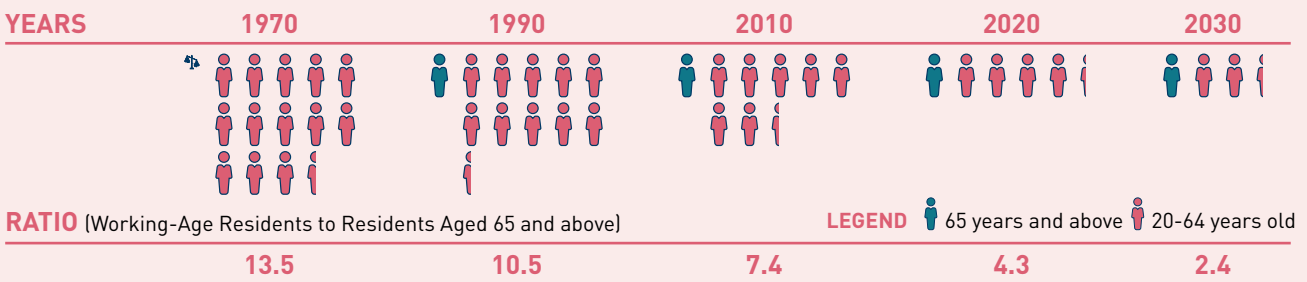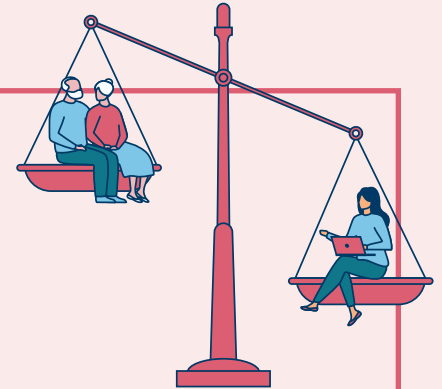
FEATURE ARTICLE

CHANNELS AFFECTING THE LABOUR MARKET OUTCOMES OF OLDER RESIDENT WORKERS

CHANNELS AFFECTING THE LABOUR MARKET OUTCOMES OF OLDER RESIDENT WORKERS

INTRODUCTION

Singapore's resident population is rapidly ageing, with the number of working-age residents (20-64 years old) relative to residents aged 65 & above expected to decrease from 4.3 in 2020 to 2.4 in 2030.

Using longitudinal data from the Retirement and Health Study (RHS), this study examines the effects of ageing on labour market outcomes and the channels, such as human capital accumulation, health conditions and preferences for retirement, through which these effects occur.

YEARS	1970	1990	2010	2020	2030

RATIO (Working-Age Residents to Residents Aged 65 and above)

LEGEND 🧍 65 years and above 🧍 20-64 years old

	1970	1990	2010	2020	2030
	13.5	10.5	7.4	4.3	2.4

Source: Singapore Department of Statistics

FINDINGS

Four channels by which ageing affects labour market outcomes

- **Human Capital**
- **Health**
- **Preferences for Retirement**
- **Job Characteristics**

The study finds that:

- Older workers are likely to accumulate human capital as they age, which in turn enables them to command higher hourly wages, especially if they stay within the same firm.

- A deterioration in health conditions can negatively affect older workers' ability to remain in employment, as well as to maintain their wage levels, likely reflecting a reduction in productivity at work.

- Transitioning into partial retirement, the availability of flexible work arrangements, or having the option to work as own-account workers or employers, can potentially allow older workers to flexibly adjust their hours worked without a decline in hourly wages.

- There is some evidence that the re-employment age has been effective in encouraging older workers to continue working beyond the retirement age.

POLICY TAKEAWAY

Policies that help older workers to stay in employment including training and upskilling programmes, provision of flexible work arrangements, and the use of re-employment age are likely to help support the labour market outcomes of older workers. Policymakers should continue to design inclusive and supportive policies that help older workers to continue to work if they are able and willing to.

EXECUTIVE SUMMARY

▸ Singapore's population is ageing rapidly. Understanding the effects of ageing on individuals' labour market outcomes, as well as the channels through which these effects occur, can help policymakers to design more effective policies to support older workers as they age. The key channels examined in this study are human capital accumulation, health conditions and preferences for retirement. The study also examines how job characteristics can help to mediate the effects of ageing on labour market outcomes.

▸ The key findings of the study are as follows. First, older workers are likely to accumulate human capital as they age, which in turn enables them to command higher hourly wages, especially if they stay within the same firm. Second, a deterioration in health conditions can negatively affect older workers' ability to remain in employment, as well as to maintain their wage levels, likely reflecting a reduction in productivity at work. Third, transitioning into partial retirement, the availability of flexible work arrangements, or having the option to work as own-account workers or employers, can potentially allow older workers to flexibly adjust their hours worked without a decline in hourly wages. Finally, there is some evidence that the re-employment age has been effective in encouraging older workers to continue to work until 67.

The views expressed in this paper are solely those of the author and do not necessarily reflect those of the Ministry of Trade and Industry (MTI) or the Government of Singapore.[1]

INTRODUCTION

Singapore's population is rapidly ageing. By 2030, one in four Singaporeans will be aged 65 and older, from one in six in 2020 and one in eight in 2015 (Department of Statistics, 2022). This could result in a heavier economic burden on a smaller base of working-age residents (MTI, 2007). Improving the labour market outcomes (e.g., employment rates, wages) of older Singaporeans and extending their working lives have therefore become increasingly important. A deeper understanding of the effects of ageing on labour market outcomes, and the channels through which these effects occur, can contribute to the design of effective policies aimed at supporting older workers as they age.

This paper is organised as follows. The first section presents a brief literature review on the channels through which ageing may affect labour market outcomes. The second section examines the data and presents summary statistics. The third section describes the empirical strategy used to estimate the effects of ageing through the various channels identified. The fourth section presents the empirical results, while the last section concludes.

LITERATURE REVIEW

From the literature, there are four main channels through which ageing can influence individuals' labour market outcomes.

First, ageing can be accompanied by **human capital** accumulation through training or experience gained from work, with those who remain with the same employer also developing firm-specific human capital. Such human capital accumulation will help to raise older workers' productivity (Becker, 1962). However, there may also be countervailing forces that weigh on human capital accumulation as individuals age. For instance, as individuals age, they may face greater risks of skills obsolescence (de Grip & van Loo, 2002). Older individuals may also choose to reduce their investment in human capital development since there is a shorter runway to benefit from these investments. Models that ascribe to these forces (e.g., Ben-Porath, 1967) generally predict a decline in employment rates and wages due to human capital depreciation as individuals age. While the theoretical effect of ageing on human capital is ambiguous, more recent empirical studies[2] utilising longitudinal microdata suggest that individuals do not experience wage declines as they age. Some studies (e.g., Casanova, 2013) found increases in hourly earnings instead.

<u>Second</u>, ageing may coincide with a deterioration in **health** through increased risks of illnesses, as well as lower levels of strength, energy, psychomotor abilities and dexterity (Skirbekk, 2008). These could in turn lead to a decline in productivity, and hence, the employment rates and wages of older workers.

<u>Third</u>, older workers may exhibit increased **preferences for retirement**. Their retirement decision could be influenced by the statutory retirement or re-employment age, which set a social norm around when individuals should retire (Lee, Huang & Guo, 2017). On the other hand, instead of completely stopping work, older workers may choose to reduce their work intensity. This can be manifested through partial retirement, where workers take on roles with reduced responsibilities and hours worked (Siegenthaler & Brenner, 2001).

<u>Lastly</u>, the effect of ageing on labour market outcomes can be mediated by **job characteristics** such as the types of employment that an individual is in (e.g., employee, employer, own-account worker). Job characteristics can also interact with the first three channels above. For example, access to flexible work arrangements[3] (FWAs) may help to meet older workers' preferences to work at a reduced intensity while supporting their continued participation in the labour force (Vanajan, Bültmann & Henkens, 2020).

DATA AND SUMMARY STATISTICS

This study uses data from the Retirement and Health Study (RHS), a biennial longitudinal survey on the retirement and healthcare needs of Singapore residents aged 45 and above. In order to examine the changes in labour market outcomes as individuals age, the RHS sample used for the study focuses on main survey respondents who had participated in at least two survey waves and were working in their first participated wave.

Across the three waves between 2014 and 2018, the RHS surveyed 16,400 unique individuals, with 13,700 respondents participating in at least two survey waves. Of the repeat respondents, 9,400 were working in their first participated wave. Most of the respondents in the study's sample are male, non-PMET[4], and work as employees (Exhibit 1).

Exhibit 1: Means (Standard Deviations in Parentheses) of Key Characteristics of RHS Respondents

		Full RHS sample	Sample used: Repeat respondents who were working in their first participated wave		
			All	Working in subsequent wave(s)	Not working in subsequent wave(s)
Age		62.2 (10.2)	58.1 (8.2)	57.5 (7.8)	64.5 (9.0)
Female		0.52 (0.50)	0.41 (0.49)	0.41 (0.49)	0.44 (0.50)
PMET		0.19 (0.40)	0.33 (0.47)	0.36 (0.48)	n.a
Education	Secondary or Below Post Secondary Diploma or Degree	0.43 (0.50) 0.38 (0.48) 0.19 (0.39)	0.34 (0.47) 0.41 (0.49) 0.25 (0.44)	0.32 (0.47) 0.41 (0.49) 0.26 (0.44)	0.49 (0.50) 0.34 (0.47) 0.17 (0.38)
Employee Status	Employee Own Account Worker Employer Contributing Family Worker	0.82 (0.38) 0.13 (0.33) 0.04 (0.19) 0.01 (0.10)	0.82 (0.38) 0.13 (0.33) 0.04 (0.20) 0.01 (0.10)	0.82 (0.38) 0.13 (0.33) 0.04 (0.20) 0.01 (0.10)	n.a
Count (unique individuals)		16,428	9,419	9,419	1,579

Source: Author's calculations, based on data from the RHS.
Note: Proportions of factor variables may not sum to 1 due to rounding. In the RHS, employers are defined as persons who employ at least one paid worker in their business or trade, while own account workers are engaged in a trade without employing any paid workers (e.g., piano teachers or platform workers). Characteristics in the table are reported for each unique individual. For characteristics which differ across waves, mode is taken (earlier wave is taken in the event of a tie).

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3   *FWAs encompass a range of working arrangements offered by employers that differ from traditional arrangements of fixed daily work hours at the workplace. In Singapore, the more common types of FWAs are tele-working, staggered hours, and home working (MOM, 2022b).*
4   *PMET refers to professional, managerial, executive and technical occupations.*

Using data from the RHS sample, four labour market outcomes are constructed:

- <u>Probability of employment</u> (or extensive margin) – this is reported by the respondent in each survey wave.

- <u>Monthly real wages</u>[5] – this is reported by respondents who were still working. Commensurate with the broad definition of employment, wages include salary and all other forms of income from work.[6]

- <u>Monthly hours worked</u> – this is derived from working respondents' responses on how many hours they usually worked per week. Specifically, the reported data is scaled to the number of hours worked per month and converted to actual hours worked by accounting for sick leave, public holidays and annual leave.

- <u>Hourly real wages</u> – this is obtained by dividing monthly real wages by monthly hours worked.

Summary statistics on the constructed employment, wage and hours worked outcome variables are presented on a pooled-cross sectional basis in Exhibit 2. Older RHS respondents had a lower probability of being employed, with most non-employed respondents being out of the labour force rather than being unemployed (Exhibit 2, Panel A). Older respondents were also more likely to be in partial retirement. Finally, older respondents tended to have lower monthly wages due to the joint effects of reduced hours worked and reduced hourly wages (Exhibit 2, Panel B).[7]

Exhibit 2: Key Employment and Wage Variables of RHS Respondents in the Sample

Panel A: Employment Statuses Among All RHS Respondents in the Sample

Age category	Observations	Working	Unemployed	Out of the Labour Force	Partial Retirement
45 - 54	8,987	0.96 (0.20)	0.02 (0.13)	0.02 (0.15)	0.04 (0.20)
55 - 64	8,930	0.93 (0.26)	0.02 (0.13)	0.06 (0.23)	0.13 (0.34)
65 - 74	3,940	0.82 (0.39)	0.02 (0.15)	0.16 (0.37)	0.29 (0.45)
75 - 90	963	0.69 (0.46)	0.02 (0.14)	0.30 (0.46)	0.28 (0.45)
Total	**22,820**	**0.91 (0.28)**	**0.02 (0.13)**	**0.07 (0.26)**	**0.13 (0.34)**

Note: Cells capture the means (standard deviations in parentheses) on a pooled-cross sectional basis. Respondents are classified as working, unemployed, or out of the labour force; those in partial retirement are a subset of those who are working. Numbers across the working, unemployed and out of the labour force categories may not sum to 1 due to rounding. The unemployed column represents the percentage of RHS respondents in the sample who are unemployed, which is different from the unemployment rate, where the denominator is the size of the labour force.

Panel B: Monthly Real Wages, Hours Worked, and Hourly Real Wages Among Working RHS Respondents

Age category	Observations	Monthly Real Wages	Monthly Hours Worked	Hourly Real Wages
45 - 54	8,630	5,131 (3,315)	178.2 (170.4)	31.20 (34.90)
55 - 64	8,277	3,925 (4,718)	172.4 (169.8)	24.90 (31.40)
65 - 74	3,221	2,565 (3,761)	157.8 (165.5)	18.80 (28.50)
75 - 90	660	1,174 (2,390)	143.2 (157.8)	16.70 (26.20)
Total	**20,788**	**4,147 (4,937)**	**171.7 (65.3)**	**26.30 (32.70)**

Note: Cells capture the means (standard deviations in parentheses) on a pooled-cross sectional basis. Monthly and hourly wages are in constant (2019) prices.

5   This variable was adjusted to 2019 dollars using the Consumer Price Index (CPI) for All Items, winsorised at the 1st and 99th percentiles, and computed at an annual (latest 12 months) basis before being converted to a monthly basis.

6   Specifically, these include overtime pay, commissions, tips, bonuses, allowances, CPF contributions, royalties, honorariums and director fees, all of which are collected in the RHS. For non-employees, business profits (i.e., net earnings) are reported.

7   This is similar to findings from MOM's Labour Force Survey which showed a hump-shaped wage-age curve with median wages peaking at ages 40-44 (MOM, 2022a).

EMPIRICAL STRATEGY

The main regression specification used to identify the effect of ageing on individuals' labour market outcomes is the individual fixed-effects model. This model estimates the effect of ageing by examining changes in each individual's labour market outcomes as he/she ages (i.e., within each individual).

Doing so helps to remove birth cohort effects that would confound analyses using pooled-cross sectional data.[8] For example, if later birth cohorts had experienced improvements in the quality of schooling and hence earned higher wages, comparing older cohorts to younger cohorts would lead to a downward bias in the effect of ageing on wages. Furthermore, the fixed-effects model is able to account for not just individual characteristics that are observed (e.g., highest education received, gender) but also those that are unobserved and time-invariant (e.g., innate ability).

Specifically, the baseline fixed-effects regression model used for the study is as follows:

$$log\ Y_{it} = \beta_1\ age_{it} + \beta_2\ X_{it} + \theta_i + \varepsilon_{it} \qquad (1)$$

Where:

- Y_{it} represents labour market outcomes (e.g., probability of employment, monthly real wages, monthly hours worked and hourly real wages) for individual i in year t. For employment, a binary outcome indicator was used;
- age_{it} is the age of individual i at the point of the RHS interview in year t;
- X_{it} is a vector of variables that include tenure within the same firm, self-reported health and partial retirement (whether voluntary and involuntary);
- θ_i represents individual fixed-effects;
- β_1 measures the average[9] impact of an increase in one year of age on individual-level labour market outcomes.[10] Since the probability of employment is a binary variable, the coefficient for that regression should be interpreted as a percentage-point impact;
- ε_{it} is the error term.

β_1 is the key coefficient of interest as it measures the effect of ageing on labour market outcomes. As health and partial retirement statuses are included as regressors, β_1 would reflect the effect of general human capital accumulation with age. Tenure, which is a regressor in X_{it}, would capture the firm-specific component of human capital accumulation. The coefficients for the health and partial retirement variables are also examined for their separate effects on individuals' labour market outcomes.

To explore how job characteristics interact with the channels identified (i.e., human capital, health and preferences for retirement), interaction terms are added to the age term in regression model (1). The regression model with the interaction terms is as follows:

$$log\ Y_{it} = \sum_j \beta_j\ age_{it} \times Z_i + \beta_2\ X_{it} + \theta_i + \varepsilon_{it} \qquad (2)$$

Where:

- Z_i is a vector of the four employment types (i.e., employee, employer, own account worker, contributing family worker), as identified in the first wave of survey participation;
- β_j is a vector of coefficients measuring the age effect of each type of employment; and
- All other variables are as defined in model (1)

Other regressors, such as a binary variable on the availability of FWAs[11] and dummy variables for age cutoffs at the statutory retirement age (62) and re-employment age (67), are subsequently added to regression model (1) to examine how such policies affect individuals' labour market outcomes.

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8   It should be noted that while the age effect can be separated from the cohort effect, there remains a period effect that cannot be separated from the age effect. For example, a macroeconomic downturn which coincides with the period of study can overstate the negative effect of ageing. Nevertheless, this is less of a concern for this study as the period of study (i.e., 2014 to 2018) represented a relatively stable economic period for Singapore. See Bell and Jones (2013) for a more detailed discussion on identification challenges.

9   Since the outcome variables for wages are in logarithms, the coefficient of interest β_1 is approximately equal to the percentage change in the outcome variable (i.e., $100*(e^{\beta_1} - 1)$) for small values of β_1.

10 The effect of age on wages may be non-linear in nature. For instance, Murphy & Welch (1990) showed that expanding the Mincer regression specification to contain the third or fourth order polynomials for experience (age) leads to improvements in fit. After testing for non-linearity with non-parametric and polynomial (of up to the fourth-power) terms for age, the linear fixed-effects model was found to be a good fit for the earnings profile in the RHS sample used.

11 The FWA variable is a binary variable capturing whether an individual agreed or strongly agreed to the proposition that his/her workplace offered "flexible work arrangements, reduced work hours or flexible hours of work".

RESULTS

Exhibit 3 below presents the results from the baseline specification, i.e., regression model (1). The key findings are as follows. <u>First</u>, each year of ageing is associated with a 4.7 percentage-point (pp) decline in the probability of employment.

<u>Second</u>, on the intensive margin (i.e., conditional on employment), individuals experienced an increase in monthly real wages (0.8 per cent) as they aged by a year due to a rise in hourly real wages (1.7 per cent), which more than offset a decline in hours worked (-0.9 per cent). The slight reduction in work intensity (i.e., hours worked) could be due to individuals' preferences as some of them approach retirement age. As the wage outcomes are conditional on employment, these findings suggest that older workers accumulate human capital as they work, which then translates to real wage growth. Apart from general human capital accumulation, the results also show that each additional year of tenure within the same firm is associated with increased monthly real wages (0.7 per cent) and hourly real wages (0.5 per cent), potentially reflecting firm-specific human capital accumulation.

<u>Third</u>, poorer self-reported health is correlated with a decline in employment probability (-2.2 pp) as well as hourly real wages (-2.5 per cent). These findings are robust to using other health indicators from the RHS survey,[12] and suggest that health is an important factor that determines whether individuals are productive at work.

<u>Fourth</u>, transitioning into partial retirement is associated with a decline in monthly real wages, driven by a fall in the number of hours worked. These estimates are similar regardless of whether individuals entered partial retirement voluntarily or non-voluntarily.

Exhibit 3: Regression Results for the Effect of Ageing on Labour Market Outcomes, with Controls for Tenure, Health, and Partial Retirement

		Employment	Log (Monthly Real Wages)	Log (Hours Worked)	Log (Hourly Real Wages)
Individual Fixed-effects **[Model 1]**	**Age**	-0.047 ***	0.008 ***	-0.009 ***	0.017 ***
	Tenure	n.a	0.007 ***	0.003 ***	0.005 ***
	Poor Health	-0.022 ***	-0.015	0.011	-0.025 *
	Voluntary Partial Retirement	n.a	-0.155 ***	-0.168 ***	0.013
	Non-voluntary Partial Retirement	n.a	-0.198 ***	-0.161 ***	-0.037

Statistical significance: *** p<0.01, ** p<0.05, *p<0.10.

Delving deeper into the age effects by employment types, the results show that the hourly real wages of older workers in all employment types rose with age, although the coefficients for contributing family workers and employers were statistically insignificant (Exhibit 4, Panel A). At the same time, employers and own account workers were most able to reduce their working hours. Likewise, the availability of FWAs allowed older workers to reduce their work hours (-3.7 per cent) without a fall in hourly real wages (Exhibit 4, Panel B). This suggests that FWAs could play an important role in supporting the continued employment of older workers by accommodating their preferences for reduced work hours.

Finally, in terms of how the retirement age and the re-employment age can influence individuals' labour market outcomes (Exhibit 4, Panel C), the estimates show that reaching the retirement age of 62 is associated with a discontinuous fall in monthly (-4.0 per cent) and hourly (-3.4 per cent) real wages, without any statistically significant impact on the probability of employment. This could reflect a step-down in job responsibilities taken on by individuals upon reaching retirement age. By contrast, reaching the re-employment age of 67 is associated with a decline in employment probability (-11.0 pp). These results suggest that the re-employment age has been effective in encouraging older workers to work until 67, possibly by setting a social norm around when individuals should retire (Lee, Huang & Guo, 2017).

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12   *Directionally similar estimates, though of larger magnitudes, were found using the incidence of cancer (excluding skin cancer) as opposed to self-reported health.*

Exhibit 4: Regression Results for Employment Types, Flexible Work Arrangements, and Reaching the Retirement Age and the Re-employment Age

		Employment	Log (Monthly Real Wages)	Log (Hours Worked)	Log (Hourly Real Wages)
Panel A					
Individual Fixed-effects **[Model 2]**	**Age × Employee**	-0.045 ***	0.010 ***	-0.005 **	0.015 ***
	Age × Own Account Worker	-0.033 ***	0.004	-0.029 ***	0.033 ***
	Age × Employer	-0.062 ***	-0.022 **	-0.037 ***	0.015
	Age × Contributing Family Worker	-0.081 ***	0.037 *	0.005	0.032
Panel B					
Fixed-effects	**Age**	-0.047 ***	0.008 ***	-0.009 ***	0.017 ***
	Flexible Work Arrangements	n.a.	-0.035 ***	-0.037 ***	0.003
Panel C					
Fixed-effects	**Age**	-0.044 ***	0.011 ***	-0.008 ***	0.019 ***
	I(Age ≥ 62)	-0.013	-0.040 **	-0.005	-0.034 *
	I(Age ≥ 67)	-0.110 ***	-0.034	-0.005	-0.029

Statistical significance: *** p<0.01, ** p<0.05, *p<0.10.

Note: For the employment outcome variable, health was added as a control in the regressions, while for wages and hours worked, health, partial retirement and tenure were added as controls.

CONCLUSION

This study examines the labour market outcomes of older workers as they age, and finds that while the probability of employment declined with age, hourly real wages continued to increase if they remained in employment, especially within the same firm. These findings suggest that policies that help workers to stay in employment, such as training and upskilling programmes, can allow both firms and workers to benefit from accumulated human capital.

As older workers may prefer to reduce their work intensity as they age, work arrangements that allow them to flexibly adjust their hours worked, such as FWAs, would also help to support their continued participation in the labour market. At the same time, the re-employment age has been found to be effective in encouraging older individuals to continue working beyond the retirement age. More broadly, to mitigate the impact of an ageing population, policymakers should continue to design inclusive and supportive policies that help older workers to continue to work if they are able and willing to.

Contributed by:

Mr Chuck Chua
Economist
Economics Division
Ministry of Trade and Industry

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