ECONOMIC SURVEY OF SINGAPORE

Third Quarter 2020

MTI MINISTRY OF TRADE AND INDUSTRY SINGAPORE

November 2020

Ministry of Trade and Industry
Republic of Singapore

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MAIN INDICATORS OF THE SINGAPORE ECONOMY

OVERALL ECONOMY

Real GDP (Year-on-Year Growth)

2Q20	3Q20
-13.3%	-5.8%

GDP at Current Market Prices

2Q20	3Q20
$103.2 billion	$114.7 billion

PRICES

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

2Q20	3Q20
-0.7%	-0.3%

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

2Q20	3Q20
-13.1%	-9.4%

LABOUR MARKET

Change in Employment (Quarter-on-Quarter)

2Q20	3Q20
-113.5 thousand	-32.1 thousand

Overall Unemployment Rate

2Q20	3Q20
2.8%	3.6%

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

2Q20	3Q20
+2.4%	+2.2%

COSTS

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

2Q20	3Q20
-18.9%	-10.1%

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

2Q20	3Q20
-23.4%	-21.8%

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

2Q20	3Q20
-37.0%	-27.4%

MERCHANDISE TRADE

Merchandise Exports

2Q20	3Q20
$113,624 million	$127,281 million
-14.0% Year-on-Year Growth	-5.0% Year-on-Year Growth

Merchandise Imports

2Q20	3Q20
$102,466 million	$113,126 million
-16.6% Year-on-Year Growth	-7.6% Year-on-Year Growth

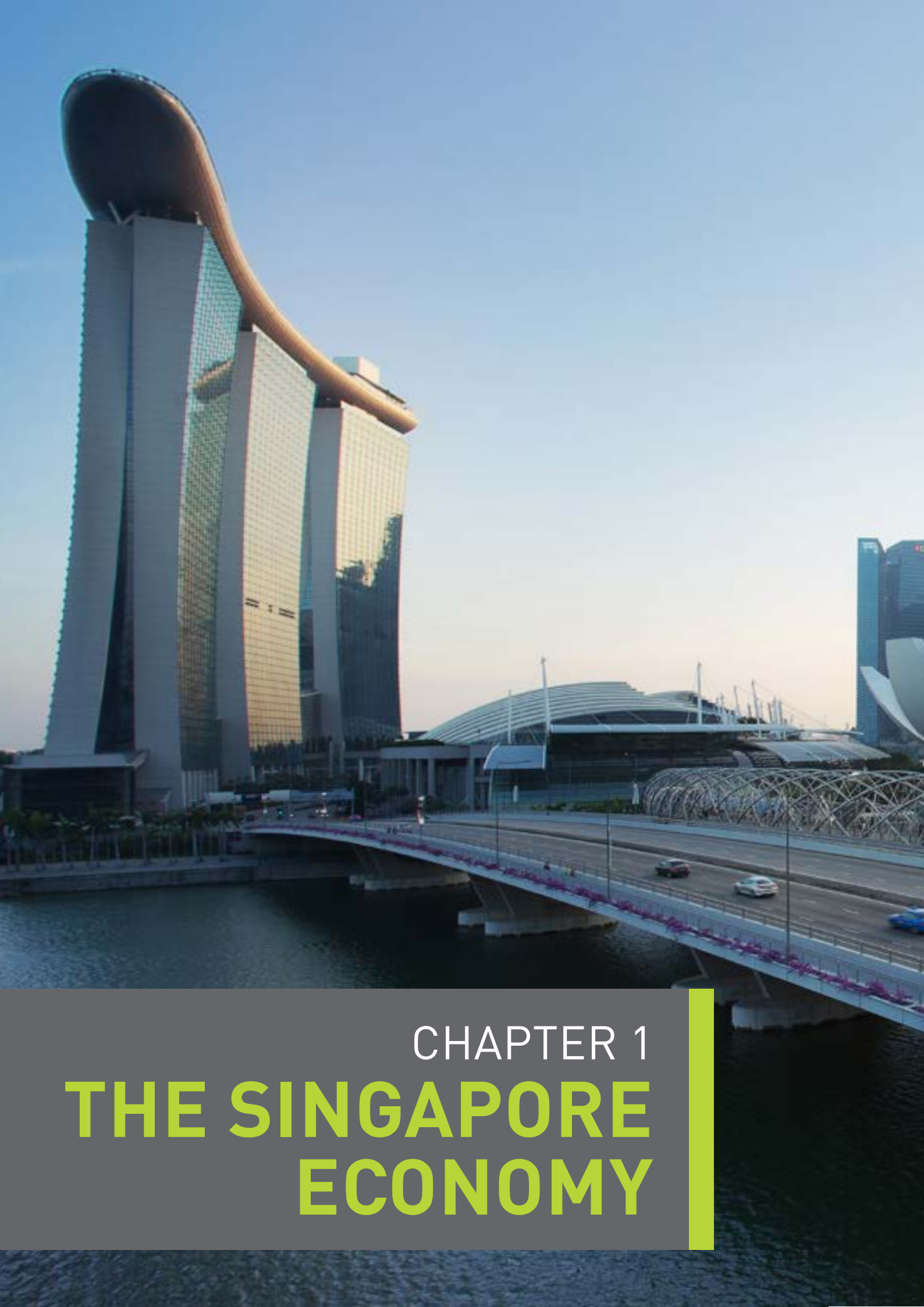
SERVICES TRADE

Services Exports

2Q20	3Q20
$55,048 million	$57,767 million
-20.8% Year-on-Year Growth	-17.8% Year-on-Year Growth

Services Imports

2Q20	3Q20
$51,602 million	$54,105 million
-24.1% Year-on-Year Growth	-19.2% Year-on-Year Growth



CHAPTER 1

THE SINGAPORE ECONOMY

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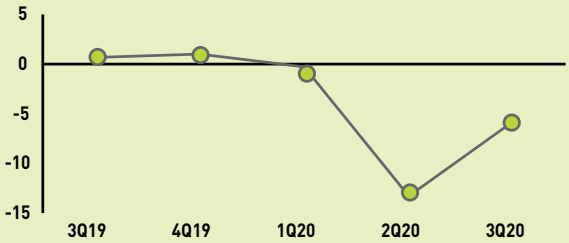
THE SINGAPORE ECONOMY

ECONOMIC PERFORMANCE

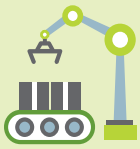
Real GDP declined by 5.8% in 3Q20

Quarterly Growth (Year-on-Year)



Main Drivers of Growth in 3Q20

Manufacturing



2.0%-point contribution

Finance & Insurance

0.4%-point contribution

LABOUR MARKET

Resident Unemployment Rate

4.7% in 3Q20

Employment (Q-O-Q Change)

-32,100 employed

PRODUCTIVITY

Value-Added per Actual Hour Worked increased by 2.2% in 3Q20

Sectors with the Highest Growth in Value-Added per Actual Hour Worked in 3Q20

22.3%

Manufacturing

3.3%

Wholesale & Retail Trade

COSTS

Overall Unit Labour Cost decreased by

10.1% in 3Q20

Within the manufacturing sector

-21.8%	-27.4%
	
Unit Business Cost	Unit Labour Cost

PRICES

The Consumer Price Index (CPI) declined by

0.3% in 3Q20

Categories with Price Decreases

-4.0%	-1.9%
	
Clothing & Footwear	Health Care

Quarterly Growth (Year-on-Year)

INTERNATIONAL TRADE

Total Merchandise Exports declined by 5.0% in 3Q20

6.5%	0.4%	-48.6%
		
Non-Oil Domestic Exports	Re-exports	Oil Domestic Exports

Total Services Exports declined by 17.8% in 3Q20

Services Export Decline was led by...

-8.5%-pt	-4.9%-pt
	
Travel	Transport Services

OVERVIEW

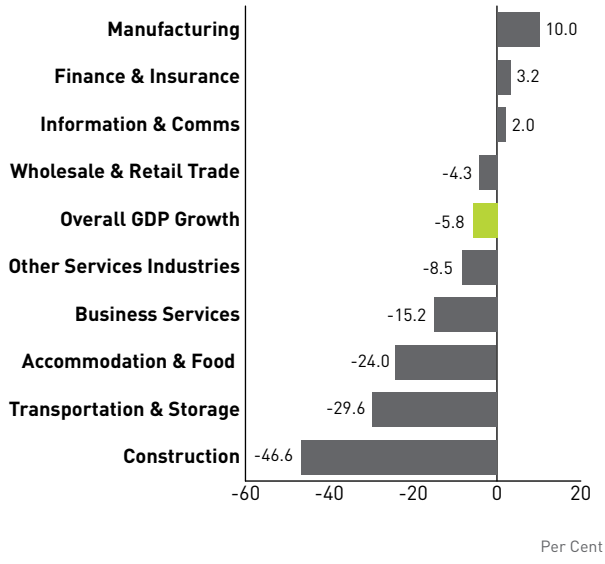
In the third quarter of 2020,

- The Singapore economy contracted by 5.8 per cent on a year-on-year basis. The sectors that contributed the most to the decline were business services, transportation & storage and construction.
- The seasonally-adjusted overall, resident and citizen unemployment rates rose in September 2020 as compared to June 2020. Retrenchments in the third quarter were slightly higher than that recorded in the preceding quarter, but remained lower than the peak during the Global Financial Crisis (GFC).
- Total employment fell by 32,100 on a quarter-on-quarter basis, moderating significantly from the contraction in the second quarter (-113,500), which was the largest quarterly decline on record. Excluding foreign domestic workers (FDWs), total employment contracted by 26,900, with the decline attributable to a continued fall in non-resident employment even as resident employment rebounded.
- The Consumer Price Index-All Items (CPI-All Items) dipped by 0.3 per cent on a year-on-year basis, easing from the 0.7 per cent decline in the second quarter.

OVERALL PERFORMANCE

The Singapore economy expanded by 9.2 per cent on a quarter-on-quarter seasonally-adjusted basis in the third quarter, a turnaround from the 13.2 per cent contraction in the second quarter. On a year-on-year basis, the economy contracted by 5.8 per cent, moderating from the 13.3 per cent contraction recorded in the previous quarter (Exhibit 1.1). The improved performance of the Singapore economy came on the back of the phased resumption of activities in the third quarter following the Circuit Breaker that was implemented from 7 April to 1 June 2020, as well as the rebound in activity in major economies during the quarter as they emerged from their lockdowns.

Exhibit 1.1: GDP and Sectoral Growth Rates in 3Q 2020



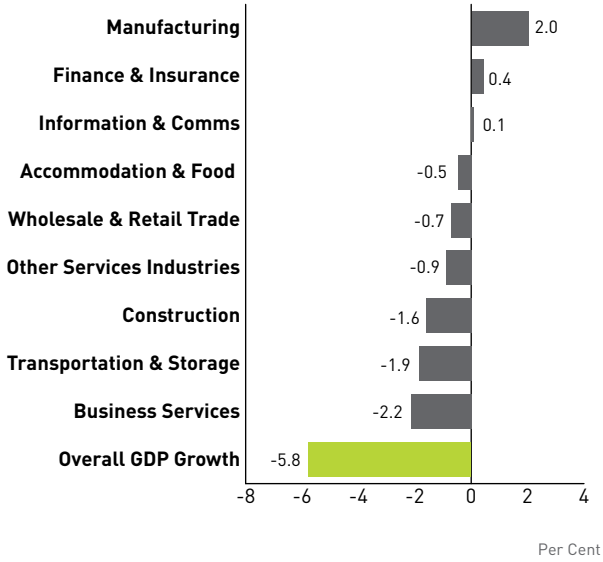
By sectors, the manufacturing sector expanded by 10 per cent year-on-year in the third quarter, reversing the 0.8 per cent decline in the previous quarter. The expansion was largely due to output growth in the electronics, biomedical manufacturing and precision engineering clusters, which more than offset output declines in the transport engineering and general manufacturing clusters. In particular, output increases in the electronics and precision engineering clusters were due to strong global demand for semiconductors and semiconductor equipment respectively.

The services producing industries shrank by 8.4 per cent year-on-year in the third quarter, an improvement from the 13 per cent decline recorded in the previous quarter. All services sectors contracted, except for the finance & insurance and information & communications sectors, which grew by 3.2 per cent and 2.0 per cent year-on-year respectively. Among the services sectors that shrank, the transportation & storage (-30 per cent) and accommodation & food services (-24 per cent) sectors recorded the largest contractions.

The construction sector contracted by 47 per cent year-on-year in the third quarter, extending the 60 per cent contraction in the previous quarter. Construction output during the quarter remained weak due to the slow resumption of construction activities as construction firms had to implement safe management measures at the worksites for a safe restart.

The top three contributors to the GDP decline in the third quarter were the business services, transportation & storage and construction sectors (Exhibit 1.2).

Exhibit 1.2: Percentage-Point Contribution to Growth in Real GDP in 3Q 2020 (By Industry)



SOURCES OF GROWTH

Total demand declined by 8.0 per cent year-on-year in the third quarter, an improvement from the 16 per cent drop in the previous quarter (Exhibit 1.3). The improvement came on the back of the resumption of activities in Singapore following the Circuit Breaker as well as the rebound in activity in external economies that emerged from their lockdowns.

External demand fell by 6.9 per cent year-on-year in the third quarter, moderating from the 14 per cent decline in the previous quarter, as many major economies around the world continued to grapple with the COVID-19 pandemic.

Meanwhile, domestic demand decreased by 11 per cent year-on-year in the third quarter, better than 21 per cent contraction in the previous quarter, as private consumption expenditure and gross fixed capital formation (GFCF) remained weak.

Within domestic demand, GFCF shrank by 19 per cent year-on-year in the third quarter, extending the 25 per cent decline in the previous quarter. Overall GFCF was weighed down by a 15 per cent and 35 per cent drop in private sector and public sector GFCF respectively, both of which were largely due to lower investments in construction & works.

*Exhibit 1.3: Changes in Total Demand**

	2019		2020		
	III	IV	I	II	III
Total Demand	-2.1	1.1	0.4	-16.2	**-8.0**
External Demand	-3.4	1.6	0.3	-14.3	**-6.9**
Total Domestic Demand	1.1	-0.2	0.5	-20.8	**-10.7**
Consumption Expenditure	3.5	3.0	0.1	-19.1	**-7.2**
Public	2.6	4.3	6.9	19.5	**16.3**
Private	3.8	2.6	-2.2	-28.7	**-13.7**
Gross Fixed Capital Formation	2.5	-1.7	3.2	-25.3	**-18.6**
Changes in Inventories	-1.4	-1.1	-0.4	-0.1	**0.0**

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

Meanwhile, consumption expenditure fell by 7.2 per cent year-on-year, improving from the 19 per cent decline in the preceding quarter. Private consumption expenditure shrank by 14 per cent in the third quarter. This decline outweighed the 16 per cent increase in public consumption expenditure over the same period.

LABOUR MARKET

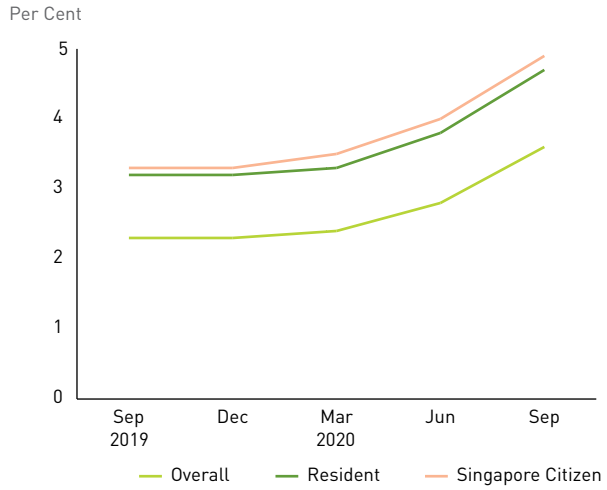
Unemployment and Retrenchment[1]

Compared to June 2020, the seasonally-adjusted unemployment rates rose in September 2020 at the overall level (from 2.8 per cent to 3.6 per cent), as well as for residents (from 3.8 per cent to 4.7 per cent) and citizens (from 4.0 per cent to 4.9 per cent) (Exhibit 1.4). While September's unemployment rates were comparable to previous recessionary highs observed during the Asian Financial Crisis[2] and GFC[3], they remained below the peaks seen during SARS[4].

1 *Retrenchment figures pertain to private sector establishments with at least 25 employees and the public sector.*
2 *In December 1998, the overall, resident and citizen unemployment rates were 3.4 per cent, 4.7 per cent and 4.8 per cent respectively.*
3 *In September 2009, the overall, resident and citizen unemployment rates were 3.3 per cent, 4.9 per cent and 4.9 per cent respectively.*
4 *In September 2003, the overall, resident and citizen unemployment rates were 4.8 per cent, 6.2 per cent and 6.4 per cent respectively.*
5 *Based on seasonally-adjusted data on the number of unemployed persons.*

In September 2020, an estimated 112,500 residents, including 97,700 Singapore citizens, were unemployed. These were higher than the number of unemployed residents (89,700) and citizens (78,800) in June 2020.[5]

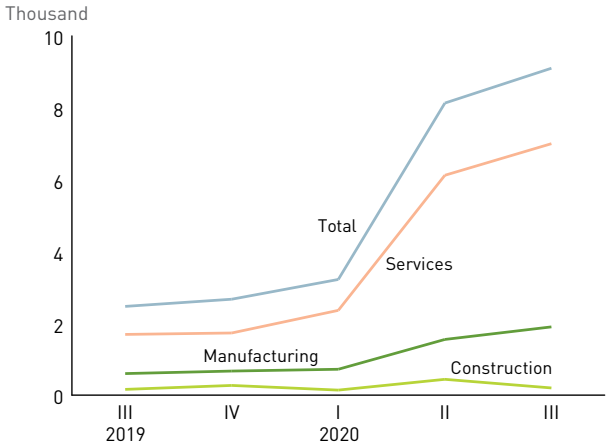
Exhibit 1.4: Unemployment Rate (Seasonally-Adjusted)



Total retrenchments increased from 8,130 in the second quarter to 9,100 in the third quarter (Exhibit 1.5). However, the number of retrenchments continued to remain lower compared to the peak recorded during the GFC (12,760 in the first quarter of 2009).

Over the quarter, retrenchments increased in the services (from 6,120 to 7,000) and manufacturing (from 1,550 to 1,900) sectors, but declined in the construction sector (from 440 to 200).

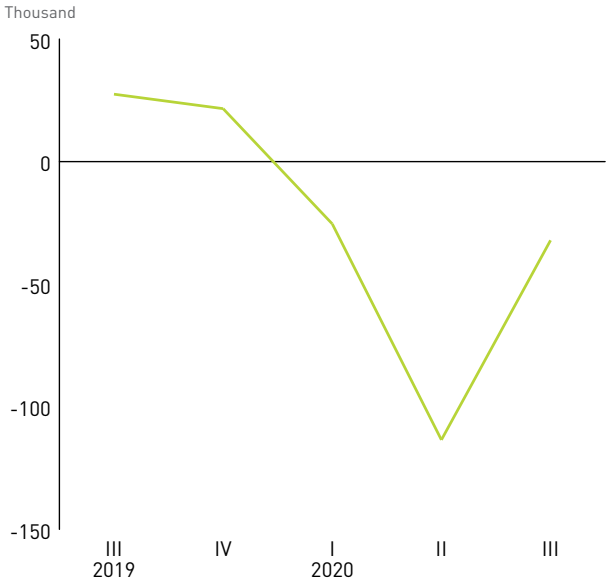
Exhibit 1.5: Retrenchments



Employment[6]

Total employment fell by 32,100 on a quarter-on-quarter basis in the third quarter (Exhibit 1.6), moderating significantly from the 113,500 decline in the preceding quarter, which was the largest quarterly contraction on record. Excluding FDWs, total employment declined by 26,900, driven by a continued contraction in non-resident employment, which outweighed a rebound in resident employment.

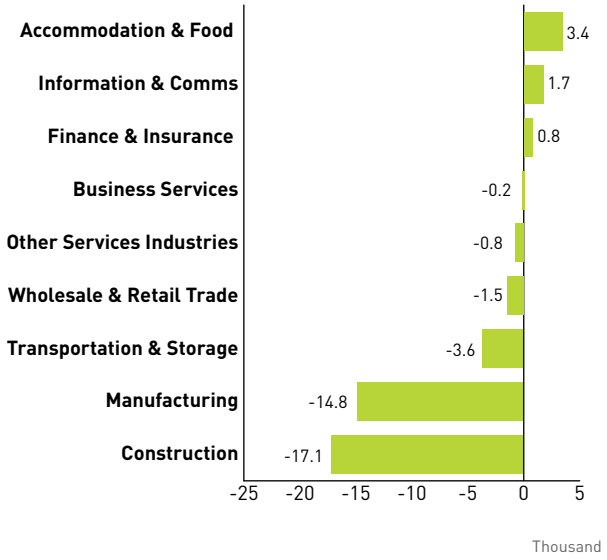
Exhibit 1.6: Change in Total Employment, Quarter-on-Quarter



Employment declines were observed across all broad sectors in the third quarter. In particular, the construction (-17,100) and manufacturing (-14,800) sectors saw the sharpest contractions in employment, led by a decline in the number of foreign workers. At the same time, employment in the overall services sector fell by 300 on the back of a decline in FDWs. Excluding FDWs, employment in the services sector increased by 5,000, supported by employment gains in the accommodation & food services (+3,400) and information & communications (+1,700) sectors (Exhibit 1.7).

6 *Based on preliminary estimates.*

Exhibit 1.7: Changes in Employment by Industry in 3Q 2020



Hiring Expectations

According to EDB's latest Business Expectations Survey for the Manufacturing Sector, hiring expectations in the sector remained subdued, with a net weighted balance of 8 per cent of manufacturers expecting to reduce hiring in the fourth quarter of 2020 as compared to the third quarter. Firms in the precision modules & components segment of the precision engineering cluster were the most pessimistic, with a net weighted balance of 29 per cent of firms expecting lower levels of hiring in the fourth quarter. By contrast, firms in the other electronic modules & components segment of the electronics cluster were optimistic, with a net weighted balance of 23 per cent of firms expecting to increase hiring in the fourth quarter.

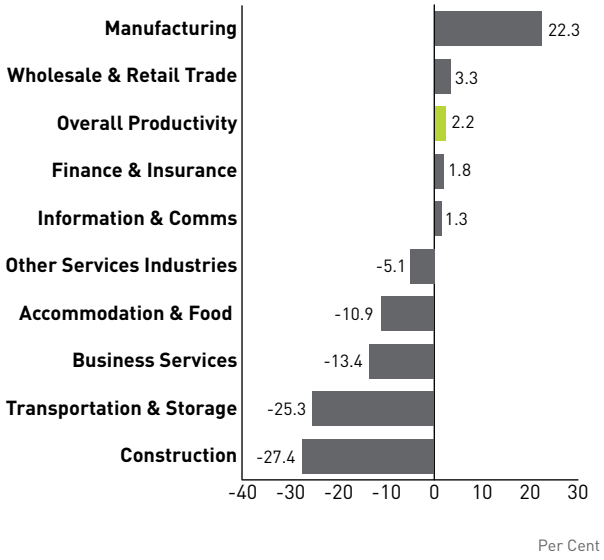
Hiring expectations for services firms were also weak. According to DOS' latest Business Expectations Survey for the Services Sector, a net weighted balance of 7 per cent of services firms expected to reduce hiring in the fourth quarter of 2020 as compared to the third quarter. Firms in the accommodation and transportation & storage sectors had the weakest hiring sentiments, with a net weighted balance of 60 per cent and 20 per cent of firms expecting to hire fewer workers in the fourth quarter respectively.

COMPETITIVENESS

Productivity

Overall labour productivity, as measured by real value-added per actual hour worked, rose by 2.2 per cent year-on-year in the third quarter, following the 2.4 per cent growth in the previous quarter (Exhibit 1.8). The increase came despite the contraction in GDP because of a larger decline in actual hours worked (-7.8 per cent year-on-year) in the third quarter. In turn, the fall in the number of actual hours worked was due to continued year-on-year declines in both average employment and average actual hours worked per worker.[7]

Exhibit 1.8: Changes in Value-Added per Actual Hour Worked for the Overall Economy and Sectors in 3Q 2020



Among the sectors, the manufacturing (22 per cent), wholesale & retail trade (3.3 per cent), finance & insurance (1.8 per cent) and information & communications (1.3 per cent) sectors posted productivity growth in the third quarter. All the other sectors saw productivity declines, with the construction (-27 per cent), transportation & storage (-25 per cent), business services (-13 per cent) and accommodation & food services (-11 per cent) sectors experiencing the largest declines.

In the third quarter, the productivity of outward-oriented sectors as a whole rose by 2.7 per cent year-on-year, exceeding the 1.9 per cent increase in the previous quarter.[8] By contrast, the productivity of domestically-oriented sectors fell by 7.6 per cent, extending the 8.6 per cent decline in the second quarter.

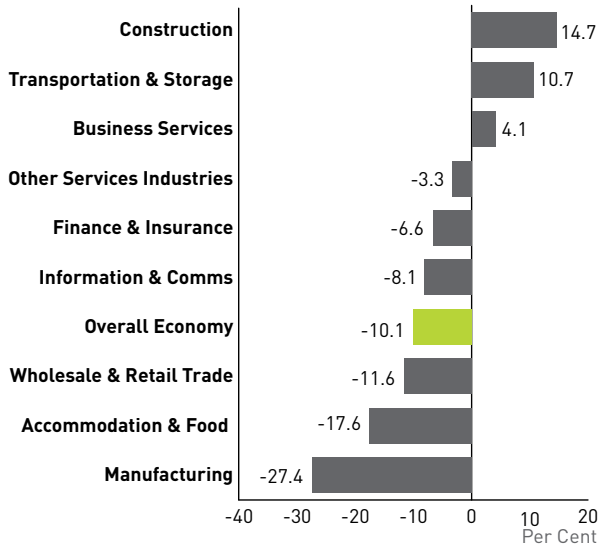
7 *Overall labour productivity, as measured by real value-added per worker, fell by 2.5 per cent in the third quarter as compared to the 12 per cent decline in the preceding quarter. The difference in trends between real value-added per actual hour worked and real value-added per worker in the third quarter was due to a fall in the number of actual hours worked per worker.*

8 *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, other business services and other services industries.*

Unit Labour Cost and Unit Business Cost

Overall unit labour cost (ULC) for the economy fell by 10 per cent on a year-on-year basis in the third quarter, moderating from the decline of 19 per cent in the preceding quarter (Exhibit 1.9). The drop in overall ULC was due to a fall in total labour cost per worker, which more than offset the decline in labour productivity as measured by real value-added per worker.

Exhibit 1.9: Changes in Unit Labour Cost in 3Q 2020



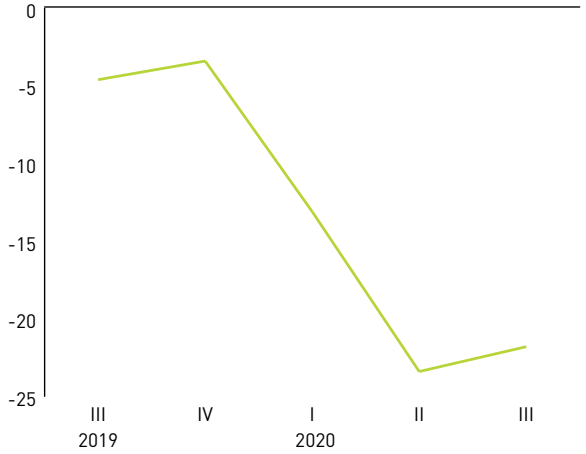
By sectors, the ULC for the manufacturing sector contracted by 27 per cent year-on-year, extending the fall of 37 per cent in the preceding quarter. The decline occurred on the back of productivity gains alongside a fall in total labour cost per worker in the sector.

Similarly, the ULC for services producing industries decreased by 4.4 per cent, a moderation from the 14 per cent fall in the preceding quarter. Most services sectors saw a decline in their ULCs, with the exception of the transportation & storage and business services sectors, which saw an increase in their ULCs as a fall in labour productivity outweighed a decline in total labour cost per worker in these sectors.

By contrast, the ULC for the construction sector rose by 15 per cent in the third quarter, slower than the 29 per cent increase in the previous quarter. The ULC of the sector increased as labour productivity fell by more than total labour cost per worker in the sector.

Unit business cost (UBC) for the manufacturing sector fell by 22 per cent year-on-year in the third quarter, extending the 23 per cent decline in the previous quarter (Exhibit 1.10). This came on the back of declines in the manufacturing ULC (-27 per cent), unit services cost (-20 per cent) and unit non-labour production taxes (-34 per cent).

Exhibit 1.10: Changes in the Manufacturing Unit Business Cost

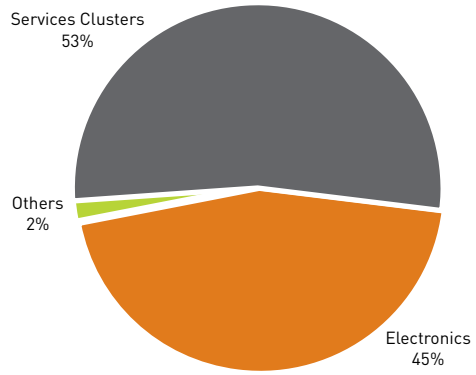


Investment Commitments

Investment commitments garnered by the Economic Development Board (EDB) in terms of Fixed Asset Investments (FAI) and Total Business Expenditure (TBE) amounted to $2.1 billion and $914 million respectively in the third quarter (Exhibit 1.11 and Exhibit 1.12).

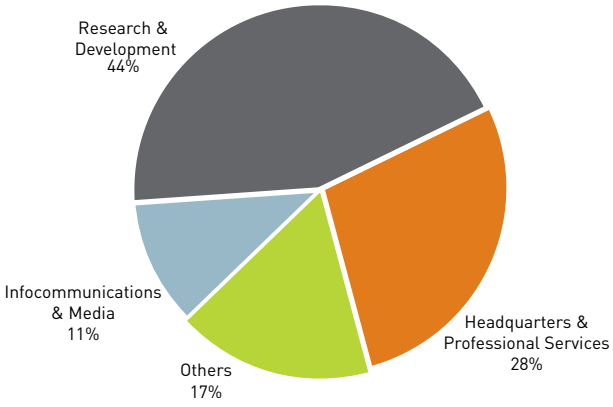
In terms of FAI, the largest contribution was from the services sector, which attracted $1.1 billion worth of commitments. Within the services sector, the research & development and infocommunications & media clusters saw the highest amounts of commitments, at $629 million and $374 million respectively. Meanwhile, the electronics cluster attracted $924 million worth of FAI commitments, the highest amongst the manufacturing clusters. Investors from the United States were the largest contributor to total FAI, with $1.0 billion (49 per cent) in commitments, followed by investors from Europe, with $931 million (45 per cent).

Exhibit 1.11: Fixed Asset Investments by Industry Cluster in 3Q 2020



For TBE, the services clusters attracted the highest amount of commitments, at $838 million. This was led by the research & development cluster, which secured $403 million in commitments, followed by the headquarters & professional services cluster, with $254 million. Among the manufacturing clusters, the electronics cluster pulled in the largest amount of TBE commitments, at $44.3 million. Local investors were the largest source of TBE commitments, at $288 million (32 per cent). They were followed by investors from the United States and Europe, with commitments of $262 million (29 per cent) and $217 million (24 per cent) respectively.

Exhibit 1.12: Total Business Expenditure by Industry Cluster in 3Q 2020



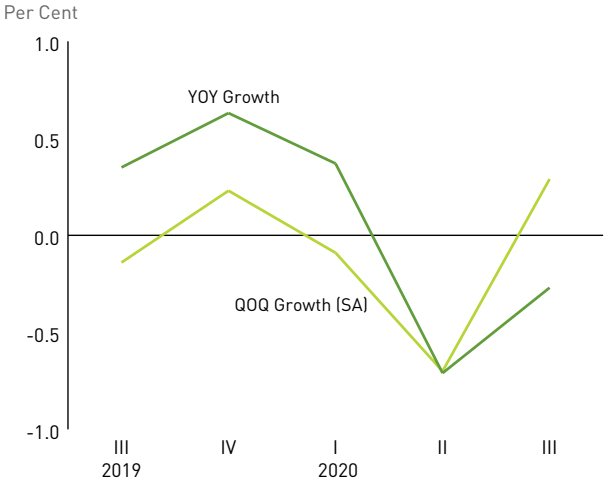
When these projects are fully implemented, they are expected to generate $7.5 billion of value-added and create more than 3,700 jobs in the coming years.

PRICES

Consumer Price Index

The Consumer Price Index-All Items (CPI-All Items) dipped by 0.3 per cent on a year-on-year basis in the third quarter, easing from the 0.7 per cent decline in the preceding quarter (Exhibit 1.13). On a quarter-on-quarter seasonally-adjusted basis, CPI-All Items rose by 0.3 per cent in the third quarter, a reversal from the 0.7 per cent decline in the previous 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 costs rose by 1.9 per cent on the back of an increase in the prices of non-cooked food items such as meat and vegetables, as well as food servicing services like hawker food and restaurant meals. Prices of household durables & services increased by 0.4 per cent on account of more expensive non-durable household goods and household durables. Communication costs climbed by 1.8 per cent due to higher telecommunication services and equipment costs.

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

Per Cent

	2019		2020		
	III	IV	I	II	III
All items	0.4	0.6	0.4	-0.7	**-0.3**
Food	1.4	1.6	1.6	2.2	**1.9**
Clothing & Footwear	-2.5	-1.6	-3.1	-3.6	**-4.0**
Housing & Utilities	-1.3	-1.3	-0.2	0.1	**-0.7**
Household Durables & Services	0.6	0.4	0.4	-0.2	**0.4**
Health Care	1.1	0.2	-1.5	-1.8	**-1.9**
Transport	0.8	2.3	2.0	-3.9	**-0.8**
Communication	-1.4	0.3	0.5	-0.3	**1.8**
Recreation & Culture	0.6	0.5	-1.0	-2.6	**-1.6**
Education	2.2	2.1	-0.6	-0.6	**-0.5**
Miscellaneous Goods & Services	0.2	0.3	-0.1	-1.4	**-1.7**

By contrast, price declines in the following CPI categories contributed negatively to CPI-All Items inflation in the third quarter. Clothing & footwear prices dropped by 4.0 per cent because of cheaper ready-made garments and footwear. Housing & utilities costs fell by 0.7 per cent as lower electricity prices and gas tariffs more than offset a rise in accommodation costs. Healthcare costs declined by 1.9 per cent on the back of a fall in the prices of outpatient services and medical products, which outweighed an increase in the cost of hospital services. Transport costs edged down by 0.8 per cent due to a drop in the prices of petrol and Electronic Road Pricing (ERP) charges that more than offset higher car prices as well as bus & train fares. Recreation & culture prices fell by 1.6 per cent as a result of the lower cost of holiday travel. Education costs dipped by 0.5 per cent on account of lower fees at childcare centres and kindergartens due to the enhancement of preschool subsidies since January 2020. Prices of miscellaneous goods & services declined by 1.7 per cent on the back of cheaper personal effects and personal care items.

INTERNATIONAL TRADE

Merchandise Trade

Singapore's total merchandise trade decreased by 6.3 per cent year-on-year in the third quarter, an improvement from the contraction of 15 per cent in the preceding quarter (Exhibit 1.15). The fall in total merchandise trade was due to a decline in oil trade which outweighed the increase in non-oil trade. Oil trade contracted by 39 per cent in nominal terms amidst lower oil prices compared to a year ago, while non-oil trade grew by 0.8 per cent.

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

Per Cent

	2019			2020		
	III	IV	Ann	I	II	III
Merchandise Trade	-6.7	-5.3	-3.2	0.5	-15.3	**-6.3**
Merchandise Exports	-7.3	-4.3	-4.2	-1.4	-14.0	**-5.0**
Domestic Exports	-13.1	-11.5	-10.5	-6.4	-21.6	**-11.4**
Oil	-19.7	-21.5	-12.9	-28.9	-67.7	**-48.6**
Non-Oil	-9.6	-5.7	-9.2	5.4	5.9	**6.5**
Re-Exports	-1.7	2.8	2.3	3.2	-6.8	**0.4**
Merchandise Imports	-5.9	-6.3	-2.1	2.6	-16.6	**-7.6**
Oil	-18.2	-20.4	-13.5	-6.2	-57.5	**-32.3**
Non-Oil	-2.3	-1.9	1.5	5.1	-5.2	**-1.5**

Total merchandise exports declined by 5.0 per cent in the third quarter, moderating from the 14 per cent contraction in the preceding quarter. Domestic exports (-11 per cent) fell, while re-exports (0.4 per cent) expanded slightly.

The fall in domestic exports was on account of a decline in oil domestic exports, which outweighed an increase in non-oil domestic exports (NODX). In particular, oil domestic exports contracted by 49 per cent, partly reflecting lower oil prices compared to a year ago. In volume terms, oil domestic exports decreased by 24 per cent.

On the other hand, NODX expanded by 6.5 per cent during the quarter, extending the 5.9 per cent growth in the previous quarter. The rise in NODX was supported by an increase in both non-electronics and electronics domestic exports.

Total merchandise imports declined by 7.6 per cent in the third quarter, smaller than the 17 per cent contraction in the previous quarter, as both oil and non-oil imports fell. Specifically, oil imports contracted by 32 per cent amidst lower oil prices compared to levels a year ago. At the same time, non-oil imports decreased by 1.5 per cent, as a decline in non-electronics imports outweighed an increase in electronics imports.

Services Trade

Total services trade contracted by 18 per cent on a year-on-year basis in the third quarter, smaller than the 22 per cent decline in the previous quarter (Exhibit 1.16). Both exports and imports of services recorded negative growth during the quarter.

Services exports fell by 18 per cent, extending the 21 per cent decline in the preceding quarter. The fall in services exports was largely attributable to declines in the exports of travel services, transport services and maintenance & repair services. Meanwhile, services imports contracted by 19 per cent, moderating from the 24 per cent fall in the previous quarter. The decline in services imports was mainly due to a drop in the imports of travel services, transport services and other business services.

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

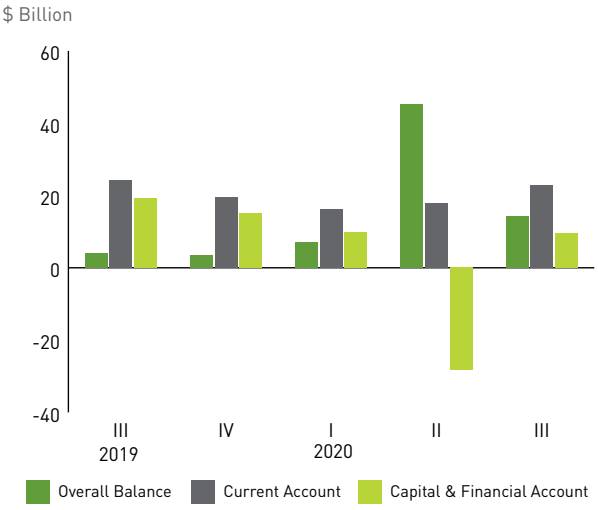
Per Cent

	2019			2020		
	III	IV	Ann	I	II	III
Total Services Trade	0.6	2.5	1.3	-3.3	-22.4	**-18.5**
Services Exports	1.9	4.5	2.2	-3.3	-20.8	**-17.8**
Services Imports	-0.8	0.6	0.4	-3.3	-24.1	**-19.2**

BALANCE OF PAYMENTS

The overall balance of payments recorded a surplus of $14 billion in the third quarter, lower than the surplus of $45 billion in the second quarter (Exhibit 1.17).

Exhibit 1.17: Balance of Payments



Current Account

The current account surplus rose to $23 billion in the third quarter, from $18 billion in the preceding quarter. This was due to increases in both the goods and services account surpluses as well as a decline in the primary income deficit. In comparison, the secondary income deficit was broadly unchanged.

The surplus in the goods balance was $32 billion in the third quarter, up from $30 billion in the previous quarter, as goods exports rose by more than goods imports.

At the same time, the surplus in the services balance edged up to $3.7 billion in the third quarter, from $3.4 billion in the preceding quarter. This was mainly due to rising net receipts of financial services and travel services, which more than offset an increase in the net payments for other business services and manufacturing services on physical inputs owned by others, as well as a fall in the net receipts of telecommunications, computer & information services.

Meanwhile, the deficit in the primary income balance fell to $10 billion in the third quarter, from $13 billion in the second quarter, as primary income payments declined by a larger magnitude compared to primary income receipts. In comparison, the deficit in the secondary income balance was broadly unchanged.

CAPITAL AND FINANCIAL ACCOUNT[9]

The capital and financial account registered a net outflow of $9.5 billion in the third quarter, a reversal from the net inflow of $28 billion seen in the preceding quarter. This was due to declines in the net inflows of "other investment" and direct investment, as well as an increase in the net outflows of portfolio investment.

Net inflows of "other investment" decreased significantly to $3.3 billion in the third quarter, from $28 billion in the preceding quarter. This was partly attributable to an increase in net outflows from resident deposit-taking corporations.

At the same time, the net inflows of direct investment fell to $14 billion in the third quarter, from $19 billion in the second quarter, as foreign direct investments into Singapore decreased by more than the fall in residents' direct investments abroad.

Meanwhile, the net outflows of portfolio investment increased from $15 billion in the second quarter to $23 billion in the third quarter, partly due to resident deposit-taking corporations shifting to a net outflow position from a net inflow position previously.

Finally, the net outflows of financial derivatives remained at $4.1 billion in the third quarter, broadly unchanged from that in the second quarter.

9 *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".*

BOX ARTICLE 1.1

SUPPLY CHAIN RECONFIGURATION AMIDST US-CHINA TRADE TENSIONS

The flare-up of trade tensions between the United States (US) and China since 2018 has contributed to pressure on global trade and supply chains. It has heightened uncertainty and added to trade costs. Global trade growth has moderated amidst US-China tensions and anti-globalisation sentiments in major advanced economies [Exhibit 1]. The weakness in global trade and pressure on supply chains have been exacerbated by the onset of the COVID-19 pandemic. As the US and China are both major economies, deterioration in US-China trade relations have far-reaching implications on economies around the world given the integrated nature of global supply chains. This article explores US-China trade tensions' effect on Singapore's supply chains.

Global trade has been weak and exacerbated by the COVID-19 pandemic

Exhibit 1: Growth in Global Trade Volume, 1Q2017-3Q2020

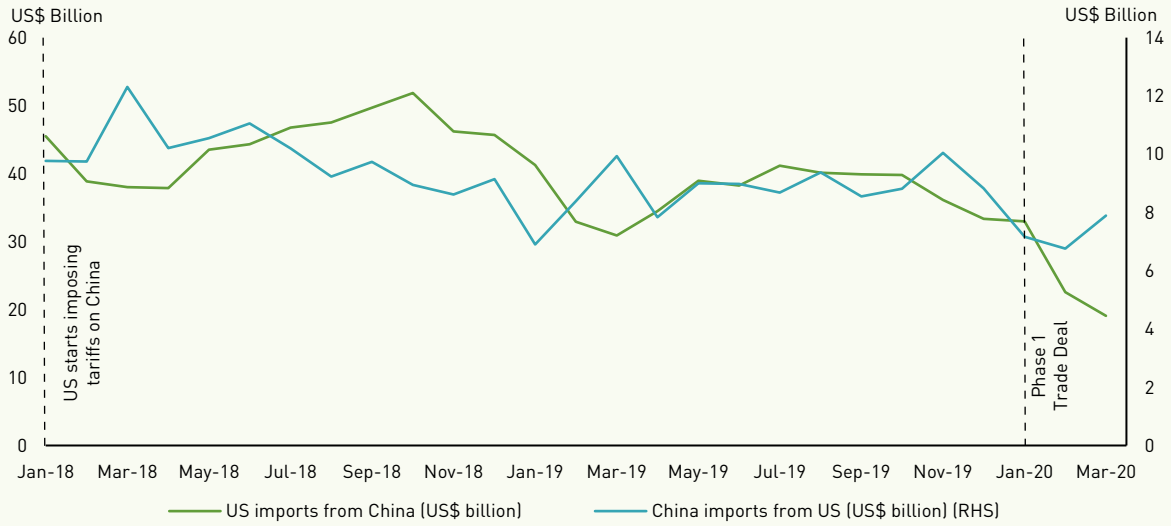
Source: World Trade Monitor, Netherlands Bureau for Economic Policy Analysis
*Data for 3Q20 is based on the first two months of the quarter

Since the start of US-China trade tensions, US' imports from China have seen a decline

Between January 2018 (start of US-China trade tensions) and March 2020[1], US imports from China fell by 58 per cent [Exhibit 2], attributable to the tariffs imposed by the US on products such as electronics, machinery, chemicals and manufacturing products.[2] In tit-for-tat measures, China imposed tariffs on agricultural and chemical products from the US, ranging from soybeans to beef and liquefied natural gas. As a result, China's imports from US also experienced a dip of 29 per cent between January 2018 and March 2020. This stabilised with the signing of the Phase 1 Trade Deal between the US and China in January 2020.

1 *Our study period ends in March 2020, around the time when the COVID-19 outbreak escalated around the world, as trade flows were disrupted by the pandemic and data were less representative of the effects of US-China trade tensions.*
2 *Peterson Institute for International Economics (PIIE), 2020. As a result of the trade conflict, the US' applied tariff rate on goods from China rose from three per cent at the start of 2018 to 21 per cent at the end of 2019. China's average applied tariff rate on imports from the US also increased from eight per cent to 21 per cent over the same period. In January 2020, the Phase One Trade Deal was signed. Under that, the US halved its tariffs on US$125 billion worth of goods and removed planned tariffs on US$160 billion worth of goods, while China agreed to increase the purchase of US goods by US$200 billion over two years.*

Exhibit 2: China and US monthly imports (US$ billion), 2018-2020

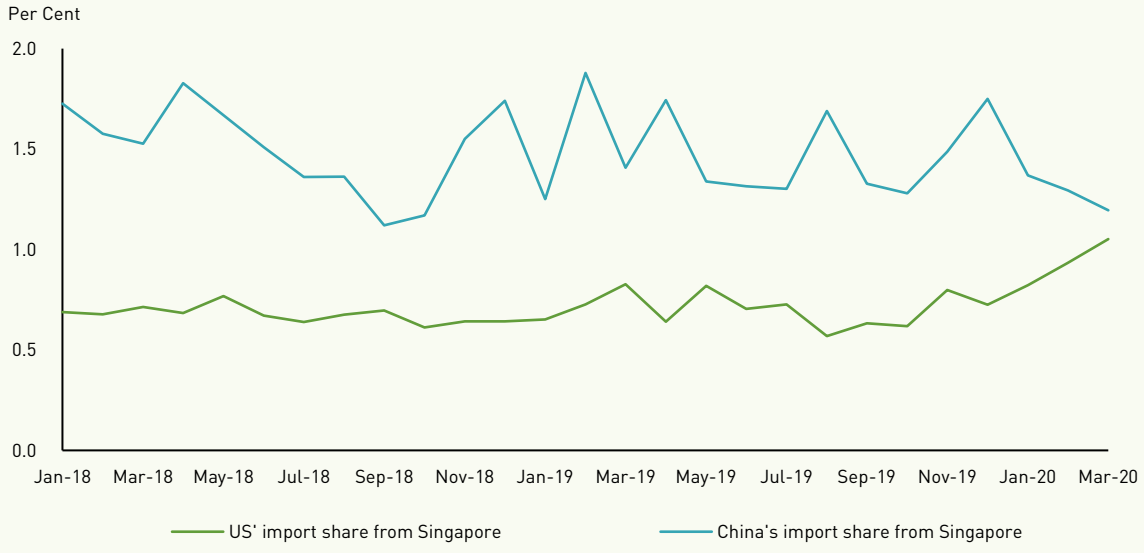


Source: Seabury

During this time, Singapore's domestic exports to China and the US have remained relatively stable

Given the integrated nature of global supply chains, trade tensions between the US and China could have had far-reaching impact not just on the quantity and composition of their trade with each other, but also on their trade with other countries. In the case of Singapore, US' import share from Singapore stayed relatively constant from 2018 to 2019, with a slight increase since the start of 2020 [Exhibit 3]. Similarly, China's import share from Singapore remained relatively stable in 2018 and 2019 after an initial dip at the start of the trade tensions. While the shifts in trade patterns are small at the overall level, larger shifts could have occurred at the sectoral or product level.

Exhibit 3: China's and US' import shares from Singapore, 2018-2020



Source: Enterprise Singapore and Seabury | Note: Computed using Singapore's domestic exports value

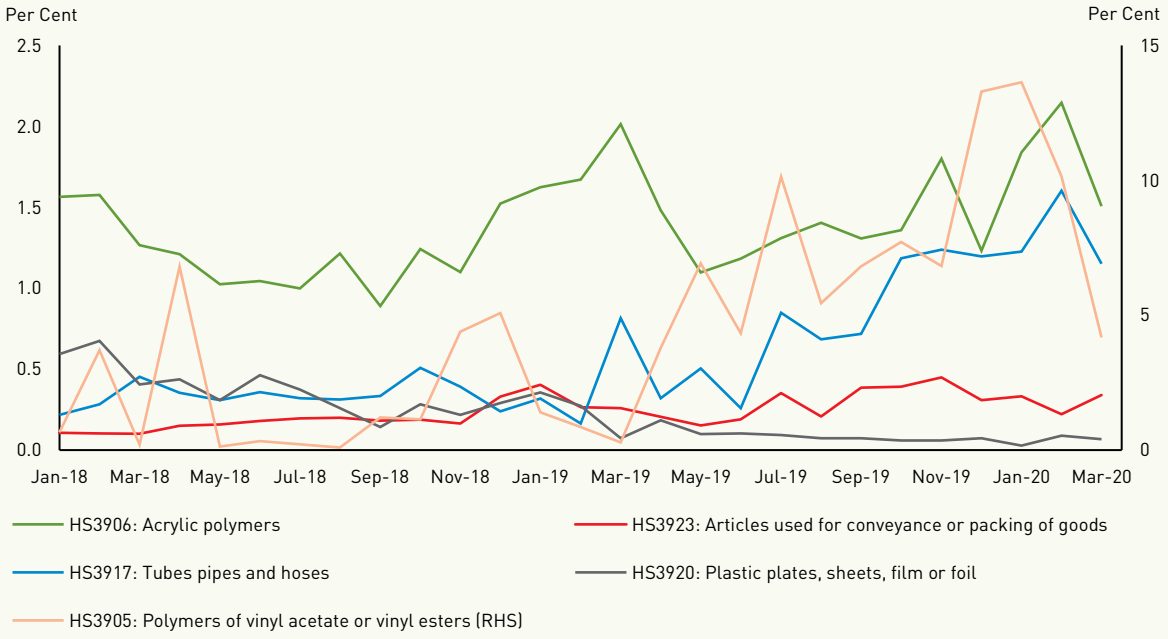
The next section examines changes in US' and China's import shares from Singapore for products that (i) were exposed to tariffs imposed by either China or the US, and (ii) formed a relatively sizeable share of Singapore's domestic exports basket to either economy. Two product categories are covered under the analysis for the US, namely (i) plastic products and materials, and (ii) electrical machinery and equipment. For the analysis for China, we will focus on (i) petroleum and chemical products, and (ii) products such as electrical machinery and parts and food preparations.

Singapore's exports to the US and China encountered both opportunities and competition

Shifts in US' import shares from Singapore

In general, it is observed that the US increased its import shares from Singapore for plastic products and materials [Exhibit 4], except for plastic plates, sheets, film or foil (HS 3920). For instance, US' import share from Singapore for polymers of vinyl acetate or vinyl esters (HS 3905) increased from 0.6 per cent to 4.2 per cent between January 2018 and March 2020. As the US could have been diversifying its import sources for plastic products, this reflected a possible growth opportunity for Singapore.

Exhibit 4: Shifts in US' import shares from Singapore for plastic products and materials, 2018-2020



Source: Enterprise Singapore and Seabury | Note: Computed using Singapore's domestic exports value

The picture was more mixed for Singapore's exports of electrical machinery and equipment, as there were both gains and losses in US' import shares from Singapore for these products. While Singapore gained US' import share for products such as transmission apparatus for broadcasting (HS 8525) and electric sound or visual signalling apparatus (HS 8531)[Exhibit 5], Singapore's exports of electrical apparatus for switching and protecting electrical circuits (HS 8536) saw a deterioration in their share of US' imports [Exhibit 6].

Exhibit 5: Shifts in US' import shares from Singapore for electrical machinery and equipment (gained), 2018-2020

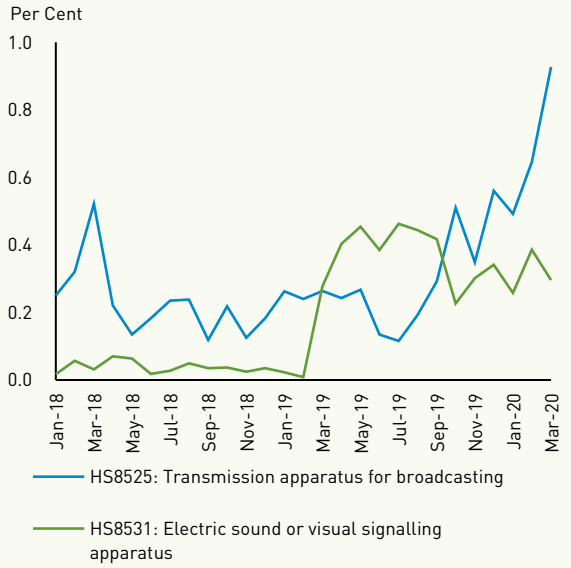
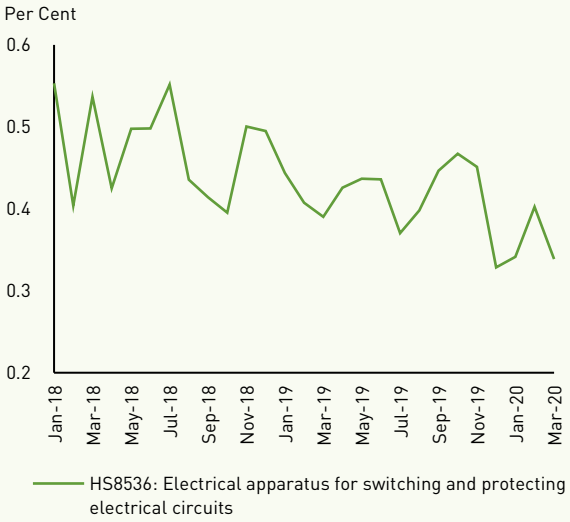


Exhibit 6: Shifts in US' import shares from Singapore for electrical machinery and equipment (lost), 2018-2020



Source: Enterprise Singapore and Seabury | Note: Computed using Singapore's domestic exports value

Shifts in China's import shares from Singapore

Singapore's exports of petroleum and chemical products generally gained import shares in China. As China had imposed tariffs on the imports of various chemical products from the US[3], Singapore's chemical suppliers would have become more competitive as an alternative source for Chinese manufacturers. In particular, China's import share from Singapore for petroleum coke and bitumen (HS 2713) rose from 7.8 per cent in January 2018 to almost 19 per cent in March 2020 [Exhibit 7]. China's import shares from Singapore for polyacetals, polyethers and epoxide resins (HS 3907) and metal pickling preparations (HS 3810) also rose steadily during this period. In comparison, Singapore's exports of organic chemicals (HS 2923) saw a loss in import share [Exhibit 8].

Exhibit 7: Shifts in China's import shares from Singapore for chemical products (gained), 2018-2020

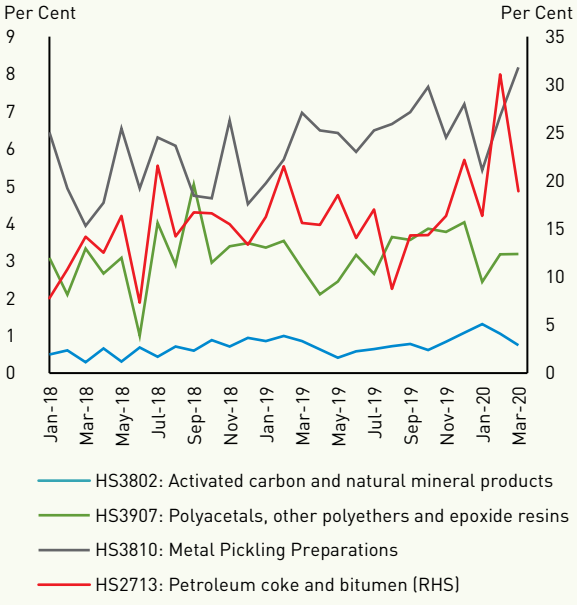
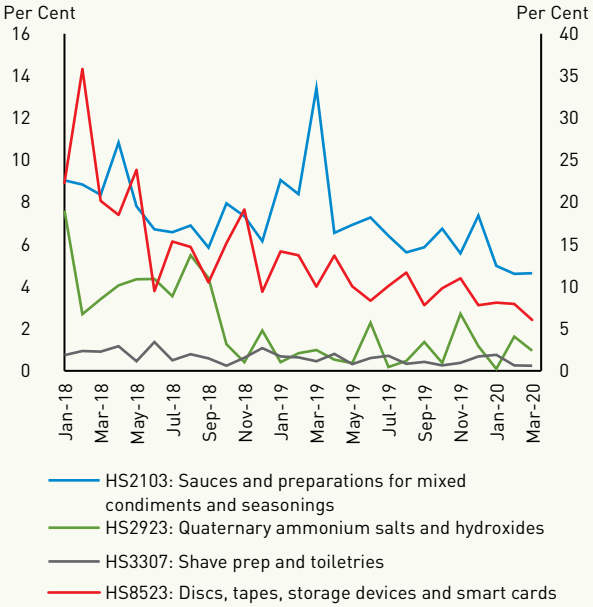


Exhibit 8: Shifts in China's import shares from Singapore (lost), 2018-2020



Source: Enterprise Singapore and Seabury | Note: Computed using Singapore's domestic exports value

3 *China's tariffs on US' products included a wide variety of petrochemicals, specialty chemicals (polyethylene, polyvinyl chloride (PVC) and polycarbonates) and plastics.*

Meanwhile, Singapore's exports of edible preparations required for food manufacturing (HS 2103) and electrical machinery and parts such as disc tapes (HS 8523) registered a decline in China's import share. Interestingly, Singapore's exports of electrical machinery and parts to other markets such as Malaysia and Thailand have risen since early 2019 in comparison, suggesting some shift in supply chains for intermediate products within the region.

The analysis above indicates how US-China trade tensions resulted in both opportunities and competition for Singapore's exports. While Singapore's exporters increased their share of the US market for selected plastic products, the shifts were less clear for the exports of electrical machinery and equipment. With China, Singapore's exporters saw an increase in China's import share for some chemicals, while exports of electrical machinery and parts such as disc tapes lost import share.

Global uncertainties persist

As a small and open economy, Singapore is highly exposed to the impact of global developments, including trade tensions by other economies that impact global supply chains. Looking ahead, challenges in the external environment remain. Anti-globalisation sentiments in major advanced economies have yet to recede, and increased protectionism could result in measures that cause further disruption to global supply chains.

On Singapore's part, we remain committed to upholding an inclusive and predictable international trading system, strengthening our trade network, and seeking out new opportunities and markets. We will also enhance supply chain resilience through diversification and further growing our global connectivity. At the same time, it is important for firms to stay agile and adapt to changes to stay plugged in to the global economy.

References

Peterson Institute for International Economics (PIIE). 2020. "US-China Trade War Tariffs: An Up-to-Date Chart". https://www.piie.com/research/piie-charts/us-china-trade-war-tariffs-date-chart. Retrieved 19 Nov 2020

Contributed by:

Economics Division
Supply Chain Resilience Division
Ministry of Trade and Industry

CHAPTER 2

SECTORAL PERFORMANCE

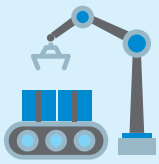

RoBi 2

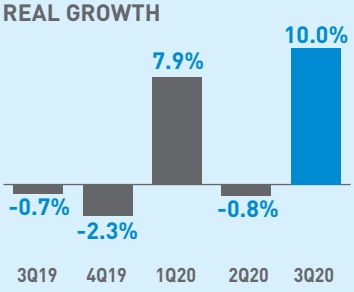
CHAPTER 2

SECTORAL PERFORMANCE

MANUFACTURING

REAL GROWTH





CLUSTERS IN MANUFACTURING SECTOR %-POINT CONTRIBUTION IN 3Q20

8.3% Electronics

5.1% Biomedical Manufacturing

0.9% Precision Engineering

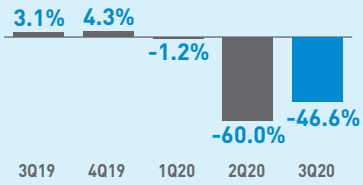
0.1% Chemicals

-1.3% General Manufacturing Industries

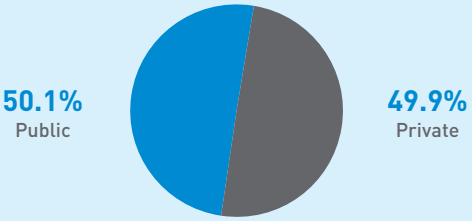
-3.1% Transport Engineering

CONSTRUCTION

REAL GROWTH



CERTIFIED PAYMENTS IN 3Q20



CONTRACTS AWARDED IN 3Q20

-16.6% Civil Engineering

-51.4% Commercial

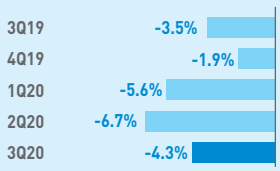
-74.1% Restential

-86.8% Institutional & Others

-92.0% Industrial

WHOLESALE & RETAIL TRADE

REAL GROWTH



WHOLESALE TRADE

Foreign Wholesale Trade Index Growth

-3.8%

Domestic Wholesale Trade Index Growth

-23.7%

RETAIL TRADE

Retail Sales Index Growth (Motor Vehicles)

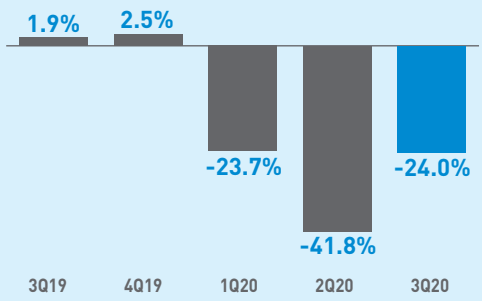
0.0%

Retail Sales Index Growth (Non-Motor Vehicles)

-10.1%

ACCOMMODATION & FOOD SERVICES

REAL GROWTH



ACCOMMODATION

Occupancy Rates of Hotels (Y-O-Y Change)

Luxury
-40.6%-pt

Upscale
-43.6%-pt

Mid-Tier
-28.4%-pt

Economy
-15.8%-pt

FOOD SERVICES

F&B Sales Index Growth (Y-O-Y Change)

Fast Food
-13.4%

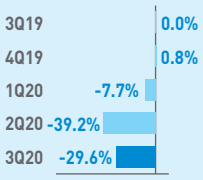
Others
-17.5%

Restaurants
-33.0%

Food Caterers
-65.1%

TRANSPORTATION & STORAGE

REAL GROWTH



Total Sea Cargo Handled Growth

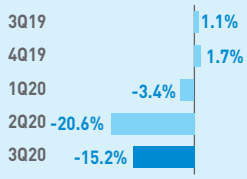
-3.0%

Air Passengers Handled Growth

-98.5%

BUSINESS SERVICES

REAL GROWTH



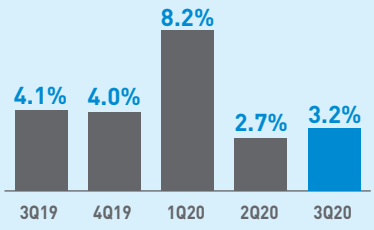
PRIVATE RESIDENTIAL REAL ESTATE

22.3%
Units Transacted
(Y-O-Y Change)

0.8%
Price Index
(Q-O-Q Change)

FINANCE & INSURANCE

REAL GROWTH



GROWTH OF BANK LOANS & ADVANCES TO NON-BANK CUSTOMERS IN 3Q20

Loans to Businesses

-0.2%

Consumer Loans

-2.4%

OVERVIEW

In the third quarter of 2020,

- The manufacturing sector expanded by 10 per cent, reversing the 0.8 per cent contraction in the second quarter. Growth in the sector was driven by expansions in the electronics, biomedical manufacturing, precision engineering and chemicals clusters. On the other hand, the transport engineering and general manufacturing clusters registered output declines.
- The construction sector shrank by 47 per cent, extending the 60 per cent contraction in the preceding quarter, due to lower levels of private and public sector construction output.
- The wholesale & retail trade sector contracted by 4.3 per cent, improving from the 6.7 per cent contraction recorded in the previous quarter. Within the sector, both the wholesale trade and retail trade segments contracted.
- The transportation & storage sector shrank by 30 per cent, a moderation from the 39 per cent decline in the previous quarter, driven primarily by the weak performance of the air transport, water transport and land transport segments.
- The accommodation & food services sector contracted by 24 per cent, improving from the 42 per cent contraction in the preceding quarter, as both the accommodation and food services segments continued to shrink during the quarter.
- The finance & insurance sector expanded by 3.2 per cent, faster than the 2.7 per cent growth in the previous quarter. Growth was primarily underpinned by steady expansions in the banking and insurance segments.
- The business services sector shrank by 15 per cent, extending the 21 per cent decline in the previous quarter, on account of contractions in the real estate, professional services and "others" segments.

MANUFACTURING

Manufacturing output increased by 10 per cent on a year-on-year basis in the third quarter (Exhibit 2.1). All manufacturing clusters recorded output expansions, except for the transport engineering and general manufacturing clusters (Exhibit 2.2).

The electronics cluster expanded by 22 per cent in the third quarter. The cluster's growth was largely driven by the semiconductors segment, which grew by 27 per cent on account of robust semiconductor demand from cloud services, data centres and the 5G market. Meanwhile, the other electronics modules & components segment expanded by 5.9 per cent. By contrast, output in the infocomms & consumer electronics and computer peripherals & data storage segments fell by 20 per cent and 12 per cent respectively.

Exhibit 2.1: Manufacturing Sector's Growth Rate

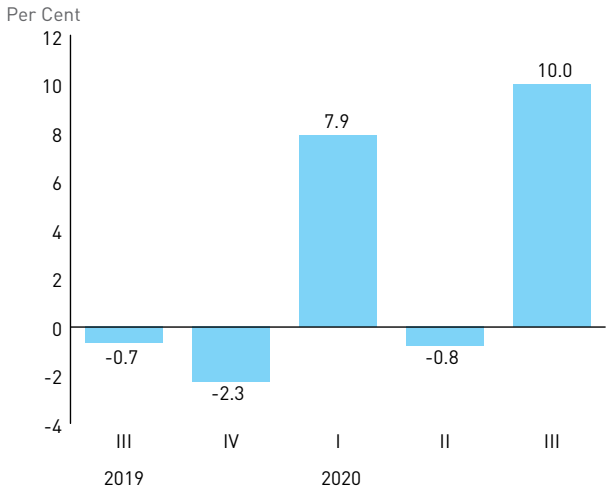
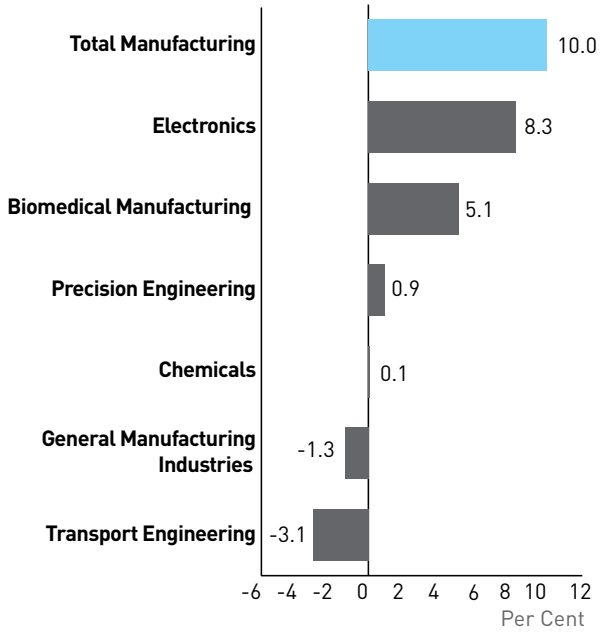


Exhibit 2.2: Percentage-Point Contribution to Manufacturing Sector's Growth in 3Q 2020



Output in the biomedical manufacturing cluster rose by 26 per cent in the third quarter. The pharmaceuticals segment expanded by 33 per cent on the back of a higher level of production of active pharmaceutical ingredients and biological products. At the same time, the medical technology segment grew by 7.2 per cent due to higher export demand for medical devices.

The precision engineering cluster grew by 6.7 per cent in the third quarter. Growth in the cluster was bolstered by the machinery & systems segment, which registered a 13 per cent increase in output due to healthy demand for semiconductor equipment from major semiconductor manufacturers. On the other hand, output in the precision modules & components segment declined by 7.0 per cent, weighed down by a drop in the production of optical products and dies, moulds, tools, jigs & fixtures.

Output in the chemicals cluster increased slightly by 0.5 per cent in the third quarter. Growth was supported by the petrochemicals and specialty chemicals segments, which expanded by 3.9 per cent and 5.4 per cent respectively, with the latter recording a rise in the output of industrial gases and mineral oil additives. By contrast, the petroleum and other chemicals segments contracted by 20 per cent and 6.8 per cent respectively, weighed down by plant maintenance shutdowns and lower export orders amidst the COVID-19 outbreak.

Output in the general manufacturing cluster fell by 16 per cent in the third quarter, weighed down by declines in all segments. In particular, the miscellaneous industries segment contracted by 23 per cent due to a drop in the production of construction-related products arising from the slow resumption of domestic construction activities. Similarly, the output of the food, beverages & tobacco segment declined by 10 per cent, largely weighed down by a lower level of production of milk powder as a result of plant maintenance shutdowns. Meanwhile, the printing segment contracted by 19 per cent.

The transport engineering cluster shrank by 37 per cent in the third quarter, pulled back by the aerospace and marine & offshore engineering (M&OE) segments. Output in the aerospace segment declined by 36 per cent due to a fall in repair and maintenance work from commercial airlines amidst ongoing global travel restrictions and weak air travel. Likewise, output in the M&OE segment fell by 50 per cent as movement restrictions at foreign worker dormitories adversely affected the level of activity in shipyards. By contrast, the land transport segment grew by 12 per cent during the quarter.

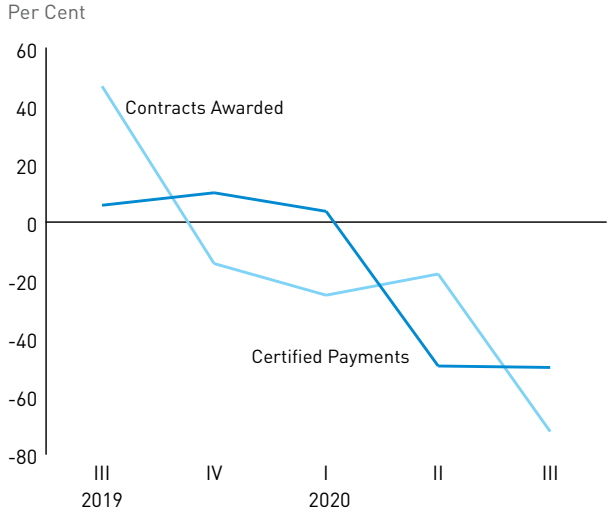
CONSTRUCTION

The construction sector contracted by 47 per cent year-on-year in the third quarter, extending the 60 per cent contraction recorded in the previous quarter. This came about as both private sector and public sector construction output declined.

During the quarter, nominal certified progress payments (a proxy for construction output) fell by 50 per cent, the same pace of decline as in the previous quarter (Exhibit 2.3). This was mainly on account of the challenges faced by construction firms in the implementation of safe management measures stipulated in the COVID-Safe Restart criteria, which led to declines in both private (-50 per cent) and public (-50 per cent) certified progress payments. The slump in private certified progress payments was largely driven by private residential building works (-53 per cent) and private industrial building works (-46 per cent). On the other hand, the plunge in public certified progress payments was led by public institutional & others building works (-61 per cent) and public civil engineering works (-50 per cent).

Meanwhile, construction demand in terms of contracts awarded plummeted by 72 per cent in the third quarter, significantly worse than the 18 per cent decline in the previous quarter (Exhibit 2.3). This was due to weaker demand for both private (-66 per cent) and public (-75 per cent) sector construction works. The former was driven by a fall in contracts awarded for private sector residential building works (-82 per cent) and private sector industrial building works (-77 per cent), while the latter was led by public industrial building works (-98 per cent) and public institutional & others building works (-86 per cent).

Exhibit 2.3: Changes in Contracts Awarded and Certified Payments

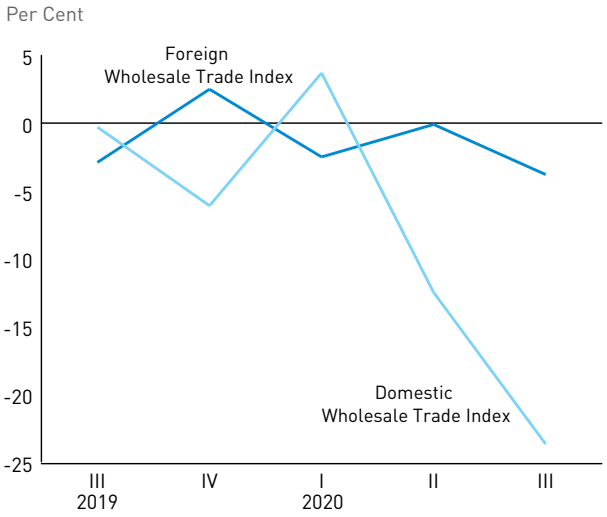


WHOLESALE & RETAIL TRADE

The wholesale & retail trade sector shrank by 4.3 per cent year-on-year in the third quarter, moderating from the 6.7 per cent contraction in the previous quarter. Within the sector, both the wholesale trade and retail trade segments contracted.

The wholesale trade segment was weighed down by foreign wholesale trade sales volumes (Exhibit 2.4), which declined by 3.8 per cent in the third quarter, larger than the 0.1 per cent drop in the previous quarter. The fall in foreign wholesale trade sales volumes came on the back of lower sales volumes of petroleum & petroleum products (-7.2 per cent), transport equipment (-38 per cent) and "other wholesale trade" (-17 per cent).[1] These declines were partially offset by expansions in the sales volumes of metals, timber & construction materials (7.1 per cent) and electronic components (13 per cent).

Exhibit 2.4: Changes in Wholesale Trade Index

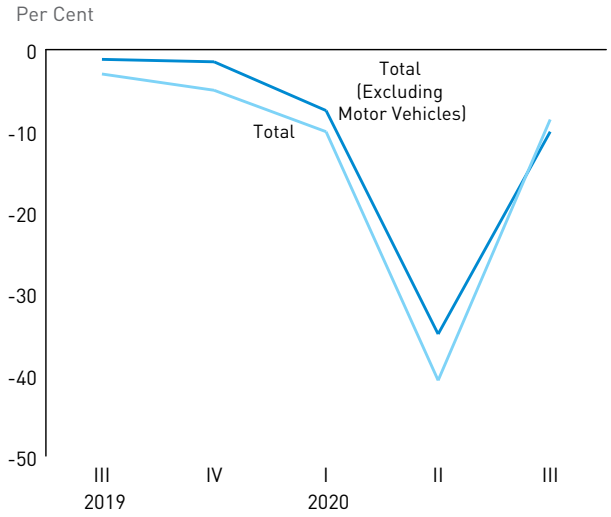


Likewise, domestic wholesale trade sales volumes fell by 24 per cent in the third quarter, extending the 13 per cent decline in the previous quarter. The drop was largely due to a fall in the sales volumes of petroleum & petroleum products (-34 per cent), metals, timber & construction materials (-34 per cent) and industrial & construction machinery (-27 per cent).

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

For the retail trade segment, overall sales volume recorded a drop of 8.6 per cent in the third quarter, an improvement from the 41 per cent decline in the previous quarter (Exhibit 2.5). The better performance was on account of the easing of Circuit Breaker measures, as retailers were allowed to operate at their physical outlets from 19 June onwards. Retail sales volume in the third quarter was weighed down mainly by non-motor vehicular sales (-10 per cent), while motor vehicular sales were flat. The former was in turn driven by a fall in the sales volume of discretionary goods, such as food & alcohol (-43 per cent), department stores (-34 per cent) and cosmetics, toiletries & medical goods (-29 per cent). By contrast, supermarkets & hypermarkets (22 per cent), furniture & household equipment (14 per cent) and recreational goods (6.8 per cent) saw an uptick in sales volume, with the higher demand likely a result of more people working from home.

Exhibit 2.5: Changes in Retail Sales Index in Chained Volume Terms

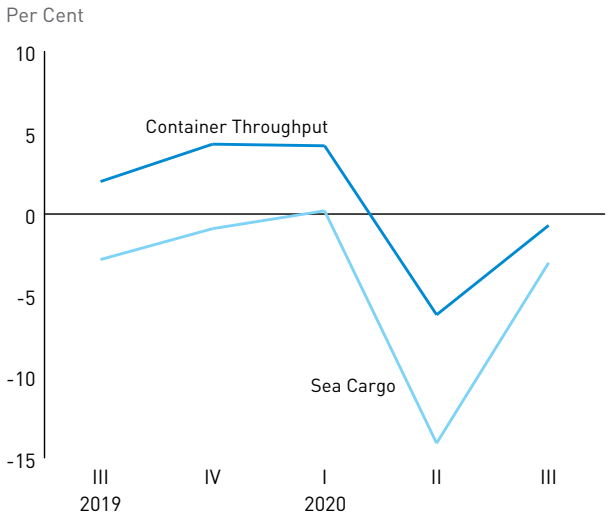


TRANSPORTATION & STORAGE

The transportation & storage sector contracted by 30 per cent year-on-year in the third quarter, slightly better than the 39 per cent decline in the previous quarter. The continued poor performance of the sector was driven mainly by the air transport, water transport and land transport segments.

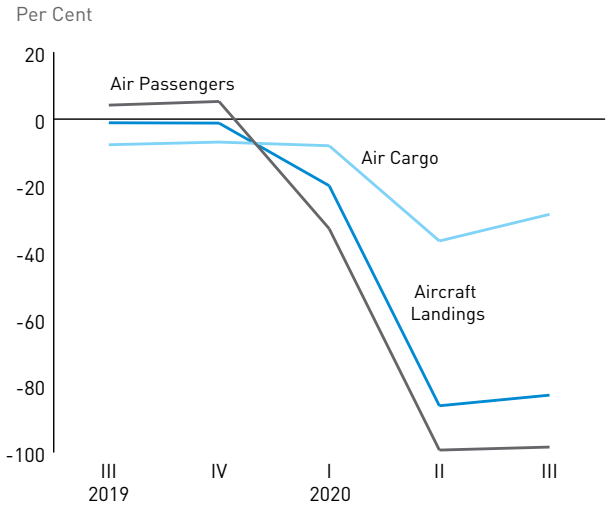
For the water transport segment, the volume of sea cargo handled fell by 3.0 per cent year-on-year in the third quarter, an improvement from the 14 per cent decline recorded in the previous quarter (Exhibit 2.6). The fall in sea cargo volume handled came as container throughput and oil-in-bulk cargo volume dipped by 0.7 per cent and 1.2 per cent respectively.

Exhibit 2.6: Changes in Container Throughput and Sea Cargo Handled



The air transport segment continued to be adversely affected by the global travel restrictions put in place to limit the spread of COVID-19 across borders. These travel restrictions, coupled with weak travel demand, resulted in a 98 per cent year-on-year plunge in the volume of air passenger traffic handled at Changi Airport in the third quarter, similar to the 99 per cent decline in the previous quarter (Exhibit 2.7). Compared to the same period a year ago, there were declines in air passenger traffic volumes across Singapore's routes with all major regions around the world. Meanwhile, total air cargo shipments handled at Changi Airport fell by 29 per cent, an improvement from the 37 per cent contraction in the second quarter. At the same time, the number of aircraft landings plummeted by 83 per cent to reach 8,212 in the third quarter, following the 86 per cent decline in the previous quarter.

Exhibit 2.7: Changes in Air Transport

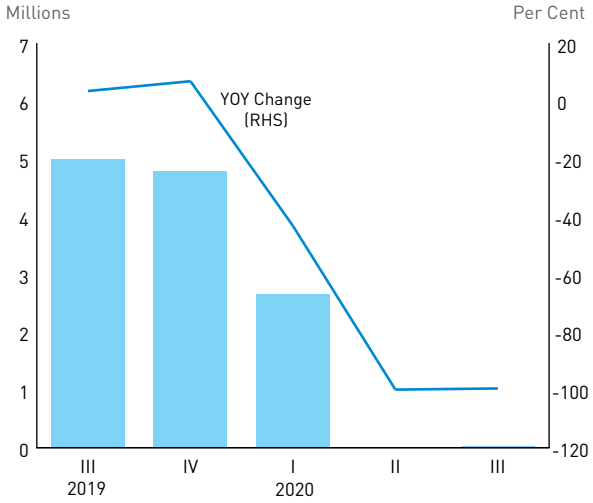


ACCOMMODATION & FOOD SERVICES

The accommodation & food services sector shrank by 24 per cent year-on-year in the third quarter, a slower pace of decline than the 42 per cent contraction observed in the preceding quarter. Within the sector, both the accommodation and food services segments contracted.

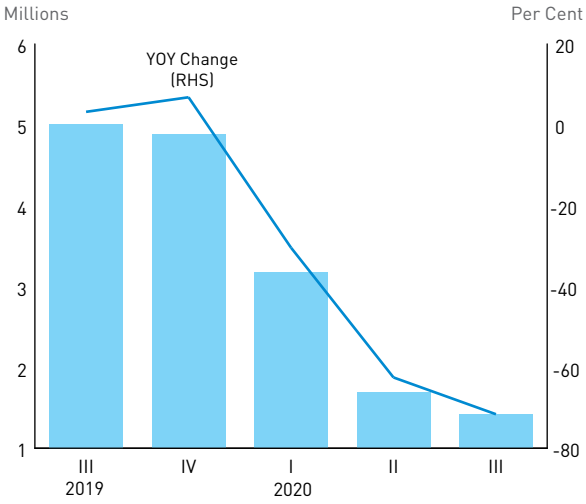
Total visitor arrivals slumped by 99.5 per cent in the third quarter, marginally better than the 99.9 per cent decline in the previous quarter (Exhibit 2.8). The near standstill in visitor arrivals was due to Singapore's border controls to limit the importation of COVID-19, as well as weak travel demand amidst the COVID-19 pandemic.[2]

Exhibit 2.8: Visitor Arrivals



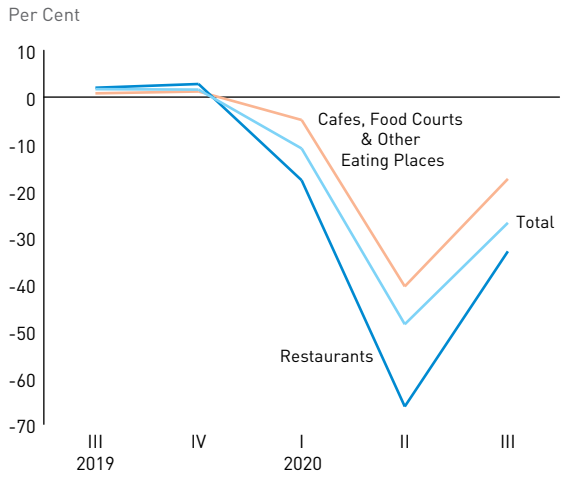
In tandem with the plunge in visitor arrivals, gross lettings at gazetted hotels plummeted by 72 per cent in the third quarter, extending the 63 per cent drop in the preceding quarter (Exhibit 2.9). As gross lettings fell by more than the decline in available room-nights (-59 per cent), the average occupancy rate of gazetted hotels slipped by 29 percentage-points on a year-on-year basis to reach 62.4 per cent in the third quarter. Nevertheless, this was higher than the average occupancy rate of 46.2 per cent registered in the second quarter.

Exhibit 2.9: Gross Lettings at Gazetted Hotels



The food services segment also continued to contract in the third quarter. Specifically, the food & beverage sales volume fell by 27 per cent in the third quarter, improving from the 49 per cent decline in the previous quarter as dining-in activities were allowed from 19 June onwards (Exhibit 2.10). Lower sales volumes were seen across-the-board during the quarter, with food caterers registering the largest decline (-65 per cent) followed by restaurants (-33 per cent), cafes, food courts & other eating places (-17 per cent) and fast food outlets (-13 per cent).

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



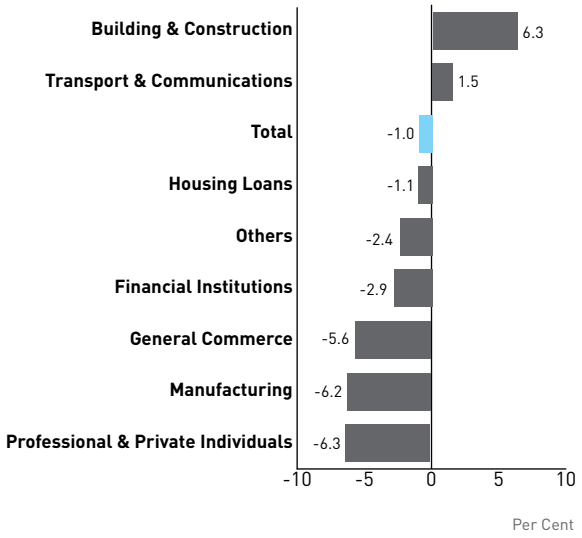
2 *On 24 March 2020, Singapore prohibited all short-term visitors from entering or transiting through Singapore. Since June 2020, Singapore has begun gradually easing border restrictions through reciprocal green lane arrangements, air travel passes and air travel bubbles.*

FINANCE & INSURANCE

The finance & insurance sector grew by 3.2 per cent year-on-year in the third quarter, faster than the 2.7 per cent growth in the preceding quarter. Growth was primarily underpinned by steady expansions in the banking and insurance segments.

Growth in the banking segment picked up in the third quarter, reflecting higher interest income from loans, as well as net commissions received from brokerage and other services. Asian Currency Unit (ACU) non-bank loan growth stayed positive at 1.6 per cent, due to resilient credit expansion to Europe and a turnaround in non-bank loan growth to East Asia. In comparison, Domestic Banking Unit (DBU) non-bank lending continued to decline by 1.0 per cent, largely due to weakening loans extended to professional & private individuals (Exhibit 2.11). There was also a contraction in loans to the general commerce and manufacturing sectors.

Exhibit 2.11: Growth of DBU Loans & Advances to Non-Bank Customers by Industry in 3Q 2020



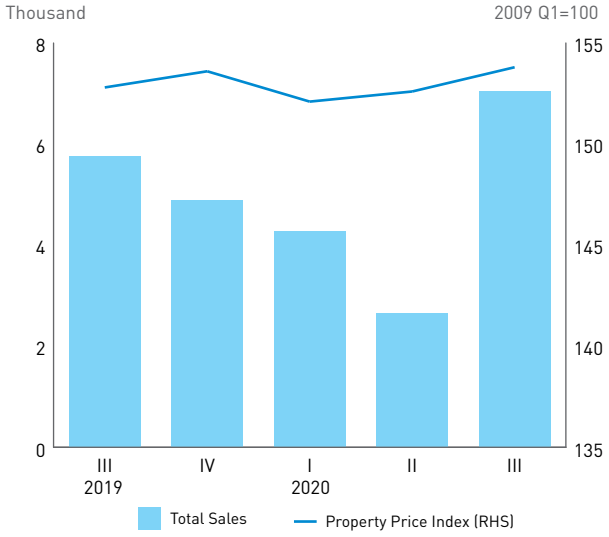
The insurance segment continued to benefit from a sustained demand for life insurance products in the third quarter. Outturns in the sentiment-sensitive segments such as forex, security dealing activities and fund management also improved. In particular, forex and security dealing activities saw strong trading volumes in the third quarter, while the performance of the fund management segment improved as global equities traded higher. In comparison, growth in other auxiliary services moderated in the third quarter, reflecting the weak performance of credit card network players.

BUSINESS SERVICES

The business services sector shrank by 15 per cent year-on-year in the third quarter, extending the 21 per cent decline in the preceding quarter. This came on the back of contractions in the real estate, professional services and "others" segments.

Within the real estate segment, the number of private residential sales transactions rose by 22 per cent during the quarter, in part due to pent-up demand arising from the suspension of operations at developers' sales galleries during the Circuit Breaker period. On the back of a pickup in sales, private residential property prices rose by 0.8 per cent on a quarter-on-quarter basis in the third quarter, improving from the 0.3 per cent increase in the previous quarter (Exhibit 2.12).

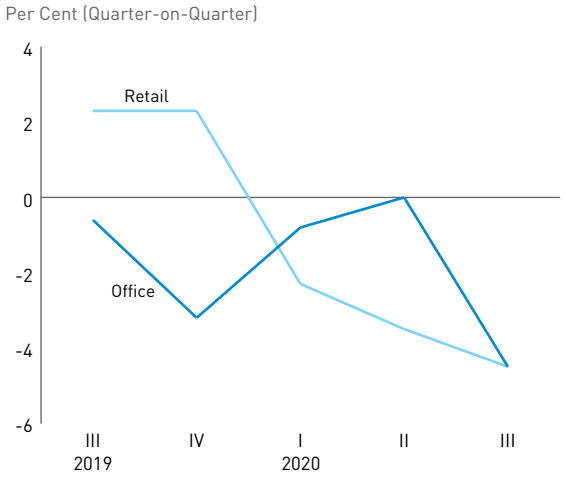
Exhibit 2.12: Total Sales Transactions for Private Residential Units and Private Residential Property Price Index



On the other hand, conditions in the commercial and industrial property space markets remained weak. For the private retail space market, rentals declined by 4.5 per cent on a quarter-on-quarter basis in the third quarter, extending the 3.5 per cent drop in the previous quarter (Exhibit 2.13). Meanwhile, the average occupancy rate of private retail space was 89 per cent during the quarter, unchanged from the preceding quarter.

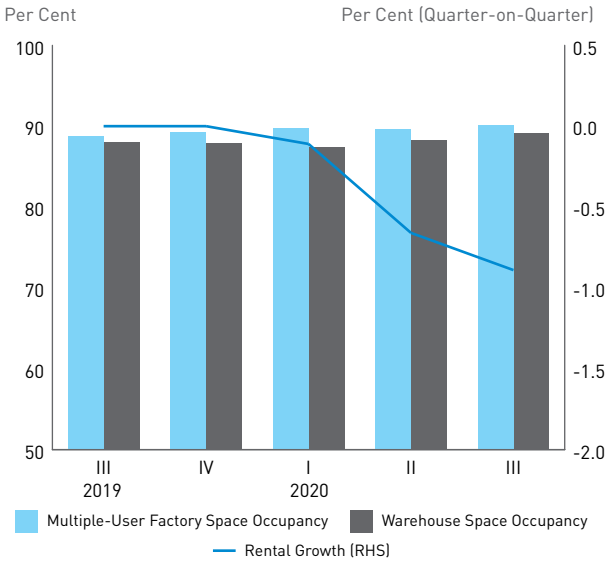
Similarly, rentals for private office space fell by 4.5 per cent on a quarter-on-quarter basis in the third quarter, worsening from the flat growth in the previous quarter. The average occupancy rate of private office space came in at 87 per cent, the same as that observed in the second quarter.

Exhibit 2.13: Changes in Rentals of Private Sector Office and Retail Spaces



For the private industrial space market, rentals fell by 0.9 per cent on a quarter-on-quarter basis in the third quarter, extending the 0.7 per cent decline in the previous quarter. The occupancy rates for private sector multiple-user factory space and private sector warehouse space stood at 90 per cent and 89 per cent respectively during the quarter, comparable to the previous quarter's rates of 90 per cent and 88 per cent respectively (Exhibit 2.14).

Exhibit 2.14: Occupancy Rate and Rental Growth of Private Sector Industrial Space



CHAPTER 3

ECONOMIC OUTLOOK

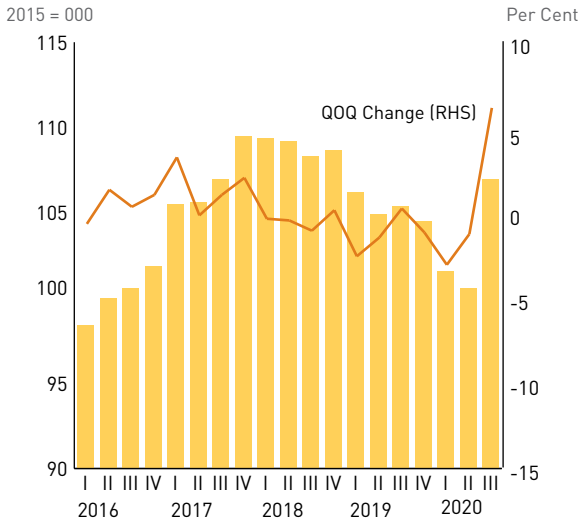
CHAPTER 3
ECONOMIC OUTLOOK

LEADING INDICATORS

On a quarter-on-quarter basis, the composite leading index (CLI) rose by 6.4 per cent in the third quarter, reversing the 1.0 per cent decline in the previous quarter (Exhibit 3.1).

Of the nine components in the CLI, seven components increased quarter-on-quarter, namely wholesale trade, US Purchasing Managers' Index, new companies formed, domestic liquidity, non-oil sea cargo handled, money supply and stock of finished goods. By contrast, stock price was flat, while non-oil retained imports declined compared to the previous quarter.

Exhibit 3.1: Composite Leading Index Levels and Growth Rate



OUTLOOK FOR 2020

Since the Economic Survey of Singapore in August, the global economic situation has remained subdued. While some economies like China are expected to see a sustained recovery for the rest of 2020 as their domestic COVID-19 outbreaks remain under control, others like the US and Eurozone are experiencing a resurgence in infections, which may dampen their recovery as restrictions are re-imposed to slow the spread of the virus.

Domestically, weak external demand conditions and ongoing global travel restrictions are expected to continue to weigh on trade-related services sectors like wholesale trade, and aviation- and tourism-related sectors like air transport and accommodation. Although consumer-facing sectors such as retail and food services have recovered from their troughs with the phased re-opening of the economy, sales volumes are likely to remain below last year's levels due to dampened consumer sentiments and capacity constraints imposed by safe management measures. On the other hand, the outlook for the manufacturing sector has improved, driven primarily by the electronics cluster on the back of robust demand for semiconductors from the 5G market, data centres and cloud services.

Taking these factors, as well as the performance of the Singapore economy in the first three quarters of the year (i.e., -6.5 per cent year-on-year), into account, the 2020 GDP growth forecast for Singapore is narrowed to **"-6.5 to -6.0 per cent"**, from "-7.0 to -5.0 per cent".

OUTLOOK FOR 2021

For 2021, the major advanced and developing economies are expected to recover from the massive economic disruptions caused by COVID-19 and see a rebound in their GDP from the low base this year. However, the path to recovery is expected to be slow and uneven across economies, with many economies not likely to return to pre-COVID levels until end-2021.

In the US, the resurgence in COVID-19 cases has prompted a pause in, or reversal of, re-opening measures in some states. These developments are likely to weigh on the labour market and dampen the recovery in personal consumption. Similarly, the surge in COVID-19 cases and re-tightening of restrictions in the Eurozone will pose a drag on consumer and business sentiments, as well as weigh on the labour market. In Asia, China is expected to maintain a robust pace of growth, supported by strong investment spending as credit levels remain elevated. Meanwhile, GDP growth in the key ASEAN economies of Malaysia, Thailand and Indonesia is expected to pick up alongside the improvement in global economic conditions.

At the same time, uncertainties and risks in the global economy remain. First, notwithstanding positive news on vaccine development, as well as advancements in therapeutics and testing, the risk of periodic resurgence of infections around the world remains. The re-imposition of lockdowns, even in a limited way, could dampen business and consumer confidence, and pose a drag on the global economic recovery. Second, the protracted nature of the economic recovery in many countries could cause renewed pressures on corporate and financial sector balance sheets, which could in turn lead to financial system stresses and financial market dislocations such as capital outflows from emerging market economies. These could then trigger feedback loops and negatively affect the global economy. Excessive private sector indebtedness arising from loose monetary conditions also remains a concern. Third, amidst elevated uncertainty surrounding the COVID-19 situation, there is a higher risk of a miscalibration of policy settings which, together with tightening funding conditions, could result in a premature withdrawal of policy support in the key economies, thereby impeding their recovery. Fourth, there continues to be geopolitical uncertainty involving the major economies, which could in turn weigh on global trade and the global economic recovery.

On balance, given the improved growth outlook for key external economies, as well as a further easing of global travel restrictions and domestic public health measures that is expected in the year ahead, the Singapore economy is projected to return to growth in 2021.

First, trade-related services sectors (e.g., wholesale trade and water transport) are expected to benefit from the pickup in external demand. At the same time, the manufacturing sector is projected to continue to expand, with the electronics and precision engineering clusters boosted by robust semiconductor demand from the 5G market. Likewise, growth in the information & communications and finance & insurance sectors is expected to remain healthy, bolstered by sustained demand for IT and digital solutions, and credit and payment processing services respectively. Second, aviation- and tourism-related sectors (e.g., air transport and accommodation) are projected to see a gradual recovery in air passenger volumes and visitor arrivals. Similarly, consumer-facing sectors (e.g., retail trade and food services) are expected to benefit from the recovery in visitor arrivals, as well as an improvement in consumer sentiments amidst better labour market conditions. However, economic activity in these sectors is not likely to return to pre-COVID levels even by end-2021. Third, the construction sector is projected to recover from the low base this year, although construction activity will continue to be dampened by the implementation of safe management measures.

Taking these factors into account, the Singapore economy is projected to grow by **"4.0 to 6.0 per cent"** in 2021. The recovery of the Singapore economy in the year ahead is expected to be gradual, and will depend to a large extent on how the global economy performs and whether Singapore is able to continue to keep the domestic COVID-19 situation under control.

FEATURE ARTICLE

Image courtesy TBA

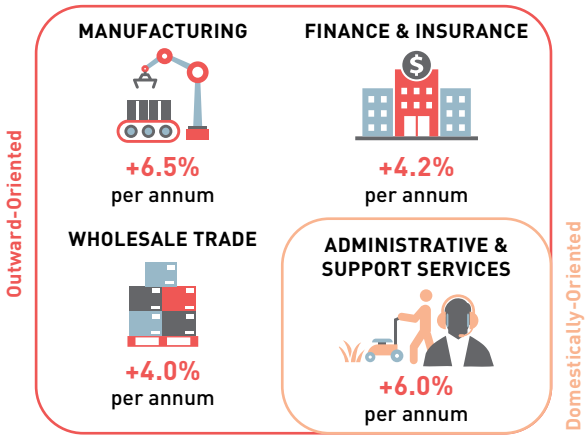
FEATURE ARTICLE

DRIVERS OF LABOUR PRODUCTIVITY GROWTH IN SINGAPORE 2009–2019

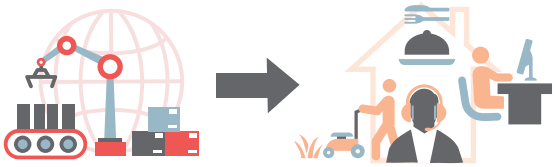
Singapore's labour productivity, as measured by real value-added per actual hour worked, grew by 2.8% per annum over the past decade, achieving the ambitious target of 2 to 3% per annum set by the Economic Strategies Committee. Singapore's productivity growth performance over the period exceeded that of most advanced economies.

SHIFT-SHARE ANALYSIS

Overall productivity growth was driven mainly by productivity improvements within sectors, particularly in outward-oriented sectors.



However, these gains were dampened slightly by a net shift in employment and hours worked from more productive outward-oriented sectors towards less productive domestically-oriented sectors.



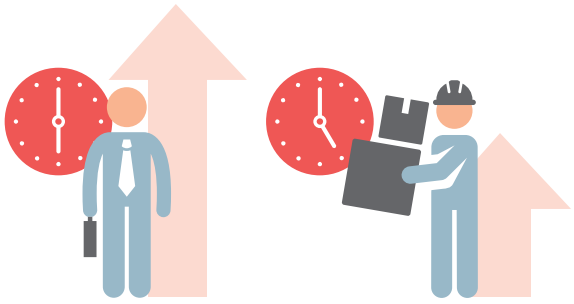
MANUFACTURING, WHOLESALE TRADE

FOOD SERVICES, OTHER SERVICES INDUSTRIES AND ADMINISTRATIVE & SUPPORT SERVICES

GROWTH ACCOUNTING ANALYSIS

Capital intensity improvements, particularly in non-residential construction & works and research & development, were the main drivers of productivity growth.

Labour quality improvements also contributed positively to productivity growth, supported by an increase in hours worked by skilled workers which outpaced that of less skilled workers.



SKILLED WORKERS

LESS-SKILLED WORKERS

CONCLUSION

Singapore's progress in raising aggregate productivity over the past decade is aligned with the Government's aims to uplift productivity to support economic growth and higher wages for Singaporeans. To sustain productivity growth over the longer term, it is important to press on with industry transformation and restructuring efforts.

EXECUTIVE SUMMARY

- This article examines Singapore's labour productivity performance over the past ten years against the productivity growth target of 2 to 3 per cent per annum set by the Economic Strategies Committee (ESC) in 2010. Shift-share and growth accounting analyses are also conducted to better understand the drivers of Singapore's labour productivity performance over the decade.

- From 2009 to 2019, Singapore's overall labour productivity, as measured by real value-added per actual hour worked, grew by 2.8 per cent per annum, achieving the target set by the ESC. Singapore's productivity growth performance over the past decade was also better than that of most advanced economies.

- The shift-share analysis finds that productivity gains over the decade were driven mainly by productivity improvements within sectors, especially the outward-oriented sectors. These gains were dampened slightly by a net shift in employment and hours worked from more productive outward-oriented sectors towards less productive domestically-oriented sectors. There are, however, signs that this shift effect has improved over time, with the effect turning positive in the later years of the decade as more productive outward-oriented services sectors such as Finance & Insurance and Information & Communications continued to gain employment and hours worked shares.

- The growth accounting analysis shows that higher capital intensity, especially in non-residential construction & works and research & development, was the main driver of productivity growth over the decade. Overall productivity growth was also supported by labour quality improvements and total factor productivity growth.

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.[1]

1. INTRODUCTION

In its report released in February 2010, the Economic Strategies Committee (ESC) set an ambitious productivity growth target of 2 to 3 per cent per annum, which would in turn support economic growth of 3 to 5 per cent per annum, for Singapore to achieve over the decade (i.e., 2009 to 2019). Against this backdrop, this article examines Singapore's productivity performance over the past decade, including the drivers of the productivity performance.

Singapore's overall labour productivity growth between 2009 and 2019 is decomposed using two approaches. The first approach is a shift-share analysis to investigate the extent to which productivity growth was due to (i) productivity changes within sectors, (ii) shifts in employment and hours worked across sectors with different productivity levels, and (iii) shifts in employment and hours worked across sectors with different productivity growth rates. The second approach is a growth accounting analysis to examine how changes in (i) capital intensity, (ii) labour quality, and (iii) total factor productivity (TFP) contributed to labour productivity growth.

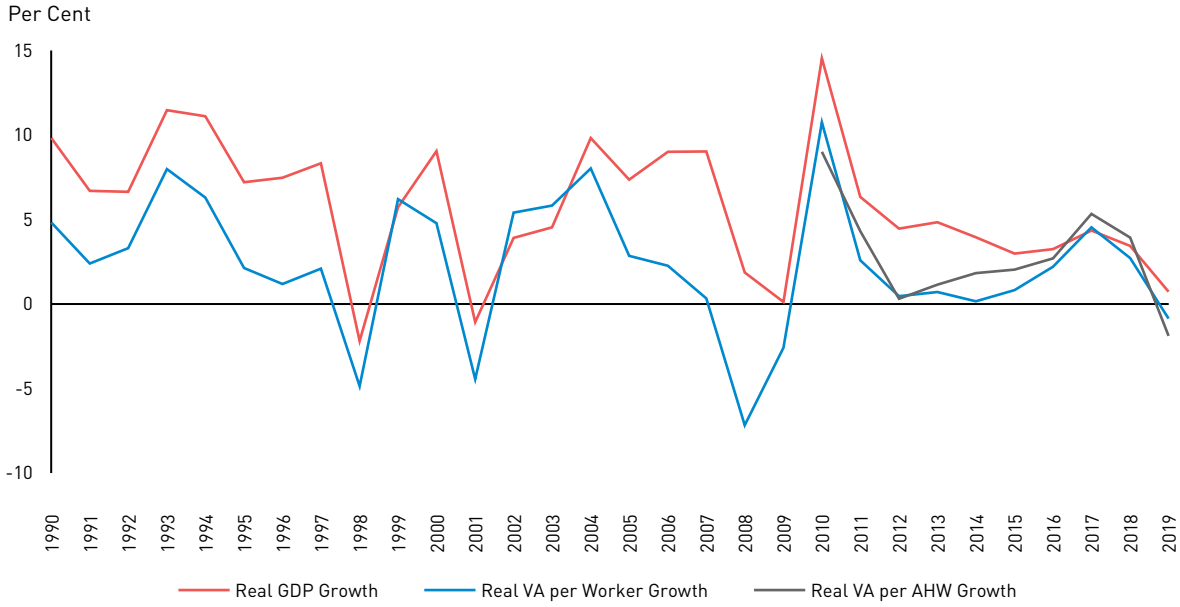
2. SINGAPORE'S PRODUCTIVITY PERFORMANCE (2009-2019)

Labour productivity measures how efficiently labour inputs are used to produce output, and can be computed in terms of real value-added (VA) per actual hour worked (AHW) or real VA per worker. Of the two measures, VA per AHW is recognised internationally, including by the International Labour Organisation, to be a better measure of labour productivity because actual hours worked capture the intensity of labour input more accurately. In Singapore's context, this measure has also become more relevant in recent years with the rising share of part-time workers in the economy, and cyclical changes in the number of hours worked by full-time workers (see Goh & Lin, 2015).

1 *We would like to thank Ms Yong Yik Wei, Dr Kuan Ming Leong and Mr Lee Zen Wea for their useful suggestions and comments. All errors belong to the authors.*

Productivity growth in Singapore generally follows a pro-cyclical pattern (Exhibit 1). During downturns, productivity falls in line with Gross Domestic Product (GDP) as firms cut output before letting go of workers. During upturns, firms boost their output but hire workers with a lag. Given the effect of business cycles on productivity, Singapore's productivity performance is better analysed over a longer time horizon, rather than for individual years.

Exhibit 1: Singapore's Real GDP, Real VA per Worker and Real VA per AHW Growth, 1990-2019



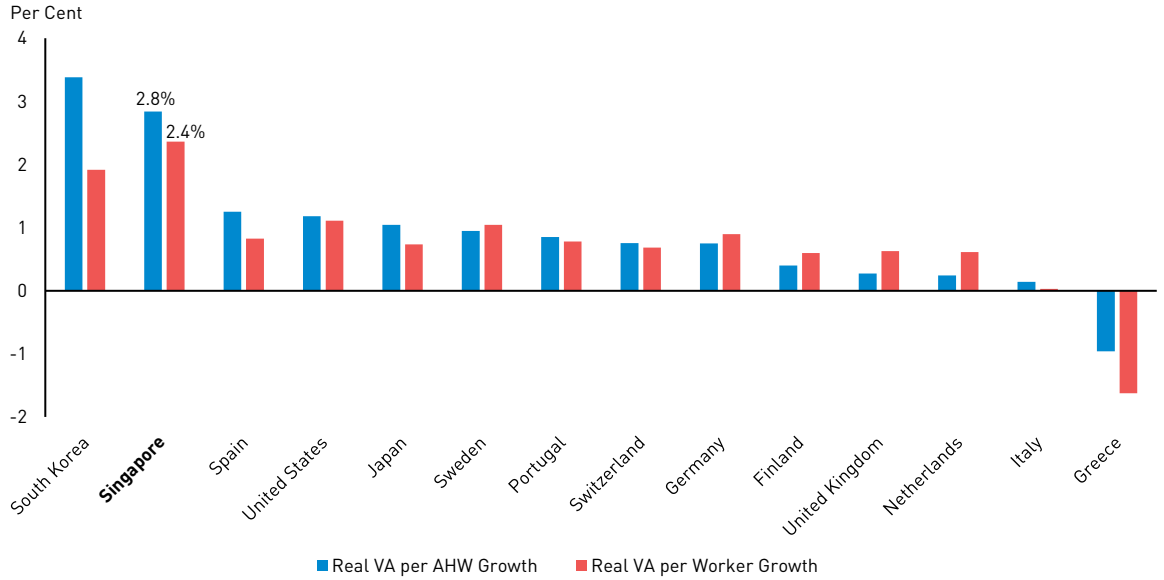
Source: DOS, MTI Staff Estimates
Note: Data for real VA per AHW growth is only available from 2010.

Over the past decade, both measures of labour productivity (i.e., real VA per AHW and real VA per worker) met the ESC's productivity growth target of 2 to 3 per cent per annum. Between 2009 and 2019, real VA per AHW grew at a compounded annual growth rate (CAGR) of 2.8 per cent.[2] In terms of real VA per worker, productivity rose by 2.4 per cent per annum, improving from the 1.4 per cent per annum growth in the preceding decade (i.e., 1999 to 2009). Cumulatively, Singapore's productivity increased by one-quarter (VA per worker) to one-third (VA per AHW) over the decade.

An international comparison shows that Singapore's productivity growth performance over the decade was better than that of most advanced economies (Exhibit 2). Between 2009 and 2019, real VA per AHW growth in Singapore (2.8 per cent per annum) exceeded that of the United States (1.2 per cent per annum), Japan (1.0 per cent per annum) and Switzerland (0.8 per cent per annum). Similarly, real VA per worker growth in Singapore (2.4 per cent per annum) surpassed that of South Korea (1.9 per cent per annum), United States (1.1 per cent per annum) and Germany (0.9 per cent per annum) over this period.

2 *Excluding the rebound in 2010 following the Global Financial Crisis (GFC), productivity growth between 2010 and 2019 remained healthy, at 2.2 per cent per annum (in terms of VA per AHW) and 1.5 per cent per annum (in terms of VA per worker). The better VA per AHW growth was due to a fall in hours worked per full-time worker and a rise in the share of part-time workers in the economy during this period.*

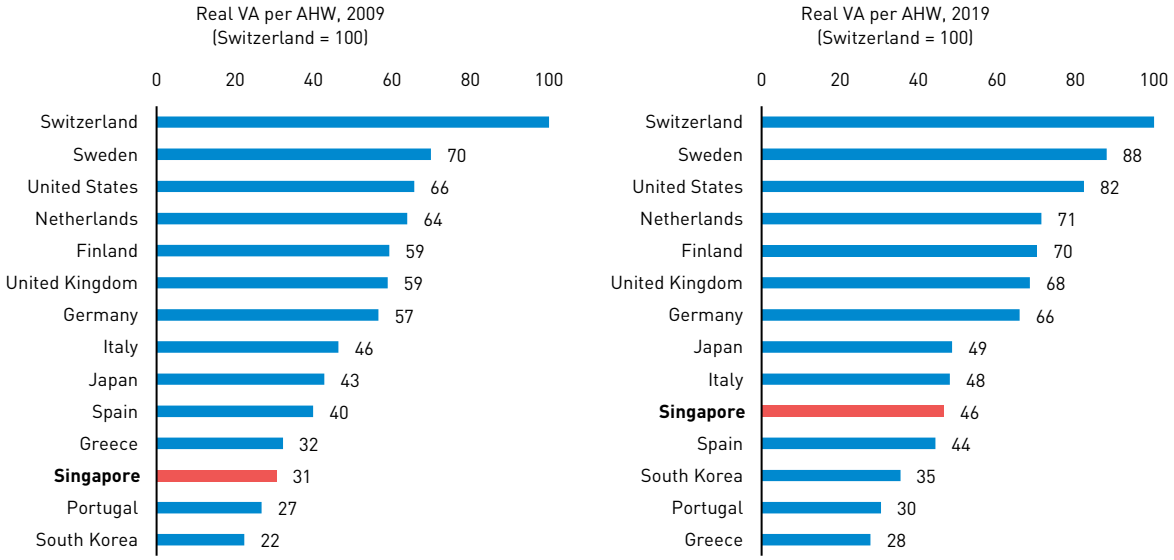
Exhibit 2: Productivity Growth (Real VA per AHW and Real VA per Worker) of Selected Advanced Economies (CAGR), 2009-2019



Source: OECD, DOS, MTI Staff Estimates

Given its stronger productivity growth over the decade, Singapore narrowed its productivity gap in level terms with other advanced economies. Between 2009 and 2019, Singapore's productivity level, in terms of VA per AHW, improved from 31 per cent to 46 per cent that of Switzerland, the frontier economy (Exhibit 3). Similarly, in terms of VA per worker, Singapore's productivity level rose from 53 per cent of Switzerland's level in 2009 to 63 per cent in 2019 (Exhibit 4). However, while Singapore is progressing in the right direction, there is still much room for Singapore to improve compared to the economies at or close to the frontier.

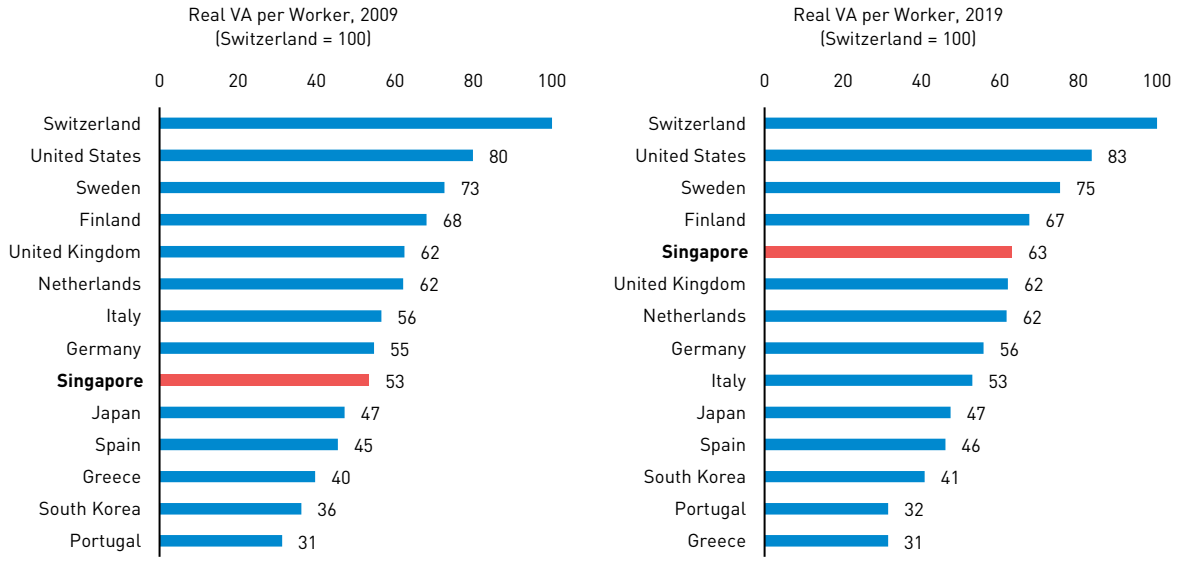
Exhibit 3: International Comparisons of Real VA per AHW, 2009 and 2019



Source: MTI Staff Estimates, OECD
Notes:

1. The comparisons are based on real GDP data at constant 2015 prices and converted to a common currency based on average market exchange rates from 2014 to 2016.
2. In the OECD, productivity is measured in terms of VA per hour worked.
3. 2018 figures are used for Switzerland and South Korea because the 2019 figures are not yet available.

Exhibit 4: International Comparisons of Real VA per Worker, 2009 and 2019



Source: MTI Staff Estimates, OECD
Note: The comparisons are based on real GDP data at constant 2015 prices and converted to a common currency based on average market exchange rates from 2014 to 2016.

Singapore's progress in raising aggregate productivity over the past decade is aligned with the aims of the ESC and the Committee on the Future Economy (CFE) to uplift productivity to support economic growth and higher wages for Singaporeans. To better understand the drivers of productivity growth over the decade, shift-share and growth accounting analyses are conducted, with a focus on decomposing productivity growth as measured by real VA per AHW. The next two sections describe the methodology and results of the two decomposition analyses.

3. SHIFT-SHARE ANALYSIS OF LABOUR PRODUCTIVITY GROWTH

Previous shift-share analyses (see Goh, 2014; Goh & Fan, 2015; Fan & Teo, 2016; Teo & Ong, 2018) found that Singapore's productivity growth was largely driven by productivity improvements within sectors. This section updates the earlier analyses and examines Singapore's productivity performance over the period of 2009 to 2019.

Methodology

Using shift-share decomposition, overall labour productivity (VA per AHW) growth in the economy can be expressed as a sum of three effects:

- Within Effect: The contribution of productivity growth within sectors to overall productivity growth;
- Static Shift Effect: The contribution of changes in the AHW shares of sectors with *different productivity levels* to overall productivity growth; and
- Dynamic Shift Effect: The contribution of changes in the AHW shares of sectors with *different productivity growth rates* to overall productivity growth.

In equation form, this can be represented as:

$$\frac{P_t - P_{t-1}}{P_{t-1}} = \sum_{i=1}^{n}\left[\left(\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}\right) \times \frac{Y_{i,t-1}}{Y_{t-1}}\right] + \sum_{i=1}^{n}\left[\frac{P_{i,t-1}}{P_{t-1}} \times \left(\frac{H_{i,t}}{H_t} - \frac{H_{i,t-1}}{H_{t-1}}\right)\right] + \sum_{i=1}^{n}\left[\left(\frac{P_{i,t} - P_{i,t-1}}{P_{t-1}}\right) \times \left(\frac{H_{i,t}}{H_t} - \frac{H_{i,t-1}}{H_{t-1}}\right)\right]$$

where P_t is the productivity level (VA per AHW) of the economy in period t;
$Y_t = \sum_{i=1}^{n} Y_{i,t}$ is the total VA of the economy in period t;
$H_t = \sum_{i=1}^{n} H_{i,t}$ is the total AHW of the economy in period t; and
$i = 1,..., n$ is the i^{th} sector in the economy.

Decomposition of Overall Labour Productivity Growth

Singapore's labour productivity (VA per AHW) grew by 2.8 per cent per annum from 2009 to 2019. Overall productivity growth over this period was supported by higher productivity growth within the various sectors (i.e., positive Within Effect), but was dampened by a slight increase in the AHW shares of less productive sectors relative to more productive sectors (i.e., negative Static Shift Effect):[3,4]

- Within Effect: The Within Effect was the strongest driver of productivity growth, with productivity gains in the various sectors contributing 3.2 percentage-points to overall productivity growth each year.

- Static Shift Effect: There was a small shift in AHW from more productive sectors to less productive sectors, which dampened overall productivity growth slightly by 0.3 percentage-point each year.

- Dynamic Shift Effect: This effect was negative and negligible (-0.04 percentage-point each year) over the decade.

Contribution from Within Effect

The Within Effect dominated productivity growth dynamics from 2009 to 2019. Our key observations for this period are as follows:

- The Within Effect was supported by productivity growth in all sectors, except for Professional Services[5] (Exhibit 5). In particular, strong productivity improvements were posted by outward-oriented sectors such as Manufacturing (6.5 per cent per annum), Finance & Insurance (4.2 per cent per annum) and Wholesale Trade (4.0 per cent per annum), as well as the domestically-oriented Administrative & Support Services[6] sector (6.0 per cent per annum).[7] Collectively, these four sectors contributed 2.8 percentage-points each year to overall productivity growth from 2009 to 2019. The contribution by each of the remaining sectors was generally positive though small (less than 0.15 percentage-point each year).

- On aggregate, productivity gains in outward-oriented sectors (4.0 per cent per annum) outpaced that in domestically-oriented sectors (1.7 per cent per annum) from 2009 to 2019. In general, outward-oriented sectors are more productive than domestically-oriented ones because firms in these sectors have a strong incentive to improve their products and services, and transform and upgrade their processes, in order to remain competitive in global markets.

3 *The Within Effect, Static Shift Effect and Dynamic Shift Effect do not sum up to overall productivity growth because (i) the contributions of ownership of dwellings and taxes on products are excluded, and (ii) there is non-additivity of sectors as a result of the chain-linking of VA.*

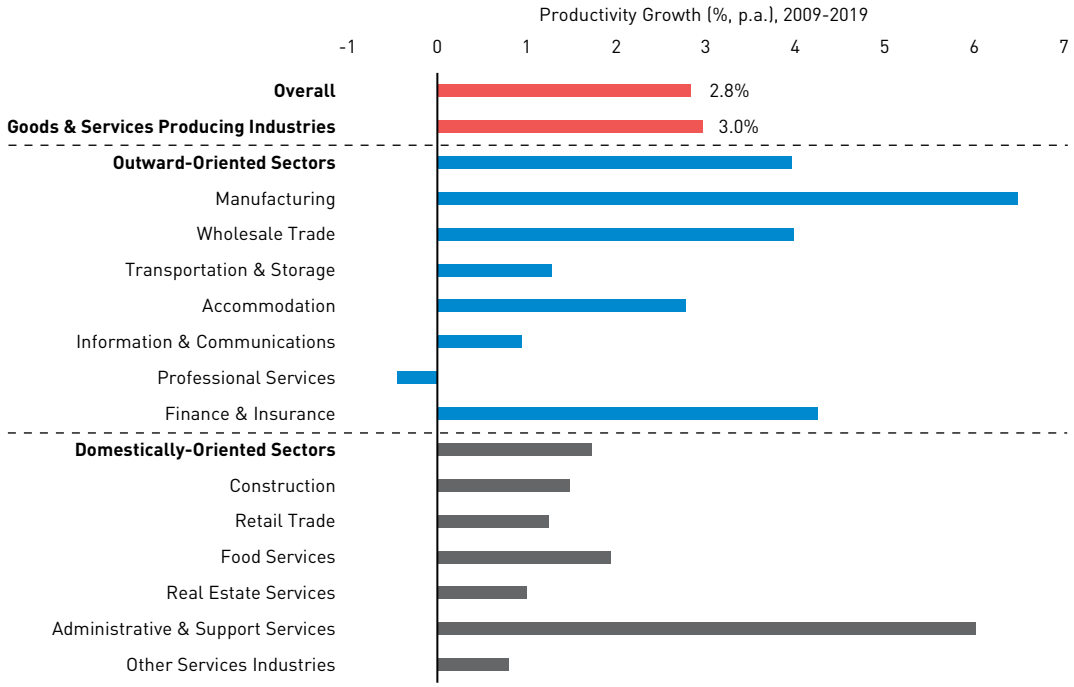
4 *The results of the shift-share decomposition excluding the rebound year of 2010 following the GFC are similar. Between 2010 and 2019, overall productivity (VA per AHW) rose by 2.2 per cent per annum, and was driven primarily by a strong Within Effect (+2.5 percentage-points each year). The Static Shift Effect remained small and negative (-0.3 percentage-point each year), while the Dynamic Shift Effect continued to be negligible (-0.03 percentage-point each year).*

5 *Between 2009 and 2019, productivity growth in the Professional Services sector was weighed down by strong employment growth (3.9 per cent per annum), which outpaced VA growth (3.0 per cent per annum). In turn, the strong employment growth was led by employment gains in the Activities of Head Offices and Management Consultancy Activities segment (5.8 per cent per annum). Nonetheless, there are signs that the sector's productivity growth has improved over time. In the second half of the decade (i.e., 2014 to 2019), VA per AHW in the Professional Services sector increased by 2.0 per cent per annum, reversing the 2.9 per cent per annum decline in the first half of the decade (i.e., 2009 to 2014).*

6 *The strong productivity performance of the Administrative & Support Services sector was supported by the rental and leasing segment (comprising the leasing of non-financial intangible assets, and the rental and leasing of motor vehicles, equipment and other tangible goods).*

7 *The classification of a sector as outward- or domestically-oriented is determined by the direct and indirect export share of the sector's total output as estimated using Input-Output tables and tourism receipts. Outward-oriented sectors include the Manufacturing, Wholesale Trade, Transportation & Storage, Accommodation, Information & Communications, Finance & Insurance and Professional Services sectors. Domestically-oriented sectors include the Construction, Retail Trade, Food Services, Real Estate Services, Administrative & Support Services and Other Services Industries sectors.*

Exhibit 5: Average Sectoral Productivity Growth, 2009-2019



Source: MTI Staff Estimates

Contribution from Static Shift Effect

From 2009 to 2019, overall productivity growth was dampened slightly by a net increase in the AHW shares of less productive domestically-oriented sectors compared to that of more productive outward-oriented sectors (Exhibit 6). The changes in AHW shares over the period were largely due to changes in employment shares across sectors. Our main observations for the period are as follows:

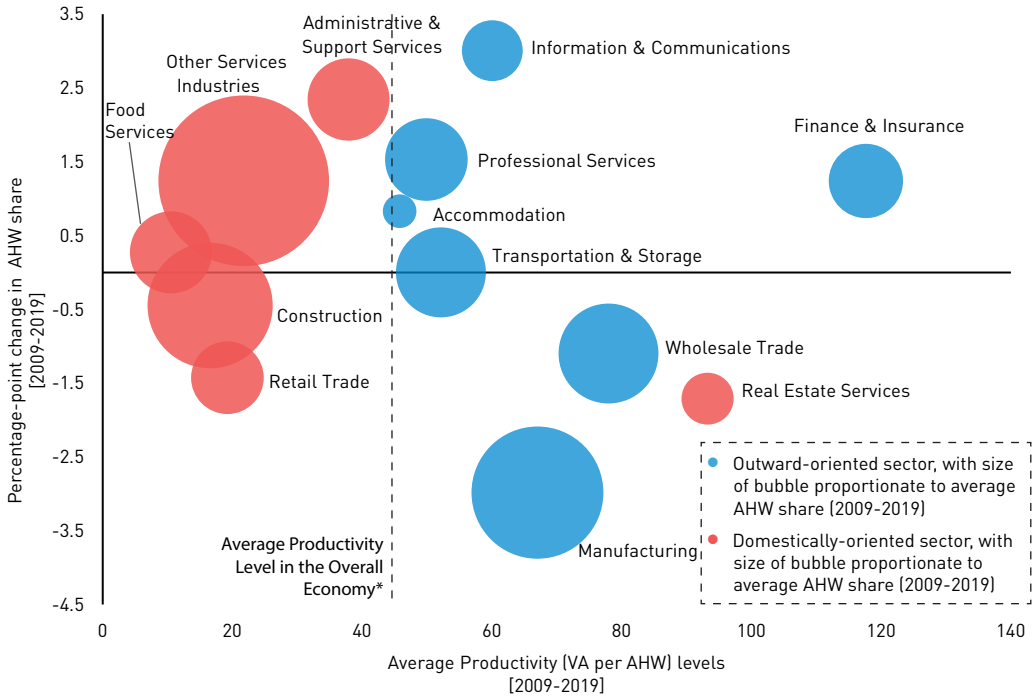
- Among the outward-oriented sectors, which had higher productivity levels than the overall economy average, the Manufacturing and Wholesale Trade[8] sectors saw a decline in their AHW shares, driven by a fall in their employment shares. On the other hand, the Information & Communications, Professional Services, Finance & Insurance and Accommodation experienced an increase in their AHW shares on the back of a rise in their employment shares. As the latter was not large enough to offset the former, the overall AHW share of the outward-oriented sectors fell over the period.

- Among the domestically-oriented sectors, which tended to be less productive than the overall economy, the Other Services Industries[9], Administrative & Support Services and Food Services sectors posted an increase in AHW shares, even as the Construction[10] and Retail Trade sectors saw a decline in their AHW shares. On net, the AHW shares of domestically-oriented sectors that were less productive than the overall economy rose over the period.[11]

- Taken together, the net decline in the AHW shares of more productive outward-oriented sectors, coupled with the net increase in the AHW shares of less productive domestically-oriented sectors, contributed to a small negative Static Shift Effect of -0.3 percentage-point per year over the period of 2009 to 2019. However, a closer examination of the Static Share Effect shows that it was driven by the trends in the earlier years of the decade (i.e., 2009-2016), with the effect turning positive in the later years (i.e., 2016-2019) as more productive outward-oriented services sectors such as Finance & Insurance and Information & Communications continued to gain AHW and employment shares.

8 Although employment in the Wholesale Trade sector rose between 2009 and 2019, the gains were insufficient to offset the employment growth in other sectors of the economy, thus resulting in a decline in its employment share.
9 The Other Services Industries expanded its employment on the back of increased demand for education, health and social services.
10 In line with weaker construction activity, foreign employment in the Construction sector fell by 3.8 per cent per annum between 2016 and 2019.
11 The only domestically-oriented sector that was more productive than the overall economy was the Real Estate Services sector. As the sector saw a decline in its AHW share over the period, it also weighed on overall productivity growth.

Exhibit 6: Change in AHW Share vs Average Productivity Levels by Sector, 2009-2019



Source: MTI Staff Estimates
*This excludes ownership of dwellings and taxes on products

Summary

Consistent with previous shift-share analyses for earlier periods, Singapore's overall labour productivity growth over the past decade was supported by productivity growth within sectors, especially the outward-oriented sectors, even as it remained weighed down by a small negative Static Shift Effect caused by a net shift in AHW and employment shares away from more productive outward-oriented sectors towards less productive domestically-oriented ones. There are, however, signs that the Static Shift Effect has improved over time, with the effect turning positive in the later years of the decade.

4. GROWTH ACCOUNTING ANALYSIS OF LABOUR PRODUCTIVITY GROWTH

Capital intensity and labour quality are important drivers of labour productivity growth. The influence of these factors on productivity can be examined by decomposing overall labour productivity growth into improvements in capital intensity, labour quality and TFP using a growth accounting approach:

- Capital Intensity: Capital intensity refers to the amount of machinery, equipment, intellectual property and infrastructure each unit of labour input uses for production. An increase in capital intensity can raise productivity by equipping workers with more capital to work with in the production process.

- Labour Quality: A more skilled workforce increases productivity because better-trained workers have a greater capacity to be efficient and innovative, and to produce higher-VA products and services.

- TFP: TFP captures the residual output growth that is not attributed to changes in the quantity and quality of capital and labour inputs. It measures how efficiently capital and labour are used together in the production process, and encompasses a wide range of factors, including technological progress, improvements in management practices and organisational structures, and the diffusion of technology across firms.

Previous analyses by Goh and Fan (2015) and Fan and Teo (2016) found that improvements in both capital intensity and labour quality supported overall labour productivity growth in earlier periods.

Methodology

Using a growth accounting approach, VA per AHW growth between 2009 and 2019 (i.e., 2.8 per cent per annum) can be decomposed into the contributions from changes in capital intensity, labour quality and TFP. Specifically, the economy is modelled using a Cobb-Douglas production function with constant returns to scale:

$$Y = A \prod_i H_i^{b_i} \prod_j K_j^{c_j}$$

where Y = real output;
A = Total Factor Productivity (TFP);
H_i = AHW of i^{th} type of labour;
b_i = share of output of the i^{th} type of labour;
K_j = net stock of j^{th} type of capita
c_j = share of output of j^{th} type of capital; and
$\sum_i b_i + \sum_j c_j = 1$ (i.e., constant returns to scale).

Given that $\Delta Y \approx \sum_i \Delta b_i \Delta H_i + \sum_j c_j \Delta K_j + \Delta A$ under the assumption that inputs are paid their marginal products in competitive markets, productivity growth can be decomposed into three components – (i) contribution from changes in labour quality, (ii) contribution from changes in capital intensity, and (iii) contribution from TFP:

$$\Delta \frac{Y}{H} \approx S_L \times \sum_i (s_i - h_i) \Delta H_i + \sum_j c_j \left(\Delta \frac{K_j}{H}\right) + \Delta A$$

where S_L = total wage share of output;
s_i = wage share of i^{th} type of labour;
h_i = AHW share of i^{th} type of labour.

For the purpose of the decomposition analysis, labour is divided into skilled and less-skilled labour based broadly on their occupation types.[12] The quality of each type of labour is proxied by the term $(s_i - h_i)$, which is positive when labour type i has higher wages than the other labour type. Hence, overall labour quality improves (and productivity increases) when the growth in total hours worked by skilled workers (with wages above the economy average) exceeds that of less-skilled workers (with wages below the economy average).

For capital intensity, the contributions from five types of capital – machinery & equipment, computer software, research & development (R&D), transport equipment[13] and non-residential[14] construction & works – are considered. Capital intensity of each capital type contributes positively to productivity growth when capital growth outpaces hours worked growth (i.e., there is more capital for each man-hour).

12 Broadly, workers who are Professionals, Managers, Executives, and Associate Professionals and Technicians are classified as skilled workers, while workers who are Clerical Support Workers, Service & Sales Workers, Craftsmen & Related Trades Workers, Plant & Machine Operators & Assemblers, and Cleaners, Labourers & Related Workers are classified as less-skilled workers.
13 Transport equipment includes ships & boats, aircrafts and other transport equipment.
14 Residential buildings are excluded because they are not used in the production process of firms. The imputed ownership of dwellings is also excluded from the productivity computations.

Decomposition of Overall Labour Productivity

From 2009 to 2019, capital intensity, labour quality and TFP all contributed positively to productivity growth:[15,16]

- Increases in capital intensity dominated productivity dynamics over this period, contributing an average of 2.2 percentage-points to overall productivity growth each year.
- Labour quality improvements also supported productivity growth, with a contribution of 0.2 percentage-point per year.
- TFP contributed an average of 0.6 percentage-point per year to productivity growth.

Contribution from Capital Intensity and Labour Quality

From 2009 to 2019, all capital types saw an increase in capital intensity, thereby contributing positively to productivity growth (Exhibit 7):

- Non-residential construction & works and R&D capital stock[17] each contributed 0.7 percentage-point per year to productivity improvements. These results are aligned with the Government's investments in public infrastructure (e.g., Mass Rapid Transit lines) and R&D. For instance, to strengthen Singapore's position as an R&D hub, the Government committed S$16 billion over 2011 to 2015 under the Research, Innovation & Enterprise (RIE) 2015 Plan, and S$19 billion over 2016 to 2020 under the RIE 2020 Plan.
- Positive contributions to productivity growth were also observed for machinery & equipment (0.3 percentage-point per year), computer software (0.3 percentage-point per year) and transport equipment (0.2 percentage-point per year).

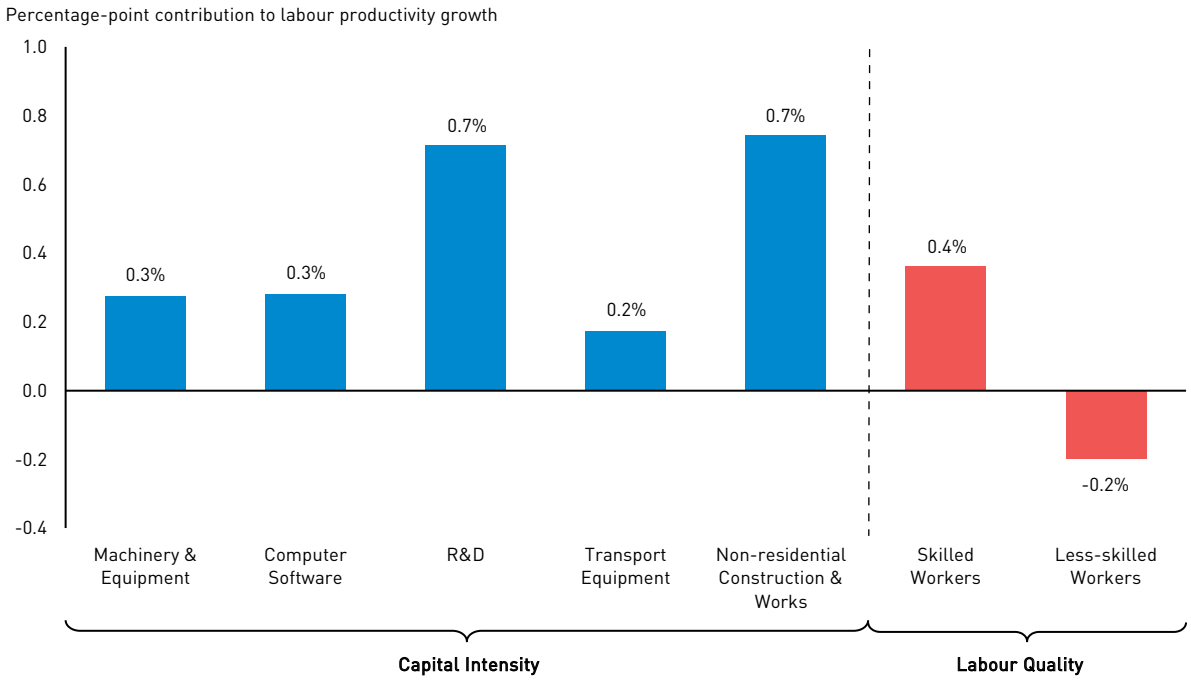
Similarly, labour quality improvements supported productivity growth over this period, with a contribution of 0.2 percentage-point per year. This was driven by a robust increase in hours worked by skilled workers which outpaced that of less-skilled workers (Exhibit 7).

15 *The contributions of capital intensity, labour quality and TFP may not sum to overall productivity growth because ownership of dwellings and taxes on products are excluded in the productivity decomposition. TFP computed in this growth accounting analysis is also not directly comparable to the Multifactor Productivity series released by the Department of Statistics because of differences in the decomposition method used. For instance, this analysis (i) uses total VA for goods and services producing industries instead of GDP, (ii) uses finer categories of capital inputs, (iii) uses hours worked instead of employment as a measure of the quantity of labour inputs, and (iv) takes into account skilled and less-skilled workers.*

16 *Repeating the decomposition analysis for the period of 2010 to 2019 (i.e., excluding the rebound year of 2010), it is found that capital intensity remains the key driver of productivity growth (i.e., 2.2 per cent per annum), contributing 2.4 percentage-points to productivity growth each year. The contribution of labour quality to productivity growth remains the same (0.2 percentage-point each year). By contrast, the TFP contribution to productivity growth moderated to -0.4 percentage-point each year. As TFP is computed as a residual in the decomposition, it is highly sensitive to changes in VA. As such, the slowdown in economic growth in recent years would have contributed to a dampening of TFP growth that more than offset the increase in TFP recorded in the earlier years.*

17 *An earlier MTI study found positive returns from investing in R&D, with a 1 per cent increase in R&D stock in a firm leading to a 0.135 per cent increase in productivity on average (see Teo et al., 2019).*

Exhibit 7: Contribution of Capital Intensity and Labour Quality to Labour Productivity Growth, 2009-2019



Source: MTI Staff Estimates

Summary

Based on growth accounting analysis, this study finds that overall labour productivity growth between 2009 and 2019 was driven primarily by an increase in capital intensity. All capital types contributed positively to productivity growth, with non-residential construction & works and R&D capital stock supported by Government investments over the years. Labour quality improvements also contributed to productivity growth, as the increase in hours worked by skilled workers outpaced that of less-skilled workers. Likewise, TFP contributed positively to productivity growth for the decade as a whole.

5. CONCLUSION

Singapore's labour productivity (VA per AHW) grew strongly by 2.8 per cent per annum between 2009 to 2019, achieving the 2 to 3 per cent per annum growth target set by the ESC. Over the decade, Singapore's productivity growth performance exceeded that of most advanced economies. Using shift-share analysis, overall productivity growth over this period was found to be driven by within-sector productivity improvements, especially in the outward-oriented sectors. While productivity growth over the decade was weighed down slightly by a net shift in AHW and employment shares from more productive sectors towards less productive ones, there are signs that this shift effect has improved over time. Supplementing the shift-share analysis with growth accounting analysis, overall labour productivity growth was found to be supported by improvements in capital intensity, labour quality and TFP between 2009 and 2019.

Our strong labour productivity performance over the past decade can be attributed in large part to our economic restructuring efforts, which aim to raise productivity and transform our industries through innovation and internationalisation, as well as national initiatives such as SkillsFuture, which aims to upskill our workers and support lifelong learning. In addition, Government investments in R&D through the RIE Plans, as well as Government support (e.g., Productivity Solutions Grant and SMEs Go Digital programme) to encourage firms to adopt productivity and digitalisation solutions, have helped to build up the capital stock in the economy.

To achieve sustained productivity gains over the longer term so that Singapore can remain globally competitive and Singaporeans can enjoy higher wages, it is imperative for us to press on with our industry transformation and restructuring efforts to bring about productivity improvements across all sectors, especially the domestically-oriented ones, and restructure the economy towards more productive sectors. In line with this, the Government will continue to help firms to invest in innovation, automation and technology, as well as equip Singaporeans with the skills to enter productive growth sectors.

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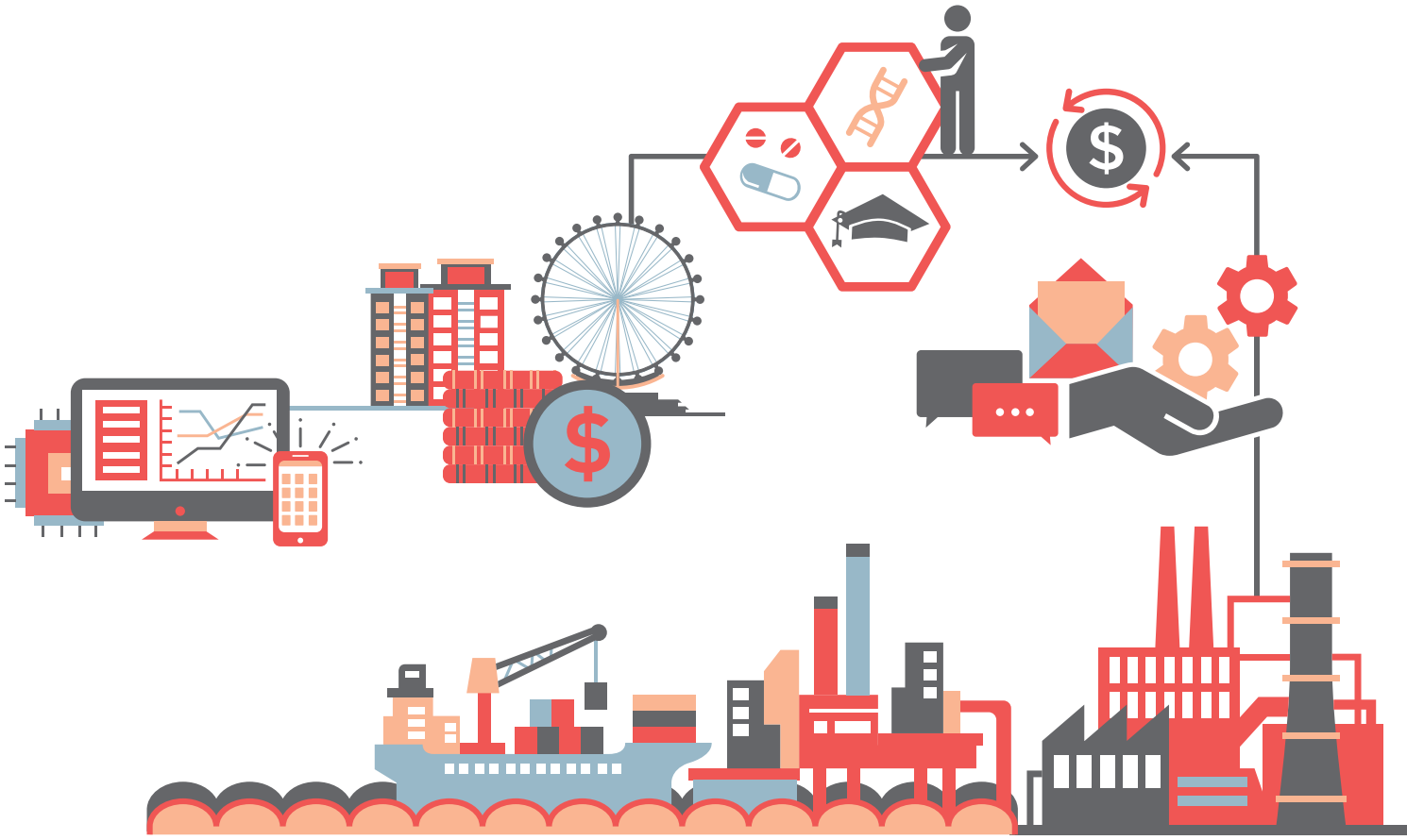

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