ECONOMIC SURVEY OF SINGAPORE

First Quarter 2016

MTI MINISTRY OF TRADE AND INDUSTRY SINGAPORE

May 2016

Ministry of Trade and Industry
Republic of Singapore

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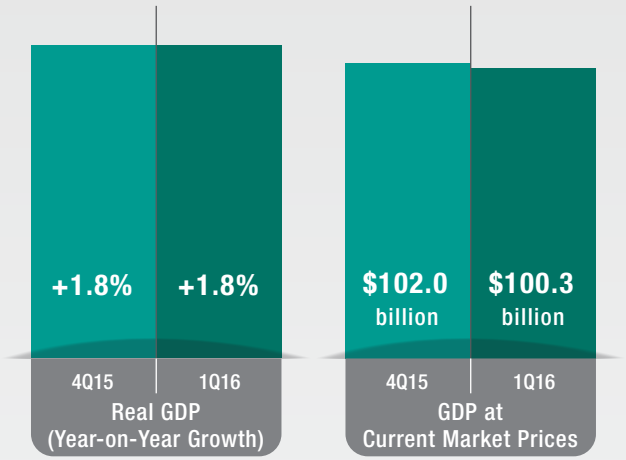
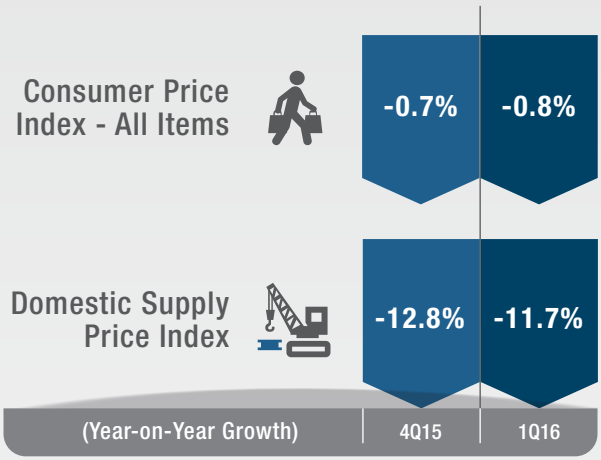
MAIN INDICATORS OF THE SINGAPORE ECONOMY

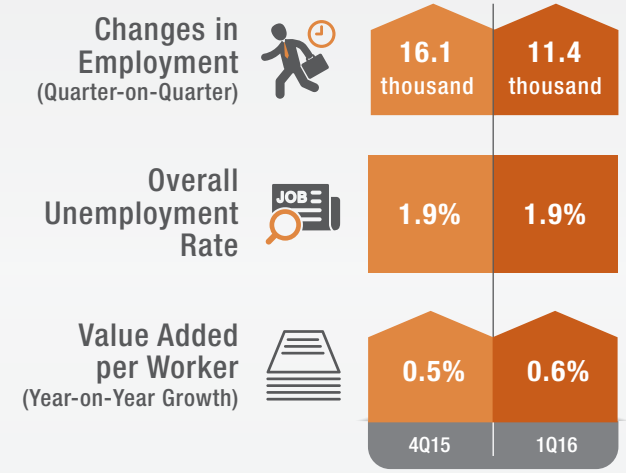
OVERALL ECONOMY



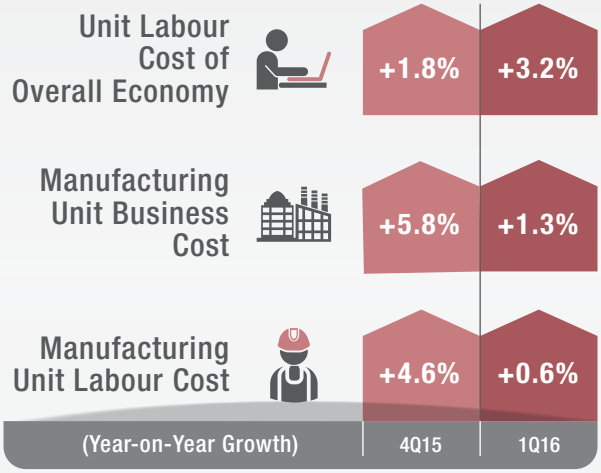
PRICES



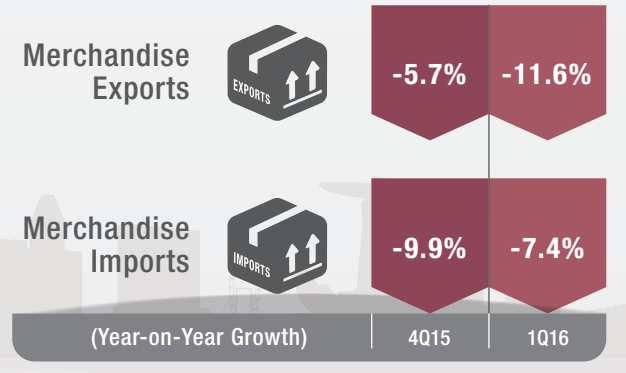
LABOUR MARKET



COSTS



MERCHANDISE TRADE



SERVICES TRADE

CHAPTER 1
Economic Performance

CHAPTER 1

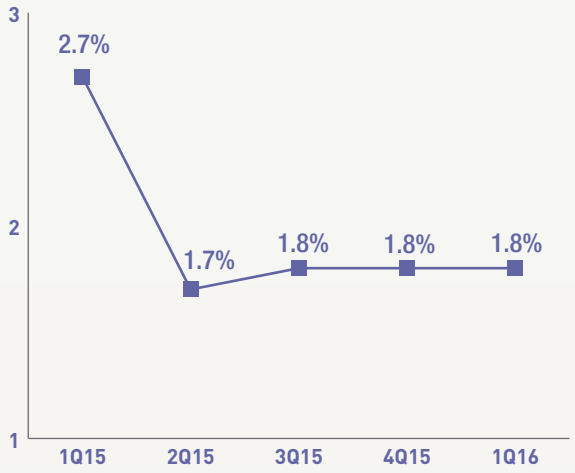
THE SINGAPORE ECONOMY

ECONOMIC PERFORMANCE

Real GDP grew by

1.8% in 1Q16

Quarterly Growth (Year-on-Year)



Main Drivers of Growth in 1Q16

WHOLESALE & RETAIL TRADE

0.3%-point contribution

FINANCE & INSURANCE

0.3%-point contribution

CONSTRUCTION

0.3%-point contribution

In total, these sectors accounted for

0.9%-points of GDP growth

LABOUR MARKET

RESIDENT UNEMPLOYMENT RATE

2.7% in 1Q16

EMPLOYMENT (Q-O-Q CHANGE)

+11,400 employed

Sectors with the Highest Employment Growth in 1Q16

OTHER SERVICES INDUSTRIES	FINANCIAL & INSURANCE	CONSTRUCTION
+8,600 employed	+2,100 employed	+1,600 employed

PRODUCTIVITY

VALUE ADDED PER WORKER

+0.6%

Sectors with the highest Value Added per Worker Growth in 1Q16

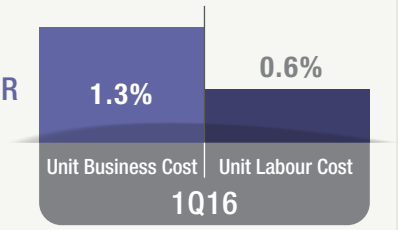
CONSTRUCTION	WHOLESALE & RETAIL TRADE	MANUFACTURING
+3.7%	+3.3%	+2.8%

COSTS

Overall Unit Labour Cost grew by

3.2% in 1Q16

WITHIN THE MANUFACTURING SECTOR

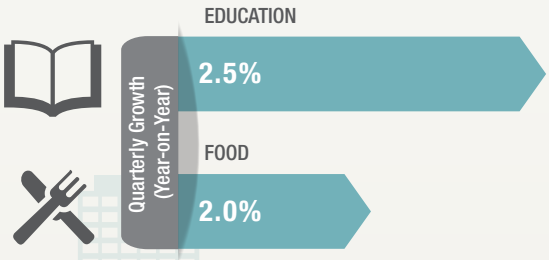


PRICES

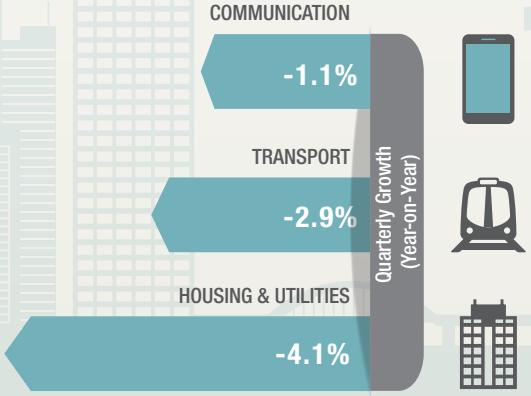
The Consumer Price Index (CPI) declined by

0.8% in 1Q16

CATEGORIES WITH PRICE INCREASES



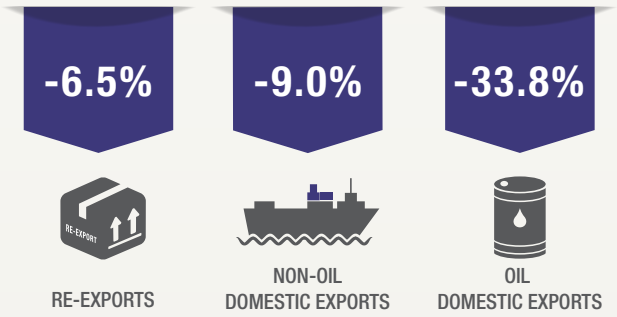
CATEGORIES WITH PRICE DECLINES



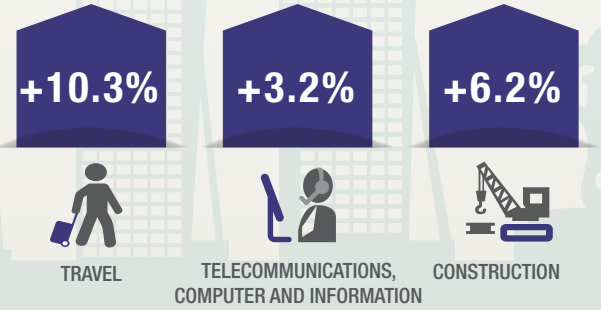
INTERNATIONAL TRADE

Total Merchandise Exports declined by

11.6% in 1Q16



Main Drivers of Services Export Growth were...



OVERVIEW

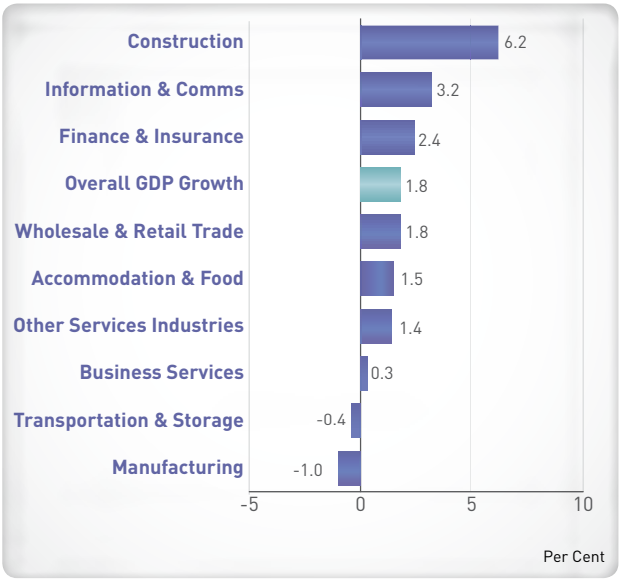
In the first quarter of 2016,

- The economy expanded by 1.8 per cent compared to the same period last year, with contributions to growth led by the wholesale & retail trade, finance & insurance and construction sectors.
- The overall unemployment rate remained low at 1.9 per cent, unchanged from the fourth quarter of 2015. While total redundancies were lower than that in the preceding quarter, the number was higher than a year ago, amidst on-going business restructuring.
- Total employment increased by 11,400 on a quarter-on-quarter basis, supported by employment growth in the services and construction sectors. However, this was lower than the seasonally-high employment growth of 16,100 in the previous quarter.
- The Consumer Price Index (CPI) declined by 0.8 per cent on a year-on-year basis.

OVERALL PERFORMANCE

The economy grew by 1.8 per cent year-on-year in the first quarter, unchanged from the fourth quarter of 2015 (Exhibit 1.1). On a quarter-on-quarter seasonally-adjusted annualised basis, the economy expanded by 0.2 per cent, slower than the 6.2 per cent growth in the previous quarter.

Exhibit 1.1: GDP and Sectoral Growth Rates in 1Q 2016



The manufacturing sector contracted by 1.0 per cent, extending the 6.7 per cent contraction in the preceding quarter. The sector was primarily weighed down by declines in the output of the transport engineering and precision engineering clusters.

The services producing industries performed better, growing by 1.4 per cent, although this was slower than the 2.8 per cent growth registered in the fourth quarter of 2015. Within services, all sectors except for the transportation & storage sector registered expansions. The information & communications sector posted the strongest growth of 3.2 per cent, followed by the finance & insurance (2.4 per cent) and wholesale & retail trade (1.8 per cent) sectors. The accommodation & food services, other services and business services sectors also recorded growth of 1.5 per cent, 1.4 per cent and 0.3 per cent respectively. By contrast, the transportation & storage sector contracted by 0.4 per cent, weighed down by the water transport segment.

The construction sector recorded the strongest performance, expanding by 6.2 per cent following the 4.9 per cent growth in the preceding quarter. Growth was supported by public sector construction works and private industrial building works.

The sectors that contributed the most to GDP growth in the first quarter were the wholesale & retail trade, finance & insurance and construction sectors (Exhibit 1.2). Collectively, they accounted for 0.9 percentage-points of overall GDP growth in the quarter.

Exhibit 1.2: Percentage-Point Contribution to Growth in Real GDP in 1Q 2016 (By Industry)

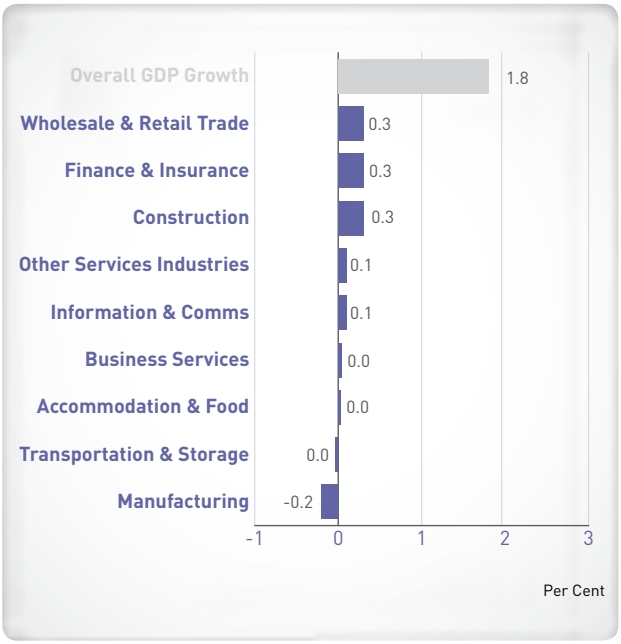


*Exhibit 1.3: Changes in Total Demand**

	2015				2016
	I	II	III	IV	I
Total Demand	1.2	0.8	4.2	1.7	**2.0**
External Demand	4.1	0.4	2.7	2.8	**-0.8**
Total Domestic Demand	-6.5	1.8	8.7	-1.4	**10.0**
Consumption Expenditure	3.5	3.8	6.1	6.3	**3.7**
Public	3.7	1.0	12.2	9.4	**5.9**
Private	3.5	4.5	4.6	5.5	**3.0**
Gross Fixed Capital Formation	-4.2	2.3	-1.6	-0.7	**-0.5**
Changes in Inventories	-5.3	-0.9	3.8	-3.6	**5.1**

* *For inventories, this refers instead to change as percentage of GDP in the previous year.*

SOURCES OF GROWTH

Total demand rose by 2.0 per cent in the first quarter, higher than the 1.7 per cent growth in the fourth quarter of 2015 (Exhibit 1.3). The expansion was driven by domestic demand, which rose by 10 per cent, a sharp rebound from the 1.4 per cent contraction in the preceding quarter. By contrast, external demand fell by 0.8 per cent, reversing the 2.8 per cent growth in the previous quarter.

Domestic demand was driven mainly by changes in inventories, which rose by 5.1 per cent. Consumption expenditure also supported the increase in domestic demand, rising by 3.7 per cent on the back of both public and private consumption growth.

By contrast, gross fixed capital formation contracted by 0.5 per cent, weighed down by a decline in private investments. Specifically, private investments fell by 3.2 per cent, extending the 3.9 per cent decline in the preceding quarter. On the other hand, public investments registered strong growth of 9.6 per cent, following the 14 per cent growth in the previous quarter.

LABOUR MARKET

Unemployment and Redundancy[1]

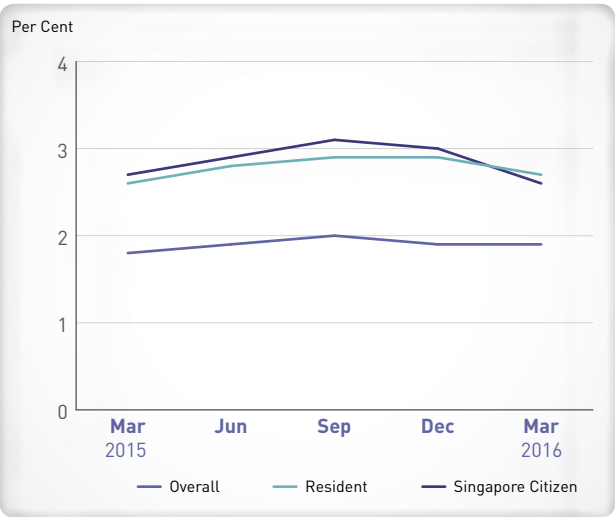
The seasonally-adjusted overall unemployment rate remained low at 1.9 per cent in March 2016, unchanged from that in December 2015 (Exhibit 1.4). The resident and citizen unemployment rates declined, from 2.9 per cent to 2.7 per cent, and from 3.0 per cent to 2.6 per cent respectively. This was largely due to a fall in the labour force participation rate of youths aged 15 to 24.

In March 2016, an estimated 60,400 residents, including 50,800 Singapore citizens, were unemployed. These were lower than the 64,600 and 57,900 respectively in December 2015.[2]

[1] *Figures pertain to private sector establishments with at least 25 employees and the public sector.*

[2] *Based on seasonally-adjusted data on the number of unemployed persons.*

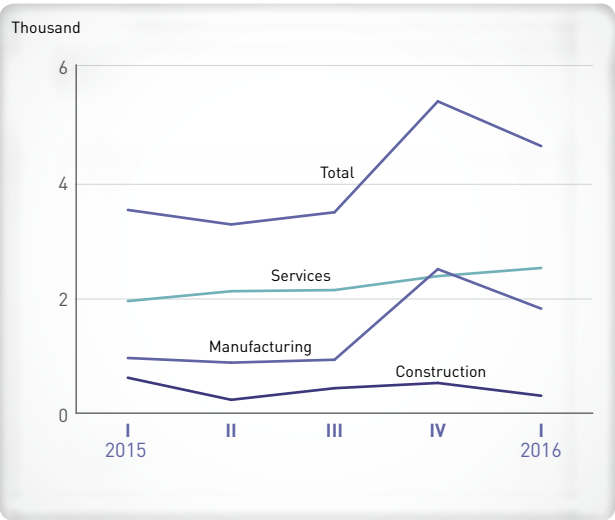
Exhibit 1.4: Unemployment Rate (Seasonally Adjusted)



The number of workers made redundant in the first quarter was 4,600, which was lower than the 5,370 in the preceding quarter. However, it was higher than the number made redundant a year ago (3,500) amidst on-going business restructuring (Exhibit 1.5).

Across broad sectors, redundancies fell in the manufacturing (from 2,480 to 1,800) and construction (from 520 to 300) sectors on a quarter-on-quarter basis. These declines offset the marginal increase in redundancies in the services sector (from 2,360 to 2,500).

Exhibit 1.5: Total Redundancies

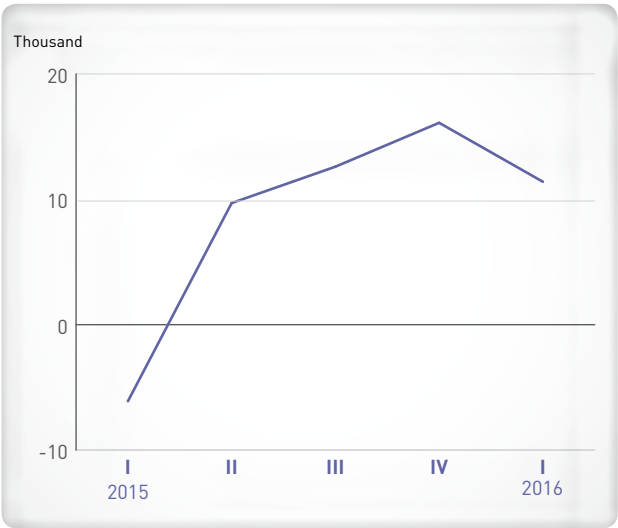


Employment[3]

Total employment increased by 11,400 on a quarter-on-quarter basis in the first quarter, lower than the seasonally-high growth of 16,100 in the fourth quarter of 2015. However, it also represented a reversal from the employment decline of 6,100 in the first quarter of 2015 (Exhibit 1.6).

The increase in employment in the first quarter brought the total number of employed persons in March 2016 to 3,667,600, 1.4 per cent higher when compared to the same period a year ago. The rate of increase over the year was faster than that in December 2015 (0.9 per cent).

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

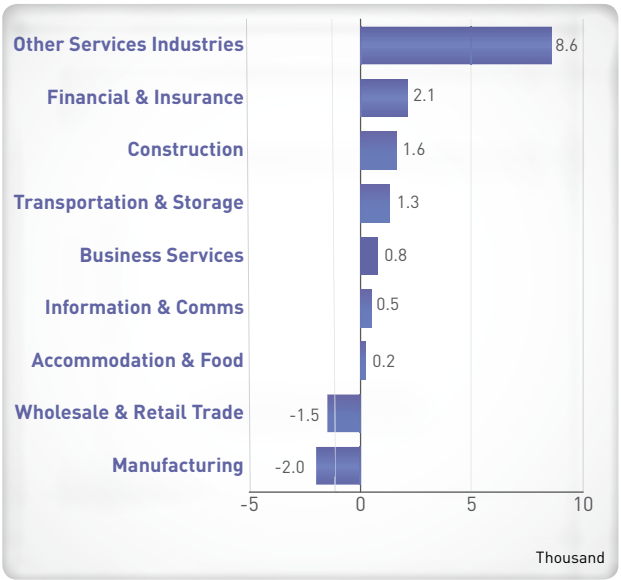


At the sectoral level, manufacturing employment contracted for the sixth consecutive quarter (-2,000), weighed down by continued weak performance of the transport engineering and precision engineering clusters, which had been adversely affected by low oil prices (Exhibit 1.7).

By contrast, construction employment increased by 1,600, higher than the increase in the preceding quarter (900), supported by expansions in public and private sector construction activities. Services employment also increased by 11,900, albeit at a slower pace compared to the previous quarter (21,500), following the end of seasonal festivities. The wholesale & retail trade sector was the only services sector that registered a decline in employment (-1,500), due to seasonal hiring patterns in the retail trade segment and continued weakness in trade-related activities. Nonetheless, this decline was more than offset by employment gains in the other services (8,600), and financial & insurance (2,100) sectors. The strong employment growth in the other services sector was supported by segments such as health & social services.

[3] *Based on preliminary estimates.*

Exhibit 1.7: Change in Employment by Industry in 1Q 2016



Hiring Expectations

Reflecting the weak external outlook for the manufacturing sector, manufacturers remained cautious in their hiring plans. A net weighted balance of 12 per cent of manufacturers expected to hire fewer workers in the second quarter of 2016 as compared to the first quarter. The negative hiring expectations for the sector were primarily driven by the oil-related clusters. In particular, in the marine & offshore engineering cluster, a net weighted balance of 46 per cent of firms expected lower levels of hiring.

Hiring expectations in the services sector were also muted, with a net weighted balance of 2 per cent of services firms expecting to reduce hiring in the second quarter of 2016. Against the backdrop of a weaker trade outlook, firms in the transport & storage industry were the most pessimistic in their employment outlook. A net weighted balance of 17 per cent of firms in this sector expected to reduce hiring in the second quarter.

COMPETITIVENESS

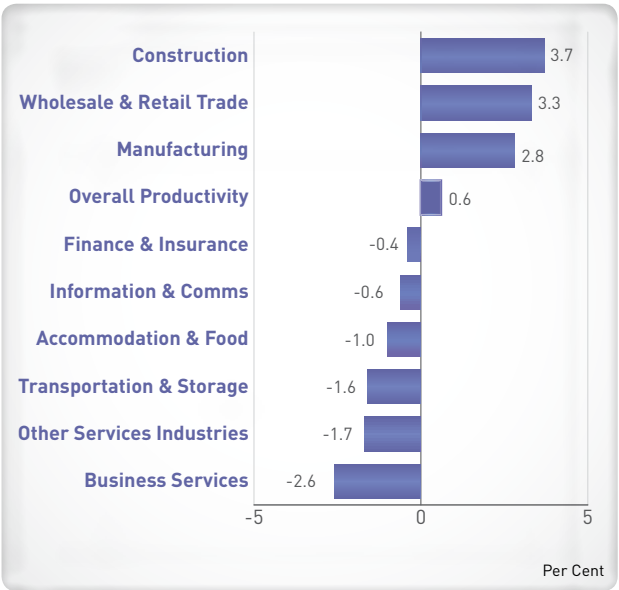
Productivity

Overall labour productivity, as measured by value-added per worker, improved by 0.6 per cent in the first quarter compared to the same period a year ago (Exhibit 1.8).

The construction (3.7 per cent), wholesale & retail trade (3.3 per cent) and manufacturing (2.8 per cent) sectors registered the highest productivity growth rates. By contrast, the business services (-2.6 per cent), other services (-1.7 per cent) and transportation & storage (-1.6 per cent) sectors saw the most marked declines in productivity.

Outward-oriented sectors as a whole achieved higher productivity growth than domestically-oriented sectors. Compared to the same period last year, the productivity of outward-oriented sectors grew by 1.5 per cent in the first quarter, while that of domestically-oriented sectors decreased by 0.9 per cent.[4]

Exhibit 1.8: Changes in Value Added per Worker for the Overall Economy and Sectors in 1Q 2016



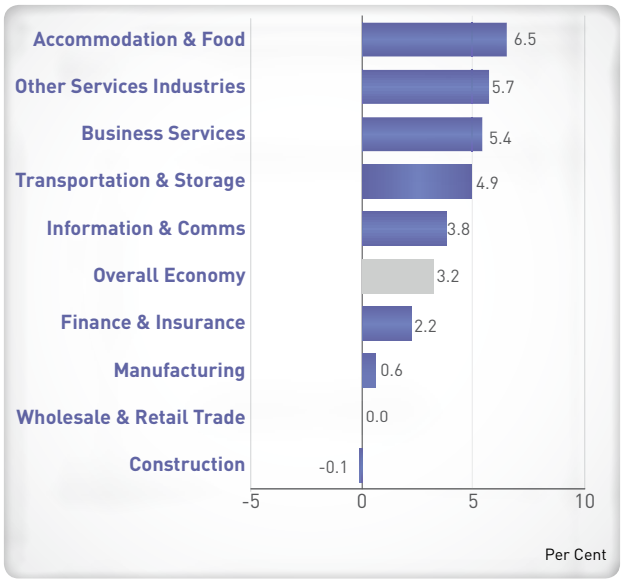
[4] *Based on MTI estimates. Outward-oriented sectors refer to manufacturing, wholesale trade, transportation & storage, accommodation, information & communications, and finance & insurance. Domestically-oriented sectors refer to construction, retail trade, food & beverage services, business services and other services industries.*

Unit Labour Cost and Unit Business Cost

Overall unit labour cost (ULC) for the economy rose by 3.2 per cent in the first quarter, faster than the 1.8 per cent increase in the fourth quarter of 2015 (Exhibit 1.9). The increase in overall ULC was due to an increase in total labour cost per worker which outpaced labour productivity gains.

Manufacturing ULC rose by 0.6 per cent in the first quarter, lower than the 4.6 per cent increase in the preceding quarter. The moderation in manufacturing ULC growth came on the back of stronger productivity growth in the sector. Services ULC also increased by 3.9 per cent in the first quarter, as most services industries registered positive ULC growth. Notably, the ULC for the accommodation & food services sector rose by 6.5 per cent, driven by a rise in total labour cost. By contrast, construction ULC fell by 0.1 per cent, a reversal from the 0.7 per cent increase in the previous quarter, as the sector registered stronger productivity gains.

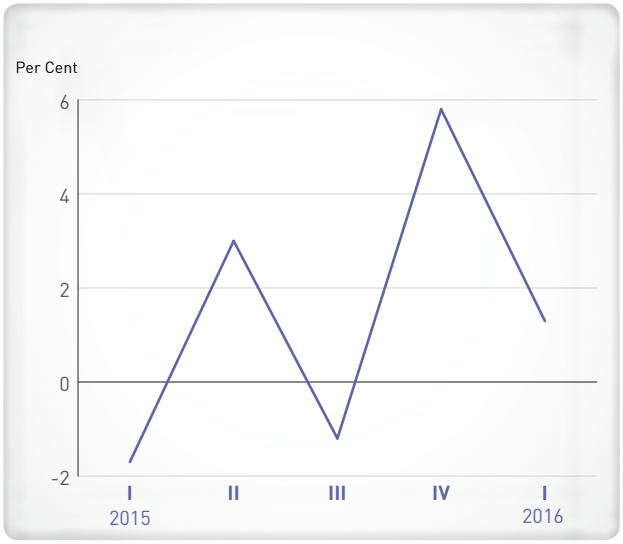
Exhibit 1.9: Changes in Unit Labour Cost



Unit business cost (UBC) in the manufacturing sector rose by 1.3 per cent in the first quarter, lower than the 5.8 per cent increase in the previous quarter (Exhibit 1.10).

The smaller rise in manufacturing UBC was mainly due to a moderation in unit labour cost and unit services cost increases in the sector.

Exhibit 1.10: Changes in Unit Business Cost for Manufacturing

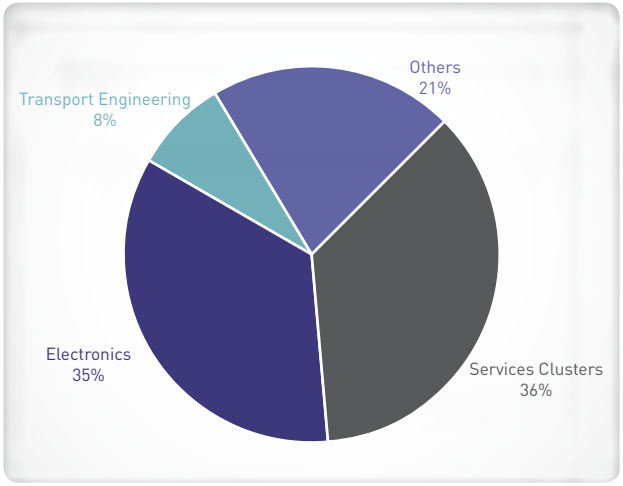


Investment Commitments

Investment commitments in terms of total fixed asset investments (FAI) and total business expenditure (TBE) amounted to $3.0 billion and $2.3 billion respectively in the first quarter (Exhibit 1.11 and Exhibit 1.12).

In terms of FAI, the largest contribution came from the services cluster, which garnered $1.1 billion in commitments. This was followed by the electronics cluster, which attracted $1.0 billion in commitments, mainly from the semiconductors segment. Investors from the Asia Pacific region (ex-Japan) were the biggest foreign contributor to FAI, accounting for $1.2 billion (40 per cent) of total FAI commitments.

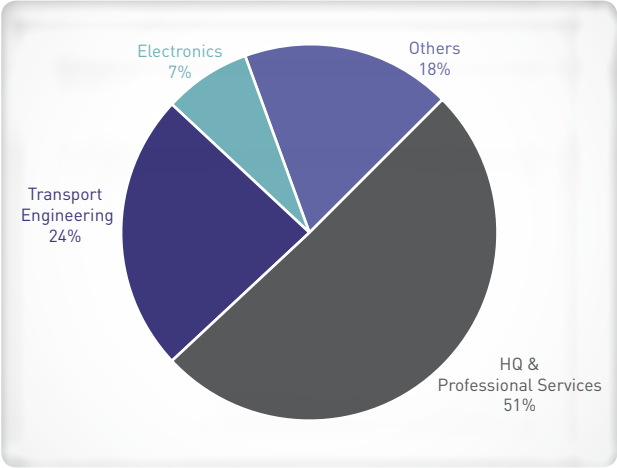
Exhibit 1.11: Fixed Asset Investments by Industry Cluster in 1Q 2016



In terms of TBE, the headquarters & professional services cluster attracted the highest amount of commitments, at $1.2 billion, followed by the transport engineering cluster with $0.6 billion. Similarly, investors from Asia Pacific (ex-Japan) were the largest foreign source of TBE, accounting for $0.6 billion (26 per cent) of total TBE commitments.

When fully realised, these commitments are expected to generate value-added of $3.9 billion and more than 6,200 jobs.

Exhibit 1.12: Total Business Spending by Industry Cluster in 1Q 2016

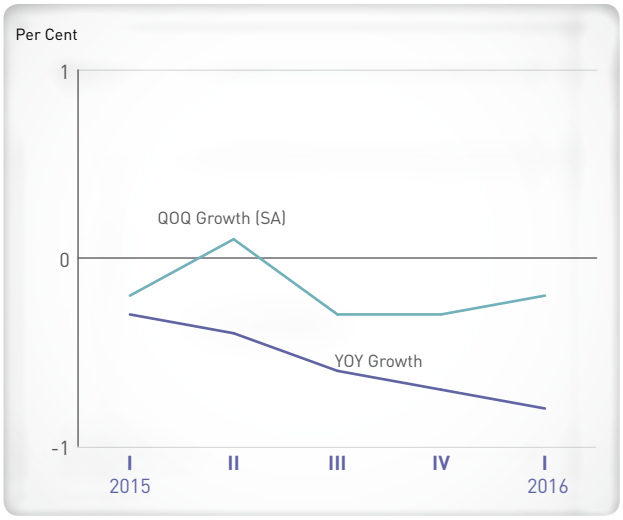


PRICES

Consumer Price Index

The Consumer Price Index (CPI) fell by 0.8 per cent on a year-on-year basis in the first quarter, extending the 0.7 per cent decline in the previous quarter (Exhibit 1.13). On a quarter-on-quarter seasonally-adjusted basis, the CPI declined by 0.2 per cent, following the 0.3 per cent decline in the preceding quarter.

Exhibit 1.13: Changes in CPI



Among the CPI categories, food was the largest positive contributor to CPI inflation in the first quarter, with prices rising by 2.0 per cent on a year-on-year basis (Exhibit 1.14). This was due to price increases for restaurant meals and hawker food, as well as non-cooked food items such as fish & seafood and meat.

Education costs increased by 2.5 per cent as a result of higher fees at commercial institutions, universities, polytechnics, childcare centres, kindergartens and playgroups, which more than offset the effect of the waiver of national examination fees for Singaporeans. Prices of clothing rose by 2.1 per cent on account of more expensive ready-made garments and footwear.

Healthcare costs increased by 0.7 per cent as the higher cost of outpatient services outweighed the fall in the prices of hospital services as well as medical products, appliances & equipment. Recreation & culture costs rose by 0.4 per cent, owing to the higher costs of holiday travel and newspapers which more than offset the fall in the prices of cinema tickets. The prices of miscellaneous goods & services increased by 0.5 per cent due to the higher prices of personal effects and personal care items.

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

					Per Cent
	2015				2016
	I	II	III	IV	I
All items	-0.3	-0.4	-0.6	-0.7	**-0.8**
Food	2.3	1.9	1.8	1.7	**2.0**
Clothing & Footwear	-1.0	-0.6	0.7	1.2	**2.1**
Housing & Utilities	-2.5	-3.8	-3.6	-4.2	**-4.1**
Household Durables & Services	1.6	-0.7	-1.9	-1.4	**-0.8**
Health Care	0.2	-0.3	-0.1	-0.2	**0.7**
Transport	-3.2	0.1	-1.4	-1.2	**-2.9**
Communication	1.6	1.0	-0.6	-0.5	**-1.1**
Recreation & Culture	0.1	-0.1	0.4	0.9	**0.4**
Education	3.4	3.1	3.6	3.7	**2.5**
Miscellaneous Goods & Services	0.8	-0.3	-0.3	-0.4	**0.5**

The price gains in these CPI categories were outweighed by declines in other categories. In particular, housing & utilities posed the largest drag on headline inflation, with prices declining by 4.1 per cent as the fall in accommodation costs and electricity tariffs more than offset the increase in housing maintenance charges. Transport costs declined by 2.9 per cent as lower car prices, road tax and air fares outweighed the effect of higher petrol prices and vehicle repair & maintenance fees.

Communications costs fell by 1.1 per cent due to the lower cost of telecommunication services. The prices of household durables & services dipped by 0.8 per cent as concessionary levies for foreign domestic workers fell by more than the increase in salaries paid to these workers.

INTERNATIONAL TRADE

Merchandise Trade

Singapore's total merchandise trade contracted by 9.7 per cent in the first quarter compared to the same period a year ago, extending the 7.7 per cent decline in the preceding quarter (Exhibit 1.15). The contraction was mainly attributed to the 36 per cent drop in oil merchandise trade.

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

						Per Cent
	2015					2016
	I	II	III	IV	Ann	I
Merchandise Trade	-10.8	-10.9	-8.5	-7.7	-9.5	**-9.7**
Merchandise Exports	-6.0	-9.0	-8.0	-5.7	-7.2	**-11.6**
Domestic Exports	-12.3	-12.2	-14.4	-12.9	-12.9	**-16.8**
Oil	-34.7	-31.3	-32.6	-29.9	-32.2	**-33.8**
Non-Oil	4.0	1.5	-2.2	-3.5	-0.1	**-9.0**
Re-Exports	1.1	-5.6	-0.5	1.4	-0.9	**-6.5**
Merchandise Imports	-16.1	-13.0	-9.1	-9.9	-12.1	**-7.4**
Oil	-44.2	-34.7	-34.1	-40.0	-38.2	**-37.6**
Non-Oil	-2.0	-2.9	2.4	1.2	-0.3	**1.3**

Total merchandise exports fell by 12 per cent in the first quarter, following the 5.7 per cent contraction in the preceding quarter. This marked the seventh consecutive quarter of decline and was largely due to the 17 per cent drop in domestic exports.

The fall in domestic exports was mainly due to oil domestic exports, which posted a sharp decline of 34 per cent in the first quarter. This was in turn attributed to the continued weakness in oil prices, which depressed the nominal value of oil domestic exports. In volume terms, oil domestic exports increased by 1.0 per cent. Non-oil domestic exports (NODX) also contracted by 9.0 per cent, faster than the 3.5 per cent decline in the previous quarter. The decrease in NODX was due to declines in both non-electronic and electronic NODX.

Total merchandise imports contracted by 7.4 per cent in the first quarter, mainly due to the decline in oil imports, which more than offset the increase in non-oil imports. Specifically, oil imports decreased by 38 per cent, as the weakness in oil prices depressed the nominal value of oil imports. In volume terms, oil imports fell marginally by 0.2 per cent. On the other hand, non-oil imports expanded by 1.3 per cent in the first quarter, driven by an increase in both electronic and non-electronic imports.

Services Trade

Total services trade contracted marginally by 0.1 per cent in the first quarter, extending the 0.3 per cent decline in the previous quarter (Exhibit 1.16). Services exports dipped by 0.1 per cent, following the flat growth registered in the preceding quarter. The decline in services exports was mainly due to a fall in financial and insurance services exports. Similarly, services imports fell marginally by 0.1 per cent in the first quarter, weighed down by declines in transport and insurance services imports.

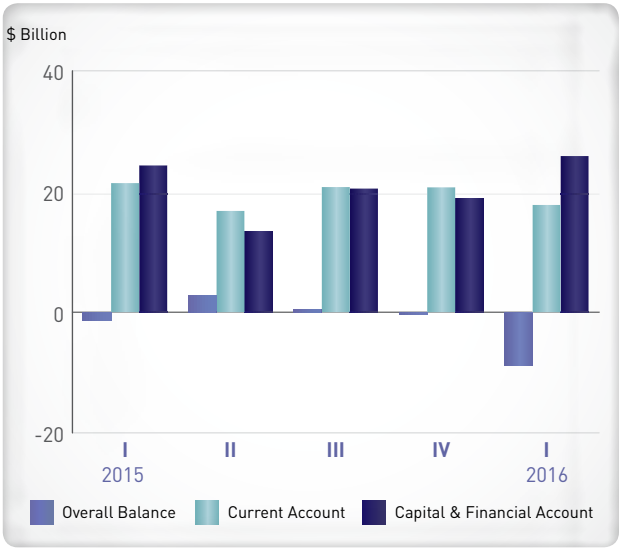
Exhibit 1.16: Growth Rates of Total Services Trade, Services Exports and Services Imports (In Nominal Terms) (In Nominal Terms)

						Per Cent
	2015					2016
	I	II	III	IV	Ann	I
Total Services Trade	0.1	0.2	1.1	-0.3	0.3	**-0.1**
Services Exports	-0.6	1.1	1.4	0.0	0.5	**-0.1**
Services Imports	0.8	-0.6	0.8	-0.5	0.1	**-0.1**

BALANCE OF PAYMENTS

The deficit in the overall balance of payments widened to $8.9 billion in the first quarter, from $0.4 billion in the fourth quarter of 2015. This arose as the surplus in the current account narrowed, while net outflows from the capital and financial account increased.

Exhibit 1.17: Balance of Payments[5]



Current Account

The current account surplus shrank to $18 billion from $21 billion a quarter ago. The surplus in the goods balance narrowed, while the deficit in the services balance widened. Meanwhile, there was a slight decline in the primary income deficit. On the other hand, the secondary income deficit remained largely unchanged.

The surplus in the goods balance fell by $3 billion to $26 billion in the first quarter, as goods exports contracted by more than that of imports.

At the same time, the deficit in the services balance rose by $0.8 billion from the previous quarter to $1.5 billion. Although net receipts from transport services increased while net payments for travel and other business services fell, these were more than offset by the decline in net receipts from financial and maintenance & repair services, as well as the changes from net receipts to net payments for insurance services.

By contrast, the deficit in the primary income balance narrowed from $5.3 billion to $4.4 billion in the first quarter, as the fall in primary income payments exceeded that of receipts.

[5] *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".*

Capital and Financial Account

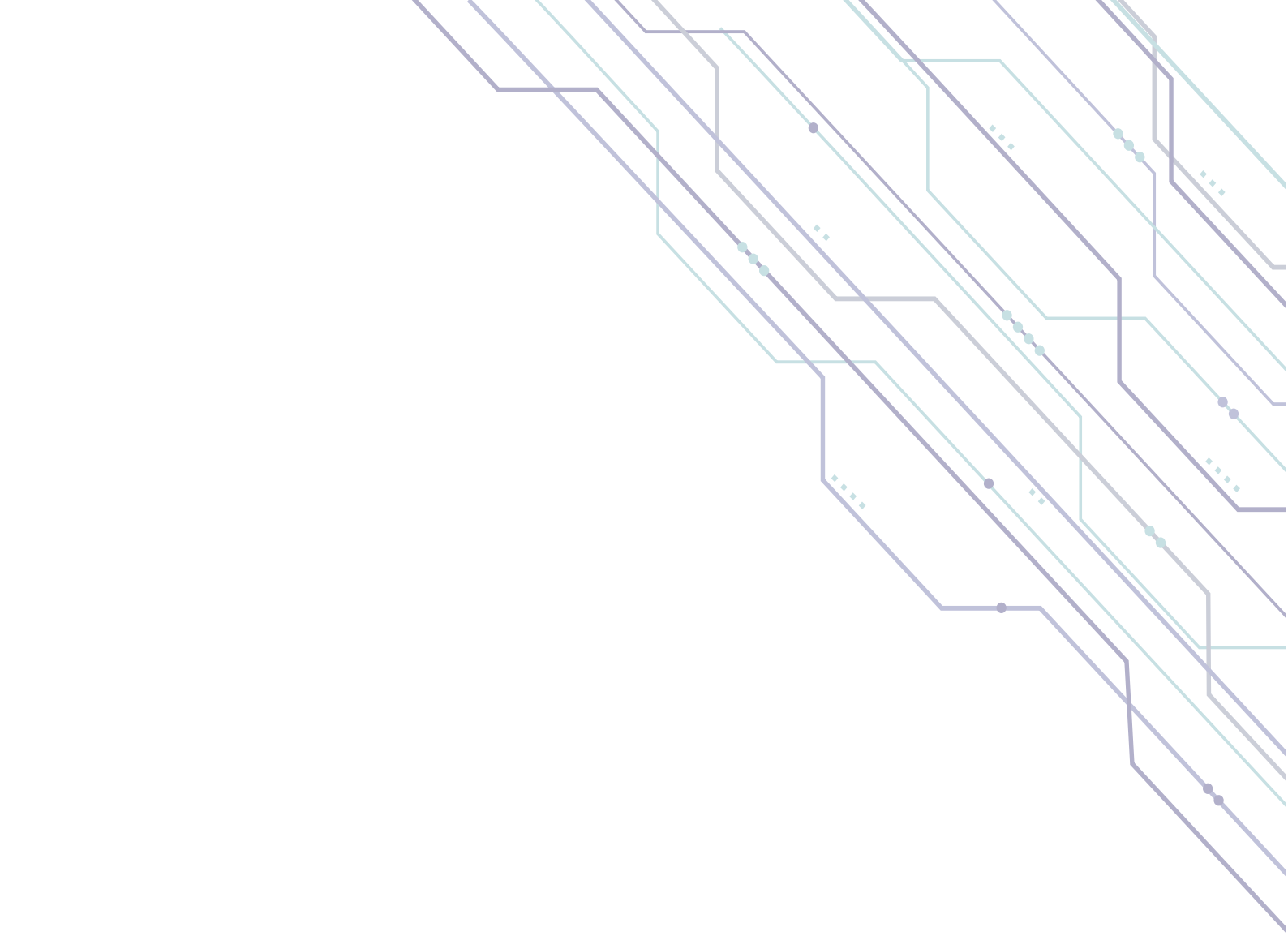
Net outflows from the capital and financial account rose to $26 billion in the first quarter from $19 billion a quarter ago. Net inflows of direct investment decreased while net outflows from the "other investment" account increased significantly. Financial derivatives turned from net inflows to net outflows for the period. Together, these outweighed the effect of the switch from net outflows to net inflows for portfolio investment.

Net inflows of direct investment moderated to $4.6 billion in the first quarter, from $8.7 billion in the previous quarter, as foreign direct investment into Singapore fell and residents' direct investment abroad rose.

At the same time, financial derivatives recorded net outflows of $6.9 billion in the first quarter, reversing the net inflows of $7.0 billion in the fourth quarter of 2015.

Meanwhile, net outflows from the "other investment" account rose by $32 billion to reach $39 billion in the first quarter. This was driven by an increase in net outflows from the domestic non-bank private sector, as well as the reversal from net inflows to net outflows from domestic deposit-taking corporations.

By contrast, the portfolio investment account saw a reversal from net outflows of $28 billion in the fourth quarter of 2015 to net inflows of $15 billion in the first quarter of 2016. Domestic deposit-taking corporations switched from net purchases of foreign securities to net sales. This exceeded the increase in the domestic non-bank private sector's net purchases of securities abroad.



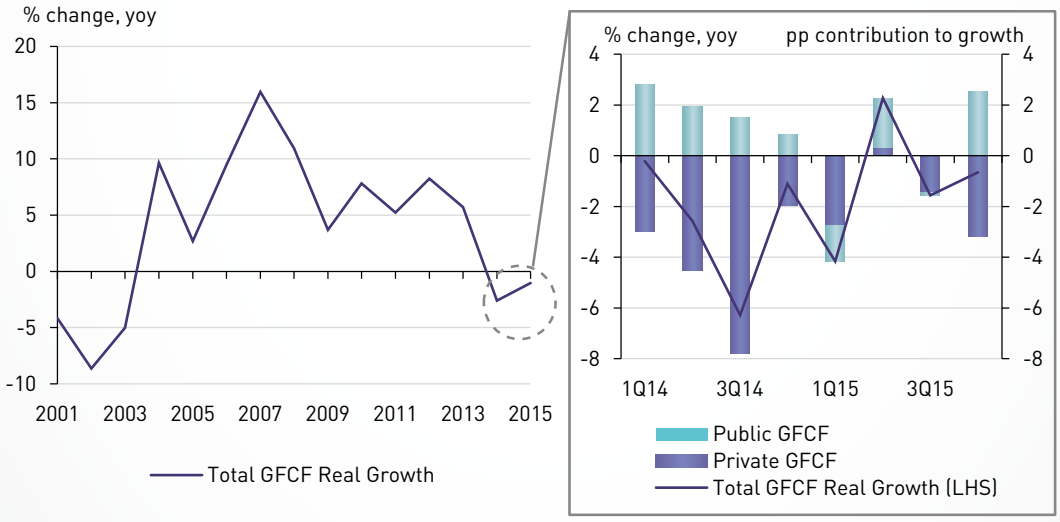
Box 1.1: Recent Trends in Singapore's Real Gross Fixed Capital Formation

This article examines recent trends in Singapore's real gross fixed capital formation (GFCF). We find that the decline in Singapore's real GFCF in 2014 and 2015 was mainly due to a contraction in private GFCF, which could in turn be partly attributed to a decline in private machinery & equipment (M&E) investments. Factors that may explain the decline in private M&E investments include heightened global economic uncertainty, the cyclical downturn in manufacturing, and the shift towards services in the Singapore economy. Using an error correction model, we find that global economic uncertainty was the main contributor to the decline in private M&E investments in Singapore in the last two years, although the latter two factors also contributed to the weakness.

After ten years of growth, real GFCF contracted in 2014 and 2015, mainly due to a decline in private GFCF

Real GFCF contracted by 2.6 per cent and 1.0 per cent in 2014 and 2015 respectively, predominantly due to a fall in private GFCF[1] (Exhibit 1). The weakness in GFCF is of concern for two reasons. First, it weighs on GDP growth in the short-term. Second, a prolonged decline in capital investments would reduce the economy's capital intensity (i.e., capital-labour ratio) and could affect our productivity performance in the longer term.

Exhibit 1: Changes in Real GFCF, 2001 – 2015



Source: Singapore Department of Statistics

[1] *Private GFCF accounts for the bulk of total GFCF. Over the period of 1Q10 to 4Q15, private GFCF accounted for around 80 per cent of total GFCF.*

The decline in private GFCF in the last two years could be attributed to broad-based weakness across all key segments of capital investments

Private GFCF fell by 5.2 per cent and 2.2 per cent in 2014 and 2015 respectively, with weakness seen across all key segments of capital investments (Exhibit 2). A brief analysis of the trends for each segment is as follows:

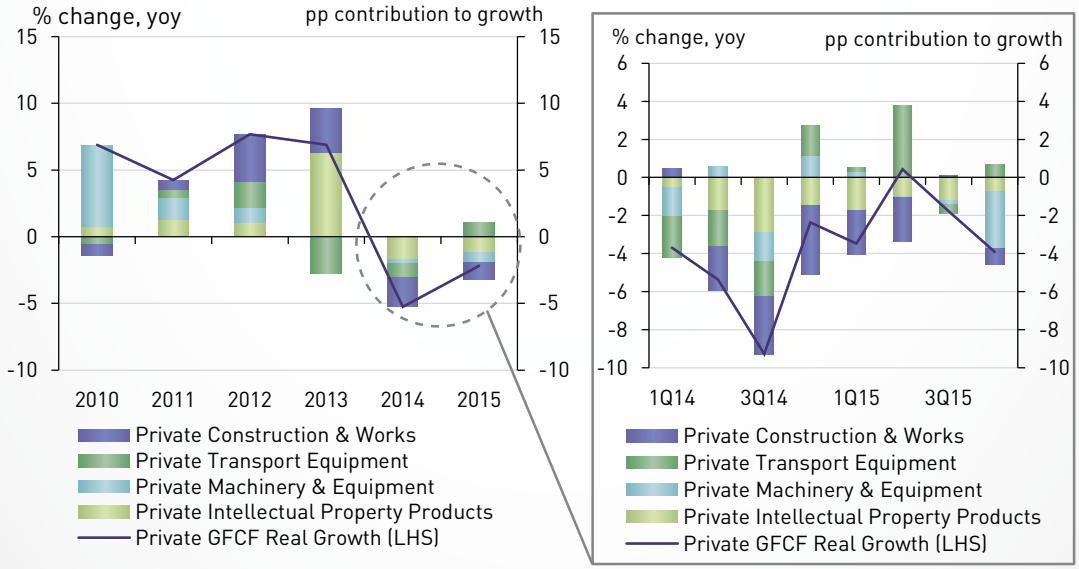
- Private Construction & Works (46 per cent of private GFCF).[2] Investments in private construction & works declined in all quarters of 2014 and 2015, except for 1Q14 and 3Q15. For the whole of 2014 and 2015, investments in private construction & works fell by 4.9 per cent and 2.9 per cent respectively, with the decline due to a fall in investments in both non-residential and residential buildings. The slowdown in investments in residential buildings was in turn in line with the broader weakness in the residential real estate market.

- Private Intellectual Property Products (18 per cent of private GFCF). Investments in private intellectual property products, which include investments in R&D and software, declined by 8.2 per cent and 5.9 per cent in 2014 and 2015 respectively. The decline can be partly attributed to base effects due to the strong outturn in 2013, as well as a slowdown in R&D investments by businesses amidst sluggish economic conditions in recent years.

- Private Transport Equipment (9 per cent of private GFCF). Investments in private transport equipment, which include items like aeroplanes and ships, tend to be lumpy and volatile. In some quarters, investments in private transport equipment saw double-digit negative growth, followed by double-digit positive growth. For the full year, investments in private transport equipment rose by 14 per cent in 2015, reversing the 13 per cent decline in 2014.

- Private Machinery & Equipment (26 per cent of private GFCF). Private M&E investments fell by 1.3 per cent and 2.7 per cent in 2014 and 2015 respectively. As M&E is an important segment of capital investments which would have a direct impact on firms' capital-labour ratio, we focus on explaining the trends in this segment in the subsequent sections.

Exhibit 2: Changes in Real Private GFCF, 2010 – 2015



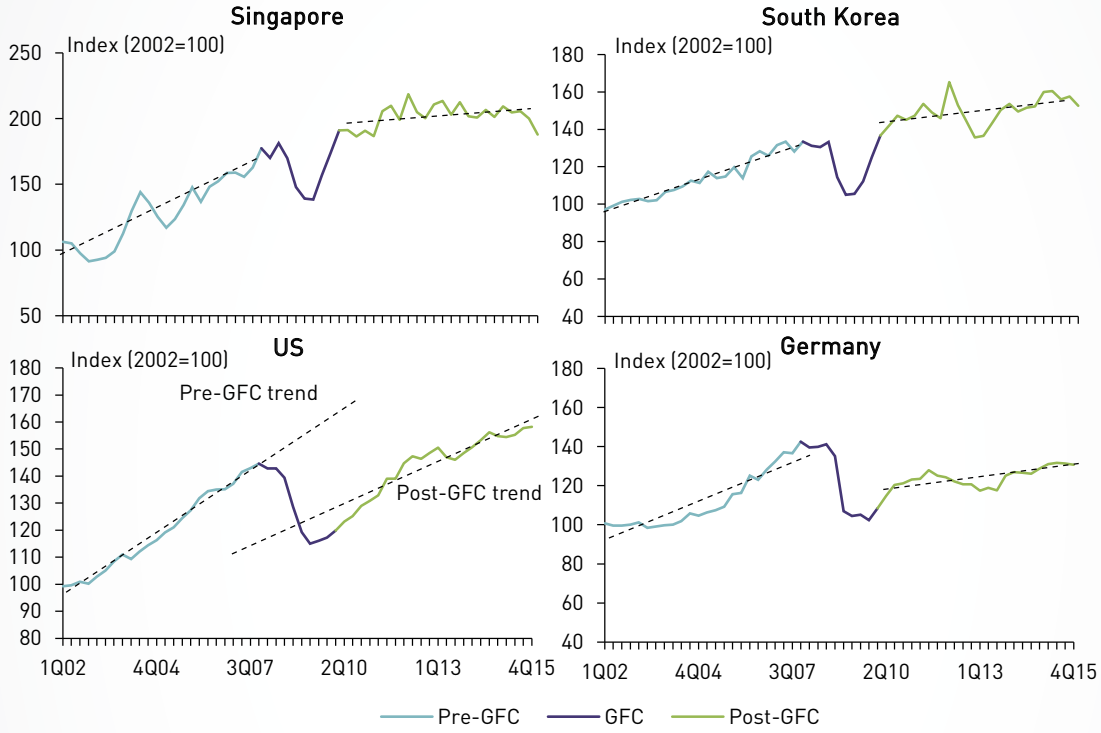
Source: Singapore Department of Statistics

[2] *The shares were taken over the period of 1Q10 to 4Q15.*

Many advanced economies have experienced weakness in private M&E investments in recent years

The weakness in private M&E investments is not unique to Singapore. The IMF (2015) noted that many advanced economies have seen a sharp moderation in private investments since the Global Financial Crisis (GFC). Comparing the post-GFC period with the pre-GFC period, Exhibit 3 shows that private M&E investments have weakened in the post-GFC period in economies such as the US, Germany and South Korea.[3] We next examine the possible factors that could explain the weakness in private M&E investments in Singapore.

Exhibit 3: Private M&E Investments, by Countries, 2002 – 2015



Source: Singapore Department of Statistics, US Bureau of Economic Analysis, CEIC
Notes: Data series for Singapore and South Korea were seasonally-adjusted using the EViews X-13 seasonal adjustment. Private M&E investments data for Germany includes private transport equipment while for South Korea, the data includes public M&E investments.

Singapore's private M&E investments are influenced by global economic uncertainty

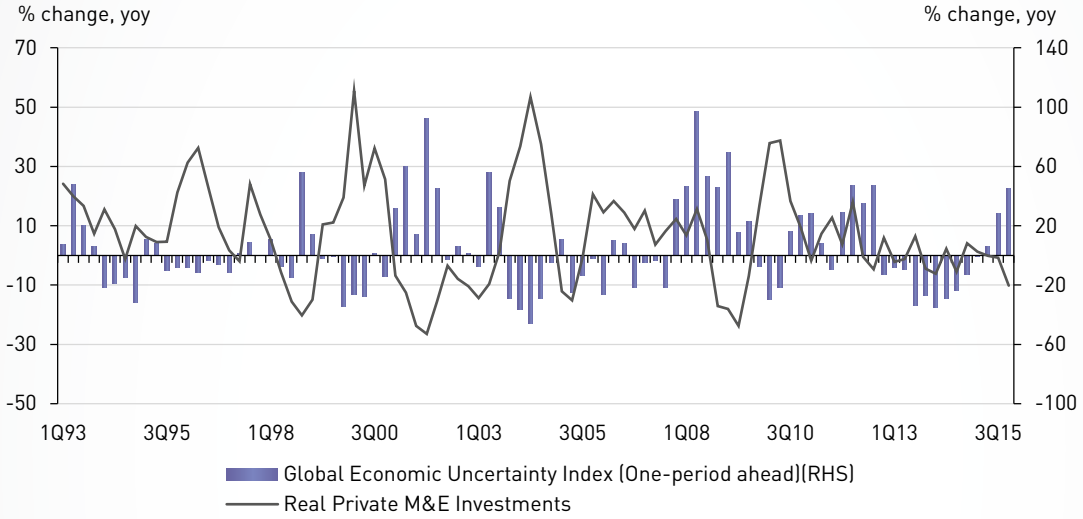
First, we find that Singapore's private M&E investments are influenced by global economic uncertainty. Bernanke (1983) and Dixit and Pindyck (1994) have shown that greater uncertainty generally reduces investments because firms tend to delay their capital investment projects when they are worried and uncertain about future profitability.

[3] While the trend in private M&E investments in the post-GFC period may seem weaker in Singapore when compared to these countries, this could be because Singapore as a small, open economy is more susceptible to the impact of global economic uncertainty. Moreover, there could also be Singapore-specific factors affecting private M&E investments in Singapore, including the shift in the composition of the economy towards services. The rest of the article explores the factors causing the weakness in private M&E investments in Singapore.

In recent years, there has been heightened uncertainty globally arising from the weaker-than-expected global economic performance. This can be seen from the global economic uncertainty index that we have constructed using the existing Economic Policy Uncertainty (EPU) indices developed by Baker, Bloom and Davis (2015) for major economies around the world (Exhibit 4).[4]

In line with the evidence in the economic literature, the increased level of global economic uncertainty could have exerted downward pressures on private M&E investments in Singapore, as well as in advanced economies around the world. Specifically, from Exhibit 4, we observe a negative correlation between the global economic uncertainty index and private M&E investments in Singapore, with an increase in uncertainty associated with a fall in private M&E investments.

Exhibit 4: Global economic uncertainty index and private M&E investments



Source: Singapore Department of Statistics, www.PolicyUncertainty.com, MTI Staff Estimates
Note: The correlation coefficient of the two series is -0.30.

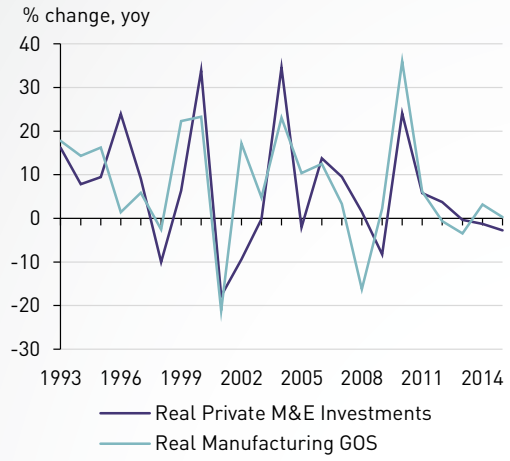
Singapore's private M&E investments are also correlated with the performance of the domestic manufacturing sector

Second, Singapore's private M&E investments are correlated with the performance of the manufacturing sector. As can be seen in Exhibits 5 and 6, private M&E investments correlate positively with profit levels (measured by gross operating surplus or GOS) and the output of the manufacturing sector. As such, the recent weak performance of the manufacturing sector[5] on the back of sluggish global demand would likely have translated into weaker private M&E investments.

[4] We derive the global economic uncertainty index by weighting the EPU indices for the US, Europe, China and Japan. Each of these countries' EPU were indexed to 1995 and then weighted by their share of Singapore's final demand based on the 2011 OECD-WTO Trade in Value-Added (TiVA) database. As the EPU index for China starts from 1995 onwards, we only used the EPU indices for the US, Europe and Japan when constructing the global economic uncertainty index for time periods before 1995.

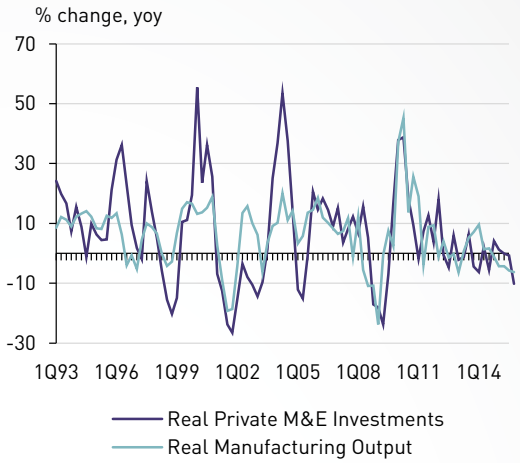
[5] Singapore's manufacturing sector is highly exposed to external demand. Any pullback in external demand will reduce the incentive for manufacturing firms in Singapore to invest in M&E to boost their productive capacity since they now have less orders to fulfil. There are a number of reasons why Singapore is currently experiencing weak external demand for its manufactured goods. First, the global economic recovery has been weaker-than-expected. Second, the Chinese economy is slowing down as it rebalances towards consumption and services-led growth. Third, China has increasingly been in-sourcing the intermediate goods required to produce its manufacturing output.

Exhibit 5: Manufacturing GOS and private M&E investments growth



Source: Singapore Department of Statistics
Note: The correlation coefficient of the two series is 0.65.

Exhibit 6: Manufacturing output and private M&E investments growth



Source: Singapore Department of Statistics
Note: The correlation coefficient of the two series is 0.60.

Finally, the shift towards services in the economy may also explain longer-term trends in Singapore's private M&E investments

Third, over the longer term, the shift towards less capital-intensive services sectors may affect the rate of private investments in M&E. In particular, data from EDB's Census of Manufacturing and DOS' Survey of Services suggest that the amount of capital (excluding land, buildings and structures)[6] needed to generate one unit of real value-added is substantially higher in the manufacturing sector than in the services sector. Since the services sector is less capital intensive, we are likely to see lower capital intensity in the economy as the services' share of the economy increases due to the faster growth of services relative to manufacturing. The lower level of capital intensity in the economy may then translate into slower rates of capital investments, including investments in M&E, over time.

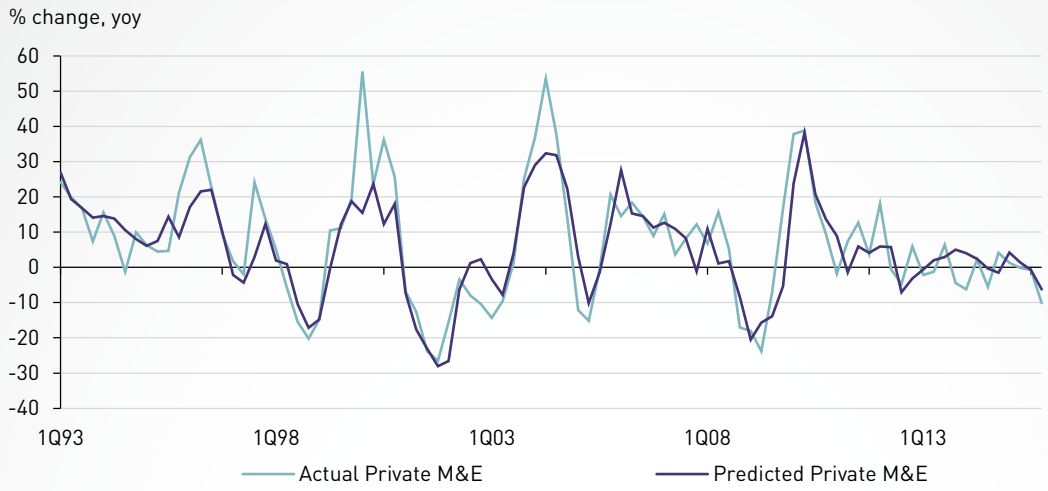
We next estimate an error correction model to quantify the importance of these three factors in explaining the trends in Singapore's private M&E investments

To determine which of the factors highlighted above have had the greatest impact on private M&E investments in Singapore, we estimate an error correction model (ECM) using the global economic uncertainty index, the manufacturing output in Singapore, and the share of manufacturing in the Singapore economy[7] as explanatory variables. The estimated ECM generally fits the data well and is able to explain over 70 per cent of the total variation in private M&E investments over the period of 1993 to 2015 (Exhibit 7). The details of the ECM are in Annex A.

[6] *Capital is measured by net fixed assets excluding land, building & structures.*

[7] *This is used as a proxy for the compositional change in the economy away from manufacturing towards services.*

Exhibit 7: Predicted and actual growth in real private M&E investments, Singapore



Source: Singapore Department of Statistics, MTI Staff Estimates

Based on the results of the ECM, we find that global economic uncertainty was the main contributor to the decline in private M&E investments, although weak manufacturing output and the fall in manufacturing share also played a role

Using the ECM, we decompose the year-on-year growth rates of private M&E investments into the percentage-point (pp) contribution of each of the three factors over different time periods (Exhibit 8). Our key findings for the more recent time periods are summarised below:

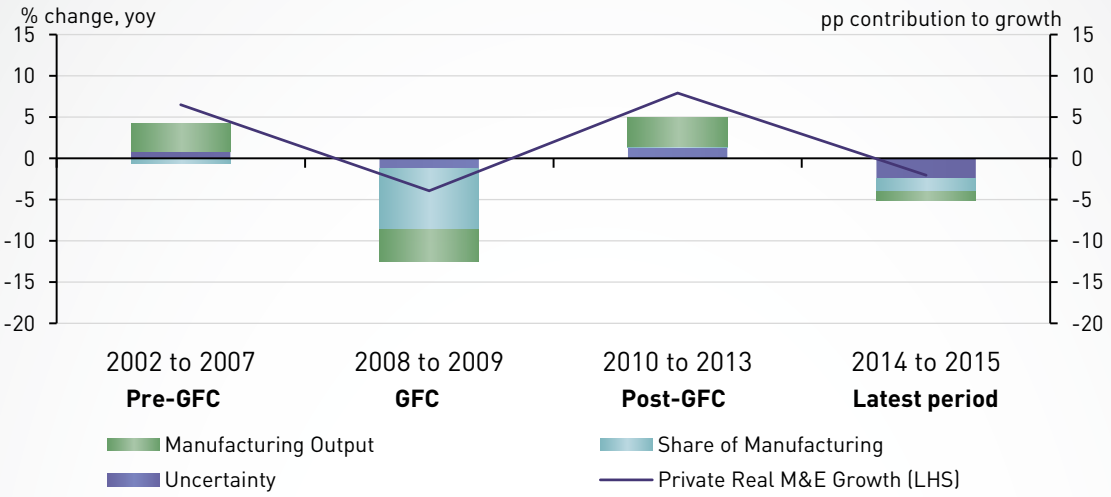
- Pre-GFC, 2002-2007: The robust expansion in manufacturing output was the most important factor driving the growth of private M&E investments. During this period, output in the manufacturing sector expanded by 8.8 per cent on average. Relatively subdued levels of global economic uncertainty also contributed positively to growth in private M&E investments. However, the dip in the manufacturing share of the economy from 26 per cent in 2002 to 25 per cent in 2007, arising from the faster growth of less capital-intensive services sectors, posed a drag on the growth of private M&E investments.

- GFC, 2008-2009: During the GFC, the fall in manufacturing output (-4.2 per cent in both 2008 and 2009) and the share of manufacturing exerted the biggest drag on private M&E investments, leading to an overall decline in private M&E investments. Elevated uncertainty during this period also played a role in the decline of private M&E investments.

- Post-GFC, 2010-2013: The recovery in manufacturing output, especially in 2010, was the most important factor driving the growth of private M&E investments during this period.

- Latest Period, 2014-2015: In the latest period, global economic uncertainty was the biggest contributor to the drop in private M&E investments, accounting for 2.5pp of the decline. The fall in manufacturing output and manufacturing share also contributed to the decline in private M&E investments. While manufacturing output expanded by 2.7 per cent in 2014, this was offset by the 5.1 per cent contraction in 2015, resulting in manufacturing output having a net negative contribution to the growth of private M&E investments during this period. Meanwhile, the manufacturing share of the economy fell from 20 per cent on average between 2010 and 2013 to 19 per cent on average in 2014 and 2015.

Exhibit 8: Decomposition of the drivers of private M&E investments



Source: MTI Staff Estimates

Notes: The growth rates and pp contributions were averaged over all the years within each of the time periods. In the chart, the pp contributions of manufacturing output, share of manufacturing and uncertainty do not sum up to overall private M&E investments growth as we did not include the pp contributions from the residual term from the ECM.

In the near term, private M&E investments are likely to continue to face headwinds due to global economic uncertainty, as well as the sluggish outlook for manufacturing

Our analysis has shown that the recent weakness in private M&E investments is a phenomenon not unique to Singapore. We have identified global economic uncertainty as the main contributor to the decline in Singapore's private M&E investments in 2014 and 2015, although the weak manufacturing output and decline in the manufacturing share of the economy also contributed to the weakness.

Given continued uncertainties in the global economy, as well as the sluggish outlook for the manufacturing sector amidst weak global demand, downward pressures on private M&E investments are likely to remain in the near term.

On its part, the government will continue to help firms automate and invest in productivity-enhancing equipment through the various schemes already in place, such as the Capability Development Grant and the Innovation & Capability Voucher, in order to improve productivity in the economy. By leveraging on these schemes, firms can improve their competitiveness and position themselves for growth when the global economy recovers. At the same time, the government will ensure that the manufacturing sector continues to attract high-value added investments and remain a key pillar of the economy, even as key outward-oriented services sectors continue to expand.

Contributed by:
Economics Division
Ministry of Trade and Industry

Annex A

We first estimate a long-run co-integrating relationship between private M&E investments, manufacturing output, and the share of manufacturing, controlling for the price of M&E.[8]

$$\ln(M\&E)_t = \alpha + \beta_1 \ln(Mfg)_t + \beta_2 \ln(MfgShare)_t + \beta_3 \ln(Price)_t + \theta_t$$

where

$\ln(M\&E)_t$ is the log of real private M&E investments in quarter t

$\ln(Mfg)_t$ is the log of real manufacturing output in quarter t

$\ln(MfgShare)_t$ is the share of manufacturing in the economy in quarter t

$\ln(Price)_t$ is the log of the relative price of private M&E in quarter t

We estimate this long-run relationship using quarterly data from 1Q93 to 4Q15. The coefficients of the regression are reported in Exhibit A1.[9]

Exhibit A1: Coefficient estimates from the long-run co-integrating relationship

Dependent Variable: $\ln(M\&E)_t$	Coefficient
$\ln(Mfg)_t$	0.33**
$\ln(MfgShare)_t$	0.48***
$\ln(Price)_t$	-1.27***
Adjusted R^2	0.92
Period of analysis	1Q93 to 4Q15
Number of observations	92

* p<0.1, ** p<0.05, *** p<0.01

We next model the short-run dynamics using an error correction model (ECM). As uncertainty is likely to play a key role in investment decisions in the short run, we also include the global economic uncertainty index which we had constructed as an explanatory variable to explain the short-run dynamics:

$$\begin{aligned}\Delta\ln(M\&E)_t &= \gamma + \tau_t + \omega\Delta\ln(M\&E)_{t-1} + \delta\Delta\ln(Mfg)_t + \pi\Delta\ln(Uncertainty)_{t-1} \\ &+ \mu[\ln(M\&E)_{t-4} - \alpha - \beta_1\ln(Mfg)_{t-4} - \beta_2\ln(MfgShare)_{t-4} - \beta_3\ln(Price)_{t-4}] + \varepsilon_t\end{aligned}$$

Where

τ_t are quarter dummies

$\Delta\ln(M\&E)_t$ is the year-on-year growth of private M&E investments; in particular, $\Delta\ln(M\&E)_t = \ln(M\&E)_t - \ln(M\&E)_{t-4}$

$\Delta\ln(M\&E)_{t-1}$ is the one quarter lagged year-on-year growth of private M&E investments; in particular, $\Delta\ln(M\&E)_{t-1} = \ln(M\&E)_{t-1} - \ln(M\&E)_{t-5}$

$\Delta\ln(Mfg)_t$ is the year-on-year growth of the manufacturing sector's output

$\Delta\ln(Uncertainty)_{t-1}$ is the one quarter lagged year-on-year change in the global economic uncertainty index which we constructed by weighting existing Economic Policy Uncertainty (EPU) indices for major economies that were developed by Baker, Bloom and Davis (2015)

[8] *This framework is adapted from the accelerator model of investment. See for example, Oliner, Rudebusch, and Sichel (1995), Lee and Rabanal (2010), Barkbu et. al (2015) and IMF (2015).*

[9] *Having estimated the long-run relationship, we used an augmented Dicky-Fuller test on the residuals to check for the presence of unit root. As the test found no evidence of a unit root, this implies that a long-run co-integrating relationship exists.*

The regression results from the ECM show that all the explanatory variables were statistically significant and correctly signed (Exhibit A2). As shown, this model has an R^2 of 0.71 which implies that it can explain over 70 per cent of the movements in private M&E investments.

Exhibit A2: Coefficient estimates from the error correction model

Dependent Variable: $\Delta\ln(M\&E)_t$	Coefficient
$\Delta\ln(M\&E)_{t-1}$	0.42***
$\Delta\ln(Mfg)_t$	0.38***
$\Delta\ln(Uncertainty)_{t-1}$	-0.07*
Error correction term[10]	-0.58***
Adjusted R^2	0.71
Period of analysis	1Q93 to 4Q15
Number of observations	92

* p<0.1, ** p<0.05, *** p<0.01

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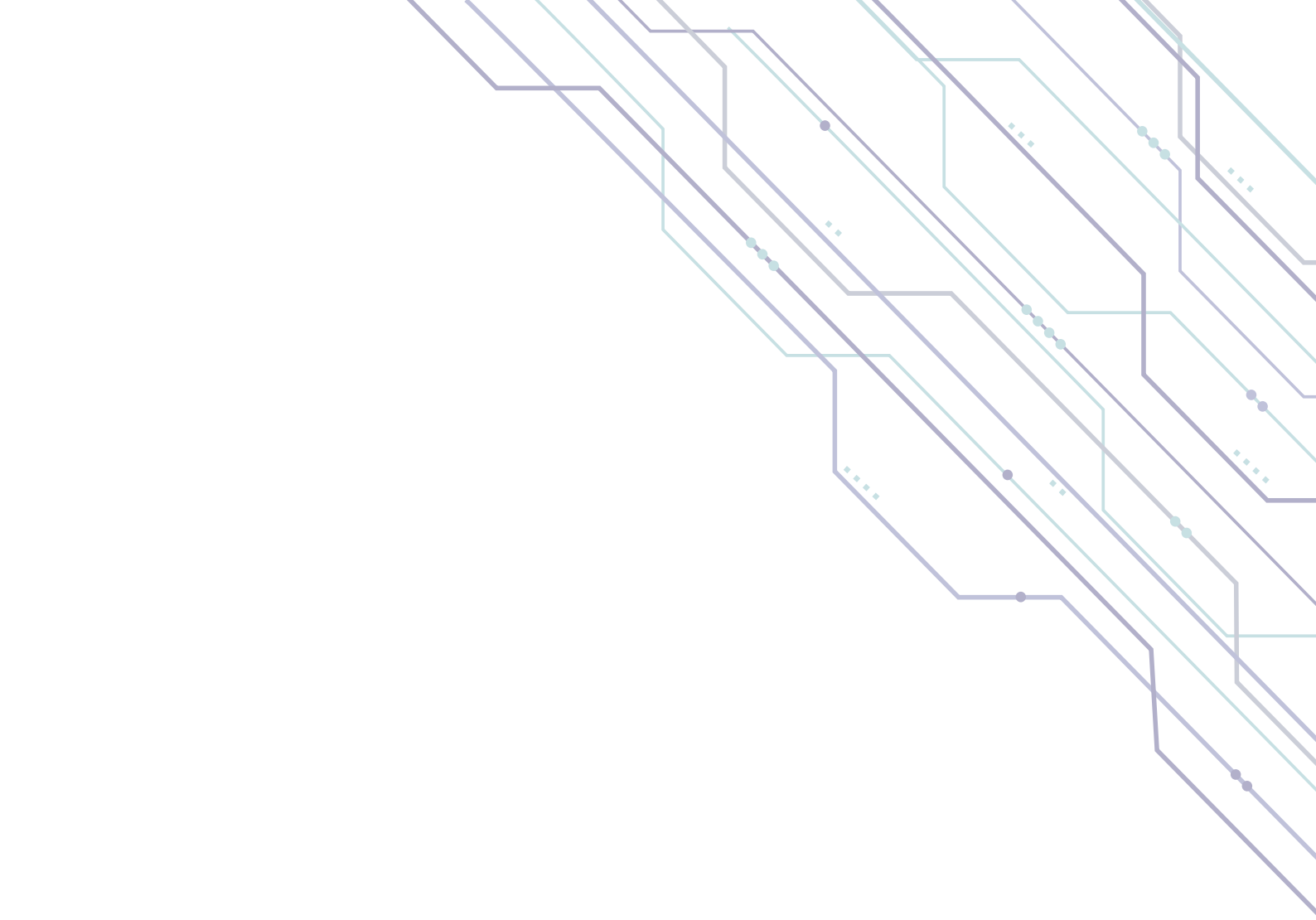
[10] *The error correction term refers to:* $\ln(M\&E)_{t-4} - \alpha - \beta_1\ln(Mfg)_{t-4} - \beta_2\ln(MfgShare)_{t-4} - \beta_3\ln(Price)_{t-4}$



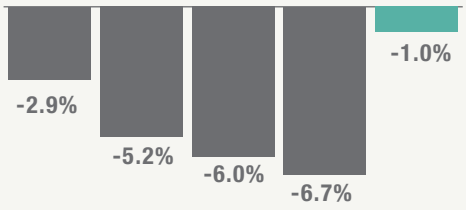
CHAPTER 2
Sectoral Performance

Image courtesy of Singapore Economic Development Board

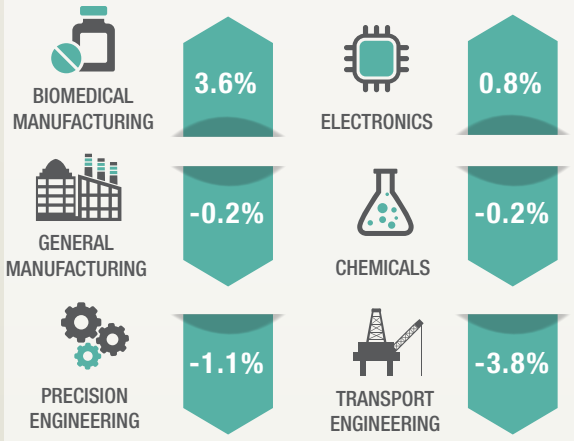
CHAPTER 2
SECTORAL PERFORMANCE

MANUFACTURING

Real Growth

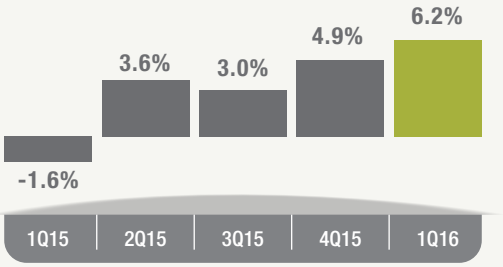


Clusters in Manufacturing Sector %-point contribution in 1Q16

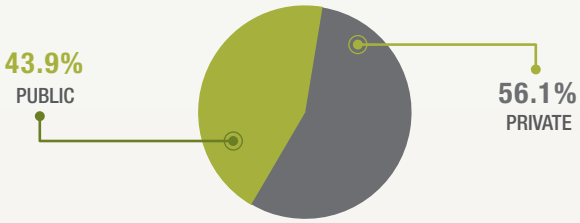


CONSTRUCTION

Real Growth



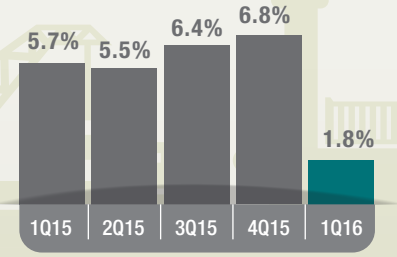
Certified Payments in 1Q16



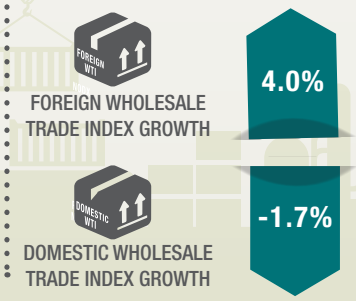
Contracts Awarded in 1Q16

WHOLESALE & RETAIL TRADE

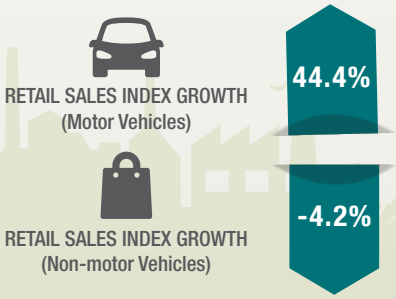
Real Growth



Wholesale Trade

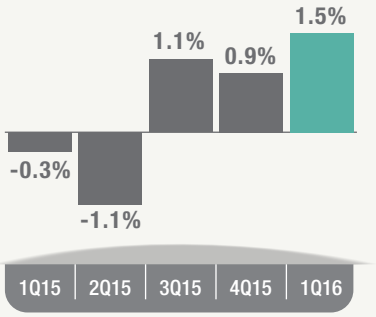


Retail Trade



ACCOMMODATION & FOOD SERVICES

Real Growth



Accommodation

Performance of hotels

LUXURY

UPSCALE

MID-TIER

ECONOMY

Gross lettings growth: 6.5%

Room revenue growth: 4.5%

Food Services

Performance of F&B (Sales growth)

OTHERS 2.4%

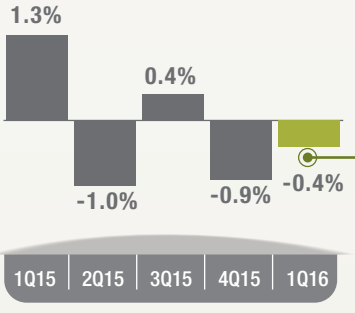
FAST FOOD 1.7%

CATERING -1.5%

RESTAURANTS -9.2%

TRANSPORTATION & STORAGE

Real Growth



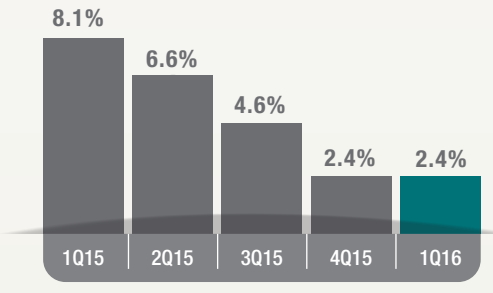
TOTAL SEA CARGO HANDLED GROWTH -2.5%

MOTOR-VEHICLE POPULATION GROWTH -1.4%

AIR PASSENGERS HANDLED GROWTH 10.2%

FINANCE & INSURANCE

Real Growth



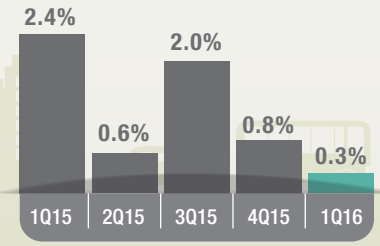
Growth of bank loans & advances to non-bank customers in 1Q16

-4.2% LOANS TO BUSINESSES

+1.9% CONSUMER LOANS

BUSINESS SERVICES

Real Growth



Private Residential Real Estate

7.2% UNITS TRANSACTED (Y-O-Y CHANGE)

-0.7% PRICE INDEX (Q-O-Q CHANGE)

OVERVIEW

In the first quarter of 2016,

- The manufacturing sector contracted by 1.0 per cent, an improvement from the decline of 6.7 per cent in the fourth quarter of 2015. While output declines in the transport engineering and precision engineering clusters weighed on growth, output expansions in the biomedical manufacturing and electronics clusters lent some support.

- The construction sector registered growth of 6.2 per cent, picking up from the 4.9 per cent expansion in the previous quarter. The improvement came on the back of resilient growth in public sector construction activities, which was in turn supported by an increase in public civil engineering construction works.

- The wholesale & retail trade sector grew by 1.8 per cent, easing from the strong growth of 6.8 per cent in the previous quarter. Growth in the sector was mainly supported by the wholesale trade segment.

- Weighed down by the water transport segment, the transportation & storage sector contracted by 0.4 per cent, following the 0.9 per cent contraction in the previous quarter.

- The accommodation & food services sector grew by 1.5 per cent, extending the 0.9 per cent growth in the previous quarter. Growth came on the back of an improvement in visitor arrivals to Singapore, which benefitted the accommodation segment.

- The finance & insurance sector expanded by 2.4 per cent, unchanged from the preceding quarter, as firm growth in the forex and life insurance segments offset the slowdown in ACU non-bank lending and fund management activities.

- The business services sector grew by 0.3 per cent, moderating from the 0.8 per cent expansion in the previous quarter. Growth in the sector was supported by the rental & leasing segment, as well as the head offices & business representative offices segment.

MANUFACTURING

In the first quarter, the manufacturing sector contracted by 1.0 per cent, improving from the 6.7 per cent contraction recorded in the previous quarter (Exhibit 2.1). The fall in the output of the transport engineering and precision engineering clusters placed the greatest drag on growth. On the other hand, increases in the output of the biomedical manufacturing and electronics clusters supported growth (Exhibit 2.2).

Exhibit 2.1: Manufacturing Sector's Growth Rates

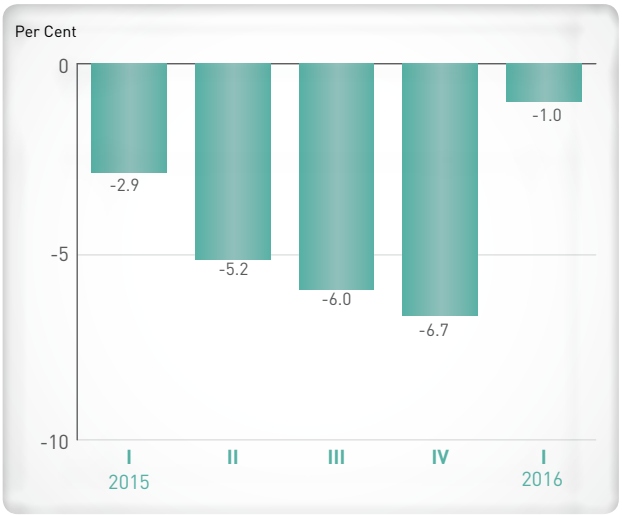
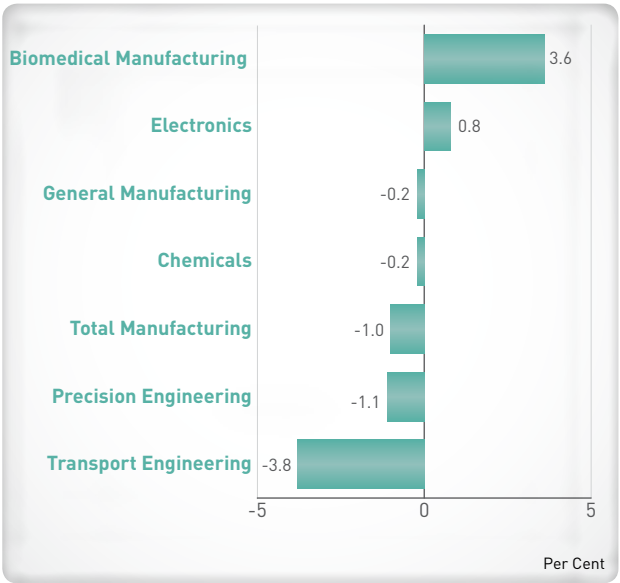


Exhibit 2.2: Percentage-Point Contribution to Manufacturing Clusters' Growth in 1Q 2016



The output of the biomedical manufacturing cluster increased by 19 per cent in the first quarter, underpinned by robust growth in both the pharmaceuticals and medical technology segments. Growth in the pharmaceuticals segment surged to 22 per cent on the back of a higher production of active pharmaceutical ingredients. Meanwhile, the medical technology segment expanded by 11 per cent, supported by higher export demand for medical instruments.

The electronics cluster grew by 3.0 per cent in the first quarter. The semiconductors (9.7 per cent) and other electronic modules & components (5.8 per cent) segments clocked increases in output. However, these increases were partially offset by output declines in the rest of the electronic cluster. Specifically, the output of the infocomms & consumer electronics, computer peripherals and data storage segments fell by 15 per cent, 10 per cent and 8.0 per cent respectively.

Output of the general manufacturing industries fell by 1.5 per cent in the first quarter. The decline can be attributed to the miscellaneous industries and printing segments, which contracted by 4.1 per cent and 7.2 per cent respectively, with the former affected by lower output in steel structural components and metal tanks & containers. On the other hand, the food, beverages & tobacco segment grew by 3.0 per cent, supported by export demand.

The chemicals cluster contracted by 2.7 per cent in the first quarter, weighed down primarily by the petrochemicals segment. In particular, output in the petrochemicals segment fell by 15 per cent due to plant maintenance shutdowns. On the other hand, growth was supported by the other chemicals segment, which saw output grow by 10 per cent on account of an increase in the production of fragrances.

The precision engineering cluster saw an 8.4 per cent drop in output in the first quarter. The poor performance of firms supporting the oil & gas industry amidst sustained low oil prices weighed on the cluster. In terms of segments, output in the precision modules & components segment contracted by 13 per cent due to a fall in the production of industrial rubber and metal precision components. At the same time, output in the machinery & systems segment fell by 5.2 per cent, weighed down by a decline in the production of lifting & handling and process control equipment.

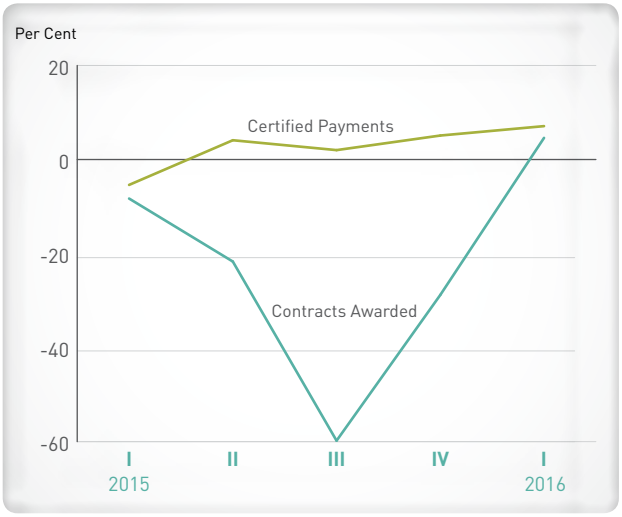
The output of the transport engineering cluster declined by 21 per cent in the first quarter, the sixth consecutive quarter of decline. The fall in output was largely due to continued weakness in the marine & offshore engineering segment, which contracted by 30 per cent due to the lower level of rig-building activity and weaker demand for oilfield & gasfield equipment in a sustained low oil price environment.

CONSTRUCTION

The construction sector expanded by 6.2 per cent in the first quarter, picking up from the 4.9 per cent expansion recorded in the previous quarter. The step-up in growth in the first quarter was largely the result of a robust expansion in public sector construction activities, which was in turn bolstered by healthy growth in public civil engineering construction works.

Nominal certified progress payments rose by 7.1 per cent, extending the 5.1 per cent increase in the previous quarter (Exhibit 2.3). The increase was supported by a 9.0 per cent expansion in public certified progress payments, which was primarily driven by public civil engineering (37 per cent) works such as the construction of various stations and associated tunnels for the Thomson-East Coast MRT Line. In addition, private certified progress payments grew at a healthy pace of 5.6 per cent, with certified payments for private industrial building works (39 per cent) providing support.

Exhibit 2.3: Changes in Contracts Awarded and Certified Payments



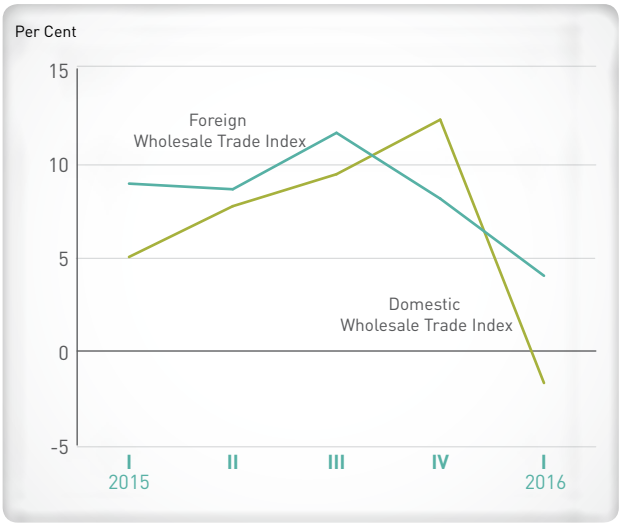
Construction demand in terms of contracts awarded rebounded in the first quarter, expanding by 4.6 per cent, reversing the 29 per cent fall in the previous quarter (Exhibit 2.3). The improvement was due to a surge in public sector demand (84 per cent), which came on the back of the award of major civil engineering contracts for the Thomson-East Coast Line. By contrast, private sector contracts awarded remained weak, contracting by 74 per cent in the first quarter, extending the 47 per cent decline in the preceding quarter. In particular, segments such as private industrial building (-73 per cent), private residential building (-86 per cent) and private commercial building (-60 per cent) developments registered hefty declines in contracts awarded.

WHOLESALE & RETAIL TRADE

The wholesale & retail trade sector grew by 1.8 per cent in the first quarter, moderating from the 6.8 per cent expansion in the previous quarter.

The wholesale trade segment was supported by growth in foreign wholesale trade sales volume. Specifically, the foreign wholesale trade index increased by 4.0 per cent, lower than the 8.1 per cent growth in the preceding quarter (Exhibit 2.4). Growth in foreign wholesale trade was driven by sales in petroleum & petroleum products (16 per cent), chemicals & chemical products (5.9 per cent) and ship chandlers & bunkering (12 per cent).

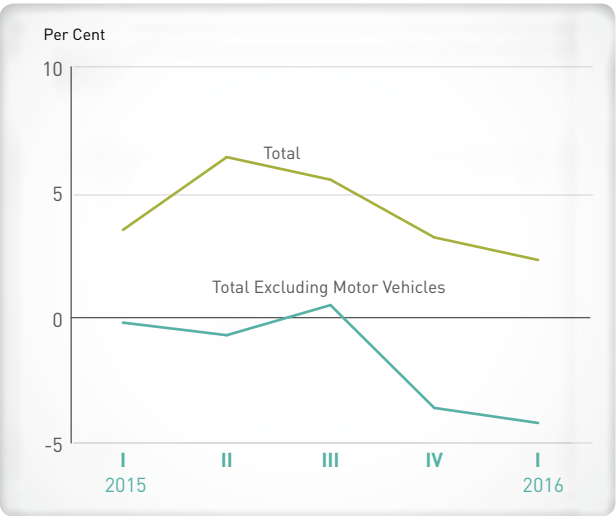
Exhibit 2.4: Change in Wholesale Trade Index at Constant Prices



On the other hand, domestic wholesale trade sales recorded sluggish performance. In particular, the domestic wholesale trade index fell by 1.7 per cent, a sharp turnaround from the 12 per cent increase in the preceding quarter. The performance was dragged down by poor sales volume in general wholesale trade (-26 per cent), electronic components (-7.9 per cent) and industrial & construction machinery (-8.3 per cent).

Overall retail trade sales volume rose by 2.3 per cent in the first quarter, slowing from the 3.2 per cent increase registered in the preceding quarter (Exhibit 2.5). Growth in the quarter was supported mainly by a 44 per cent increase in the volume of motor vehicle sales, in line with an increase in the supply of Certificate of Entitlements. Excluding motor vehicles, retail sales volume continued to languish, shrinking by 4.2 per cent in the first quarter. The contraction in retail sales volume (excluding motor vehicles) was more keenly felt by retailers of discretionary goods. In particular, the sales of telecommunications & computers, food & beverages, and watches & jewellery registered the sharpest declines of 22 per cent, 19 per cent and 11 per cent respectively.

Exhibit 2.5: Changes in Retail Price Index at Constant Prices

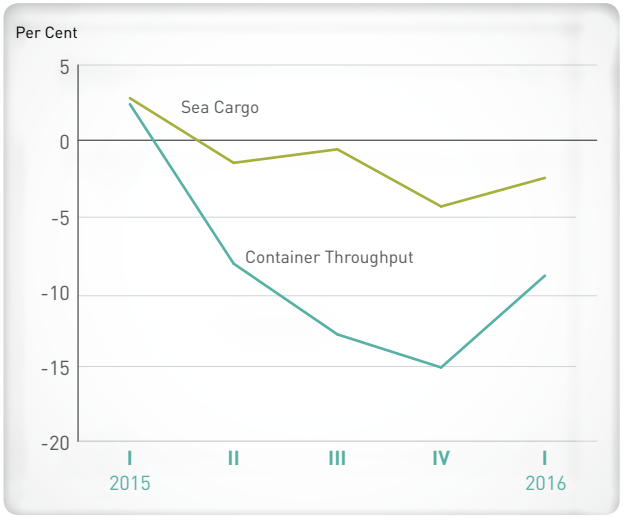


TRANSPORTATION & STORAGE

The transportation & storage sector contracted by 0.4 per cent in the first quarter, following the 0.9 per cent dip in the previous quarter.

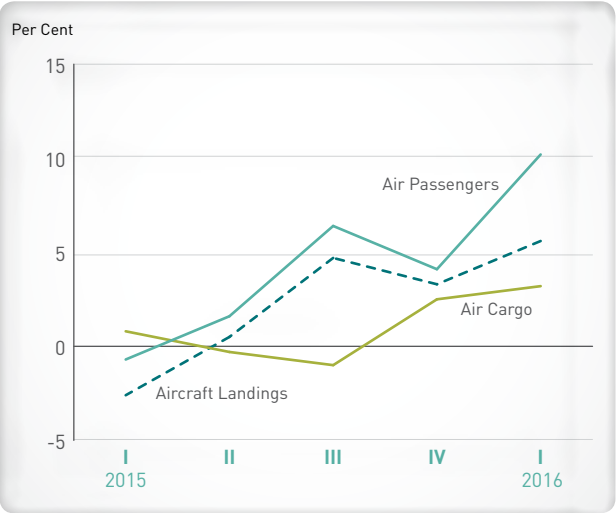
Growth of the sector was mainly dragged down by the water transport segment. Specifically, the volume of total sea cargo handled shrank by 2.5 per cent in the first quarter, extending the 4.4 per cent decline in the preceding quarter. This was in turn mainly caused by a 9.0 per cent slump in container throughput handled at Singapore's ports, the fourth consecutive quarter of decline (Exhibit 2.6). The continued weakness in container throughput was partly due to the formation of two shipping liner alliances in 2015, which had led to a consolidation of capacity and network coverage outside of Singapore. Additionally, the slowdown in China's industrial sector had weighed on regional trade flows.

Exhibit 2.6: Change in Container Throughput and Sea Cargo Handled



By contrast, the performance of the air transport segment strengthened on the back of improved air passenger traffic at Changi Airport. In particular, the number of air passengers passing through Changi Airport surged by 10 per cent in the first quarter, accelerating from the 4.1 per cent increase in the previous quarter (Exhibit 2.7). The higher air passenger traffic was supported by continued improvements in passenger movements to and from China, Thailand and Malaysia, as well as a rebound in passenger traffic on the Singapore-Indonesia route. At the same time, total air cargo shipments handled at Changi Airport also picked up, growing by 3.2 per cent in the first quarter, faster than the 2.5 per cent increase in the preceding quarter.

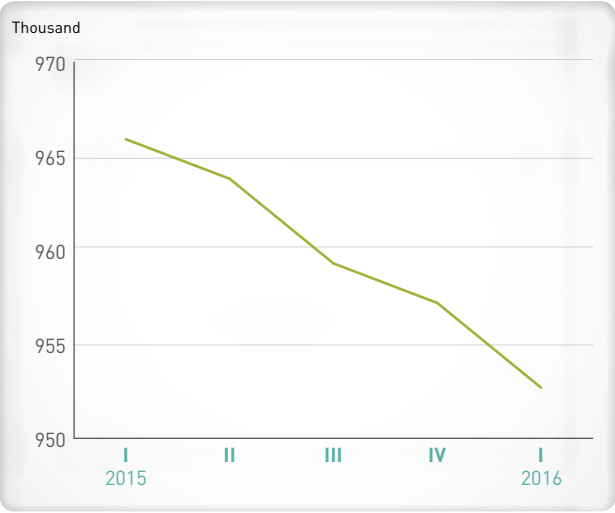
Exhibit 2.7: Changes in Air Transport



The number of aircraft landings rose by 5.6 per cent in the first quarter to reach 44,393, higher than the 3.3 per cent growth in the previous quarter.

As of March 2016, the total number of vehicles registered with the Land Transport Authority fell by 1.4 per cent to a total of 952,731 (Exhibit 2.8). These comprised 567,993 private and company cars, 32,545 rental cars, 28,286 taxis, 18,388 buses, 143,314 motorcycles and scooters, and 162,205 goods vehicles and other vehicle types.

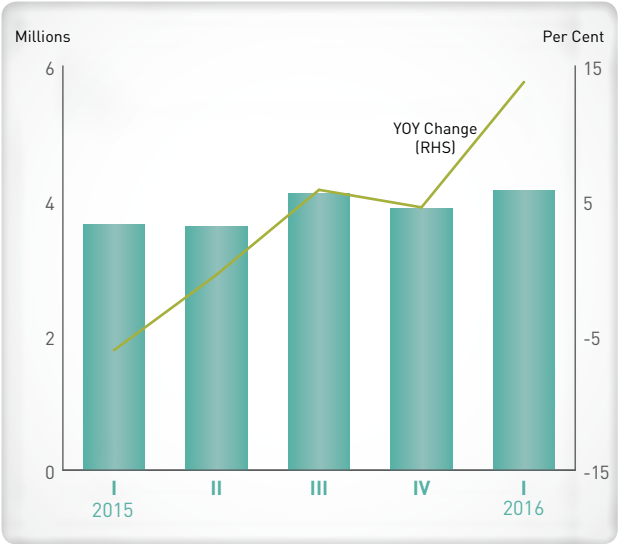
Exhibit 2.8: Motor Vehicles Registered



ACCOMMODATION & FOOD SERVICES

The accommodation & food services sector registered growth of 1.5 per cent in the first quarter, extending the 0.9 per cent growth experienced in the previous quarter. This was largely due to a recovery in visitor arrivals, which benefitted the accommodation segment.

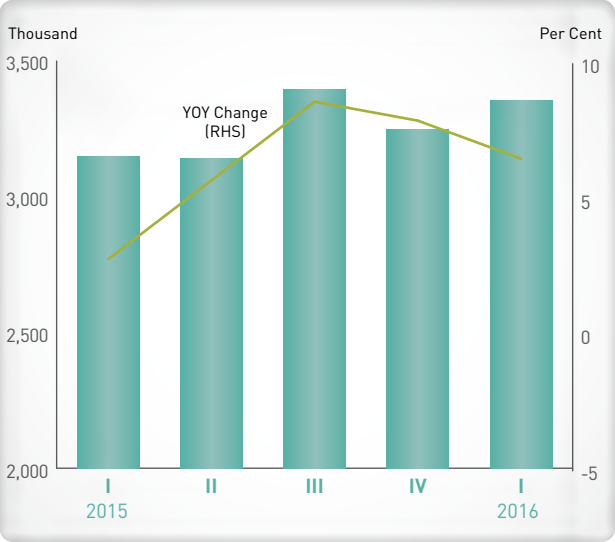
Exhibit 2.9: Visitor Arrivals



Total visitor arrivals rose by 14 per cent in the first quarter, accelerating from the 4.5 per cent increase in the previous quarter (Exhibit 2.9). The positive showing was partly due to an uptick in the number of MICE events such as the biennial Singapore Airshow, which had supported the growth in visitors from key inbound markets. The number of Chinese arrivals surged by 47 per cent in the first quarter, up from the 26 per cent growth in the preceding quarter, partly bolstered by improvements in connectivity through the addition of flights between Singapore and Chinese cities.

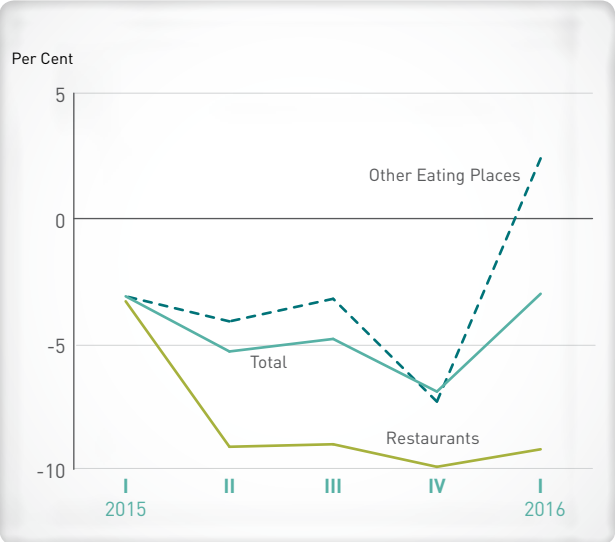
In line with the pick-up in visitor arrivals, the gross lettings of gazetted hotels grew by 6.5 per cent in the first quarter (Exhibit 2.10). The improvement in gross lettings outstripped a 6.0 per cent increase in room supply, resulting in the average occupancy rate of gazetted hotels rising by 0.4 percentage-points to reach 84 per cent.

Exhibit 2.10: Gross Lettings (Room Nights)



On the other hand, the volume of food & beverage sales remained weak in the first quarter. Specifically, food & beverage sales volume fell by 3.0 per cent, although this was an improvement from the 6.9 per cent decline in the previous quarter (Exhibit 2.11). The poor performance was mainly due to a sustained weakness in restaurant sales, which shrank by 9.2 per cent, extending the 9.9 per cent fall in the previous quarter. Sales of other eating places, however, rebounded to expand by 2.4 per cent, a reversal of the 7.3 per cent contraction recorded in the preceding period.

Exhibit 2.11: Changes in Food & Beverage Services Index at Constant Prices

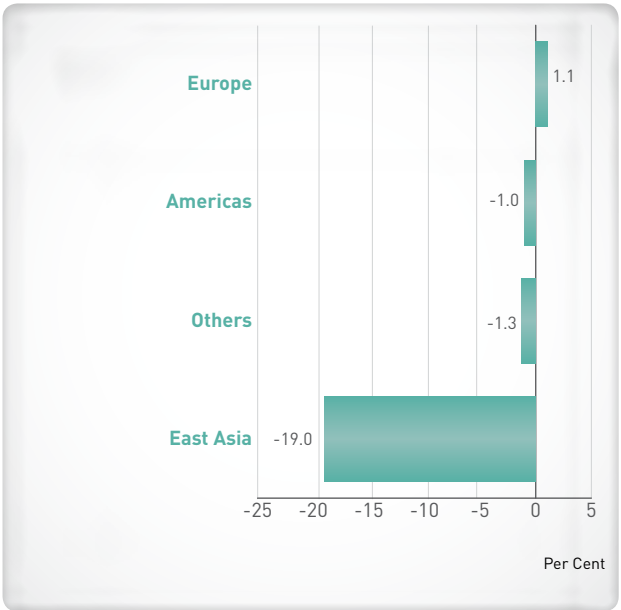


FINANCE & INSURANCE

The finance & insurance sector grew by 2.4 per cent in the first quarter, unchanged from the preceding quarter. However, the growth performance was mixed within the sector.

Notably, softer trade and economic growth in the region led to a pullback in loan demand. Asian Currency Unit (ACU) non-bank lending fell by 8.0 per cent, extending the 5.9 per cent decline in the previous quarter. This was largely due to a reduction in credit extended to East Asia, including China (Exhibit 2.12). On the domestic front, corporate loans also saw a 4.2 per cent decline, amidst tepid credit extended to the general commerce segment and non-bank financial institutions. Apart from the retraction in loan volumes, banking activity was also affected by a slowing in portfolio management and other banking services, such as trade financing and remittance.

Exhibit 2.12: Growth of ACU Loans & Advances to Non-Bank Customers by Region in 1Q 2016



The sentiment-sensitive cluster, however, saw some bounce-back in growth. The forex market registered a 27 percent year-on-year spike in average daily turnover during the quarter, which helped to offset the impact of falling net fees and commissions in the fund management industry. Meanwhile, the insurance industry posted healthy gains, supported in part by an increase in the uptake of life insurance policies.

BUSINESS SERVICES

The business services sector expanded by 0.3 per cent in the first quarter, moderating from the 0.8 per cent growth in the previous quarter. Growth in the sector was supported by the rental & leasing segment[1], as well as activities for head offices & business representative offices.

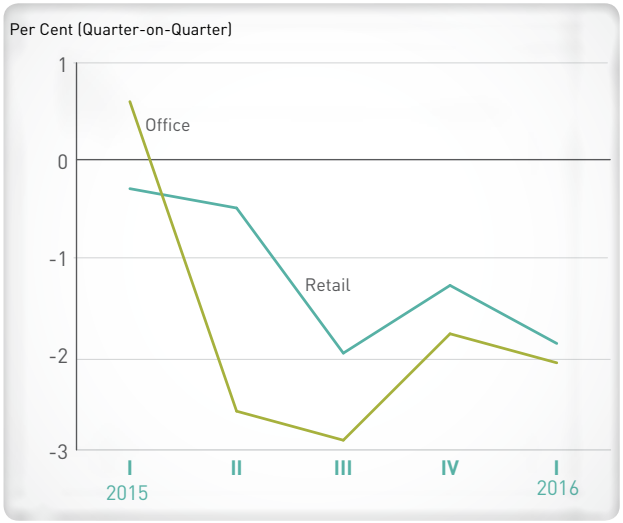
On the other hand, the real estate segment continued to languish in the first quarter, following sustained weaknesses seen in the prices of private residential units. In particular, private residential property prices declined by 0.7 per cent on a quarter-on-quarter basis, the tenth consecutive quarter of decline. Sale transactions of private residential units, however, continued to show signs of recovery as the private residential property market adjusted to lower prices. Specifically, private home sales grew by 7.2 per cent year-on-year, extending the 16 per cent increase registered in the previous quarter (Exhibit 2.13).

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

For the private retail space segment, rental growth remained lacklustre, declining by 1.9 per cent on a quarter-on-quarter basis, extending the 1.3 per cent contraction recorded in the previous quarter (Exhibit 2.14). This came as retailers continued to face challenging operating conditions, contributed by labour constraints and lacklustre consumer demand. In tandem with subdued rental growth, occupancy rates held steady at 92 per cent, similar to the occupancy rate registered the quarter before.

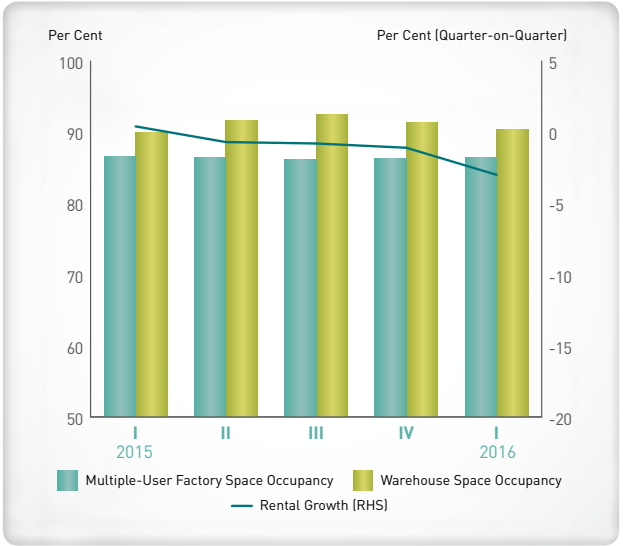
Likewise, the office space segment deteriorated on the back of weaker demand, with rentals declining by 2.1 per cent on a quarter-on-quarter basis, extending the 1.8 per cent decline in the previous quarter. At the same time, occupancy rates remained stable at 90 per cent, similar to the previous quarter.

Exhibit 2.14: Changes in Rentals of Private Sector Office and Retail Spaces



In the industrial space market, overall rentals fell by 3.0 per cent on a quarter-on-quarter basis, worsening from the 1.1 per cent decline recorded in the previous quarter. This came as occupancy rate in the private multiple-user factory space segment remained stable at 86 per cent, similar to the occupancy rate registered in the previous quarter (Exhibit 2.15). By contrast, occupancy rates for private sector warehouse space continued to decline, reaching 90 per cent in the first quarter, as compared to the 91 per cent in the previous quarter.

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



[1] *This comprises of renting & leasing of motor vehicles, renting & leasing of other machinery, equipment and tangible goods and the leasing of non-financial intangible assets.*

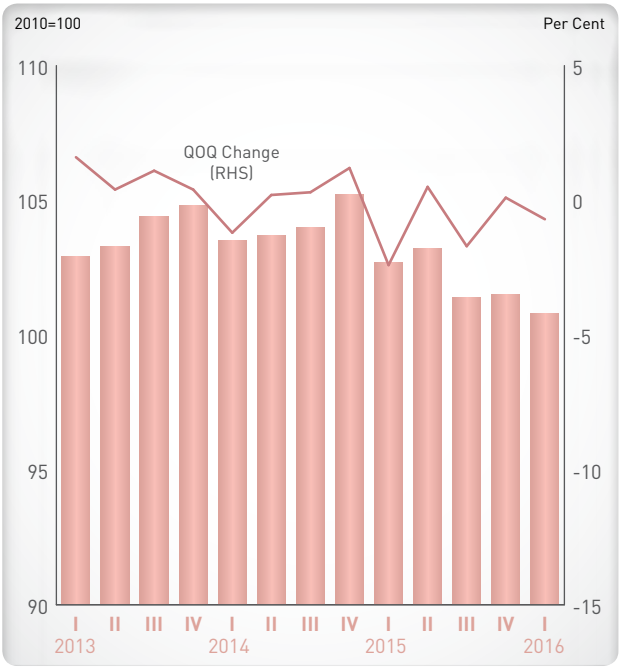
CHAPTER 3
Economic Outlook

CHAPTER 3
ECONOMIC OUTLOOK

LEADING INDICATORS

The near-term economic outlook for Singapore remains challenging, with the composite leading index (CLI) pointing to subdued growth ahead. The In particular, the CLI declined by 0.7 per cent on a quarter-on-quarter basis in the first quarter of 2016, a reversal from the 0.1 expansion in the previous quarter (Exhibit 3.1).

Exhibit 3.1: Composite Leading Index Levels and Growth Rate



Of the nine components within the CLI, four of them rose compared to the preceding quarter, namely non-oil retained imports, non-oil sea cargo handled, wholesale trade and the US Purchasing Managers' Index.

Meanwhile, the other five components – money supply, new companies formed, stock of finished goods, stock price and domestic liquidity – declined compared to a quarter ago.

OUTLOOK FOR 2016

The global economic outlook has weakened since early 2016, with global growth for the year now expected to be broadly similar to that in 2015. In particular, the growth outlook for the advanced economies has deteriorated marginally.

In the US, growth momentum has slowed in recent months, mainly due to weaker exports and a further pullback in oil-related investments. For the year as a whole, the US economy is now projected to grow at a similar pace as compared to 2015, supported by domestic demand on the back of a continued recovery in both the labour and housing markets. Similarly, the pace of recovery in the Eurozone economy has been uneven, and growth for the year is projected to remain modest. In particular, consumer confidence remains weak and could weigh on consumption expenditure in the region. However, continued improvements in the unemployment situation in most economies, coupled with highly accommodative monetary conditions, should help to support domestic demand.

In Asia, China's growth is projected to moderate, as the economy continues to rebalance away from industrial production and investment-driven growth towards services and consumption-driven growth. Nonetheless, the slowdown is expected to be gradual, as accommodative monetary conditions and the expansion of fiscal stimulus, along with structural reforms to boost consumption, are likely to provide support to growth. Meanwhile, growth in most key ASEAN economies is expected to see a modest improvement on the back of resilient domestic demand.

At the same time, the global economic outlook remains clouded with significant uncertainties and downside risks. First, in China, there is a risk that ongoing reforms could have the unintended effect of precipitating a significant drop in demand. If this materialises, China's economy could slow down more sharply than expected. The impact of the slowdown could also be amplified through the financial system should debt defaults spike. Second, there continues to be the risk of an unanticipated quickening of the normalisation of monetary conditions in the US. Should this happen, regional countries could face large capital outflows, resulting in pressures on their currencies and asset markets. Third, in the Eurozone, uncertainties in the run-up to the referendum in June on Britain's exit from the European Union (i.e., Brexit) could adversely affect sentiments and investor confidence in the region, thus leading to lower investments and consumption. The loss of investor confidence amidst heightened political risks could also lead to higher debt servicing costs in the peripheral economies.

Domestically, the softening of global economic conditions, as well as the continued sluggishness in global trade, could weigh on externally-oriented sectors such as the manufacturing and transportation & storage sectors. Persistent low oil prices will also continue to dampen the outlook for firms in the marine & offshore segment, and those in the precision engineering cluster that support the oil & gas industry. While sectors such as finance & insurance and wholesale trade could see a moderation in growth compared to 2015, they are still likely to provide some support to overall GDP growth for the year. In addition, tourism-related sectors may see a boost from the recovery in visitor arrivals, while the biomedical manufacturing cluster could see an uptick in production due to the introduction of new active pharmaceutical ingredients.

Taking into account the above factors, and barring the full materialisation of downside risks, the 2016 growth forecast for the Singapore economy is maintained at **1.0 to 3.0 per cent**.

FEATURE ARTICLE

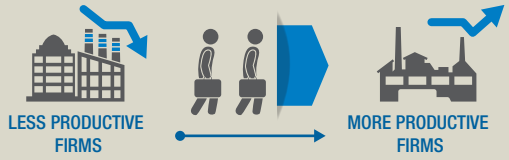
FEATURE ARTICLE

FIRM DYNAMICS AND THEIR IMPACT ON PRODUCTIVITY GROWTH IN THE MANUFACTURING SECTOR

INTRODUCTION

In a well-functioning economy, market share and resources are likely to shift towards more productive firms as a consequence of competition. The shift can occur either through a **positive reallocation effect** or **positive churn effect**

POSITIVE REALLOCATION EFFECT



Reallocation of labour from less productive to more productive firms among incumbent firms

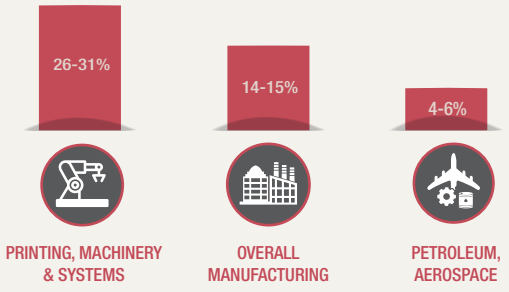
POSITIVE FIRM CHURN EFFECT

Exit of less productive firms and entry of more productive firms

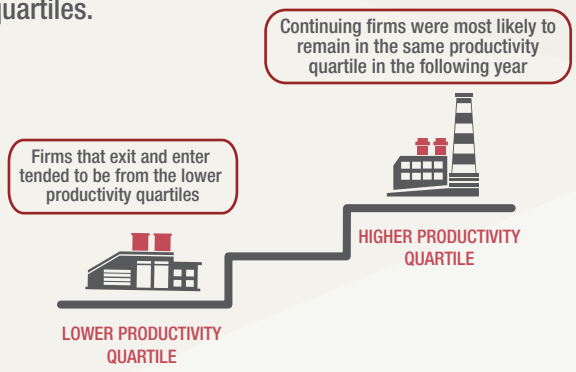
FINDINGS

Finding 1: Firm churn was higher in segments such as printing and machinery & systems, likely due to a higher number of SMEs in these segments. Segments such as petroleum and aerospace, had lower entry and exit rates

AVERAGE ENTRY AND EXIT RATES

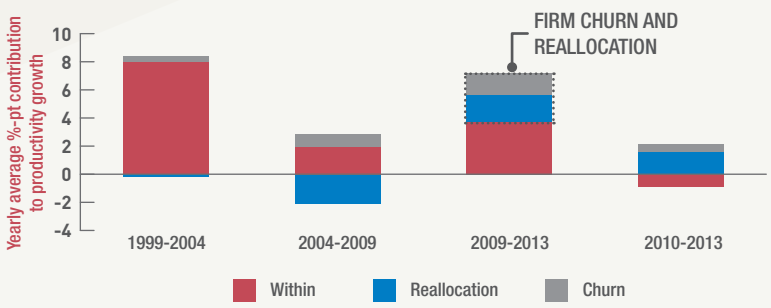


Findings 2 & 3: There was persistence in productivity, as continuing firms were most likely to remain in the same productivity quartile. Firms in the lower productivity quartiles were more likely to exit, while entry firms tended to start in the lower productivity quartiles.



Finding 4: Firm churn and reallocation effects contributed positively to productivity growth in the manufacturing sector over the 2009-2013 period

DECOMPOSITION OF PRODUCTIVITY GROWTH IN THE MANUFACTURING SECTOR



EXECUTIVE SUMMARY

- This article examines firm dynamics, especially the entry and exit of firms and the reallocation of labour across continuing firms, and their impact on productivity growth in the manufacturing sector. In terms of firm dynamics, our key observations are as follows: (i) different manufacturing segments had different rates of firm churn (i.e., the sum of exit and entry rates), with firm churn being higher in segments with a higher proportion of small- and medium-sized enterprises; (ii) there was persistence in the productivity performance of continuing firms; and (iii) firms in the lower productivity quartiles were more likely to exit, although entry firms also tended to start in the lower productivity quartiles.

- Next, we decompose labour productivity growth in the manufacturing sector into the contribution from (i) productivity improvements among continuing firms (i.e., within effect); (ii) the reallocation of labour across continuing firms of varying productivity levels and growth (i.e., reallocation effect); and (iii) the entry and exit of firms with different productivity levels (i.e., churn effect).

- Our results show that the firm churn effect contributed positively to productivity growth in the manufacturing sector for all three periods under study (i.e., 1999-2004, 2004-2009 and 2009-2013). In other words, firms entering the sector were more productive than firms exiting the sector on average in all time periods. There was also a net reallocation of labour from less productive firms to more productive firms in the sector in the latest period of 2009-2013. Collectively, the role of firm churn and reallocation effects in improving productivity was found to be significant after the Global Financial Crisis, accounting for 48 per cent of the improvement in productivity in the sector between 2009 and 2013.

- Our findings thus suggest that positive firm churn (where less productive firms exit and more productive firms enter) and the net reallocation of labour to more productive firms are important channels to achieve higher productivity growth in the Singapore economy.

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]

INTRODUCTION

In a well-functioning economy, market share and resources are likely to shift towards more productive firms as a consequence of competition. For instance, more productive firms are more likely to out-compete their less productive counterparts for customers, as well as to pay higher wages to attract workers. The shift in resources can thus occur either through a reallocation of labour from less productive to more productive firms among incumbent firms (i.e., positive reallocation effect) or through the exit of less productive firms and entry of more productive firms (i.e., positive churn effect). As the Singapore economy continues to restructure towards productivity-driven growth, both the firm churn and reallocation effects are likely to be important channels through which higher productivity growth can be achieved.

This study examines firm dynamics, particularly the entry and exit of firms and the reallocation of labour across continuing firms, in the manufacturing sector. It also quantifies the contribution of firm churn and the reallocation of labour across continuing firms to productivity growth in the sector.

LITERATURE REVIEW

Many studies have explored the determinants of firm-level productivity and the extent to which productivity performance persists at the firm level. For example, Syverson (2011) reviews the determinants of firm-level productivity and finds that managerial practices, the skills of labour inputs and the quality of capital inputs (e.g., level of technology) are important drivers of productivity. Foster, Haltiwanger and Krizan (2006) further show that productivity performance tend to persist among incumbent firms in the US, with more productive firms generally remaining more productive over time and vice versa.

[1] *We would like to thank Ms Yong Yik Wei for her useful suggestions and comments. We are also grateful to Ms Stephanie Mak for her inputs to this study. All remaining errors belong to the authors.*

Several studies have also found that firm churn and the reallocation of labour across firms are important channels to improve productivity at the aggregate level. For the US economy, Baily, Hulten and Campbell (1992) show that firm churn and reallocation played a positive role in driving productivity growth in the manufacturing sector from 1977 to 1982, although the impact of reallocation was larger than that of firm churn. In a recent study, Foster, Grim and Haltiwanger (2016) show that while the reallocation of labour and firm churn continued to improve productivity in the US, their impact was far more limited during the Global Financial Crisis as compared to previous recessions.

Cross-country analyses were also carried out by Bartelsman, Haltiwanger and Scarpetta (2009) using data from the 1970s to the early 2000s. They find that the effect of firm churn was large and important in driving productivity growth across countries, while the effect of the reallocation of labour across firms varied significantly across countries.

DATA

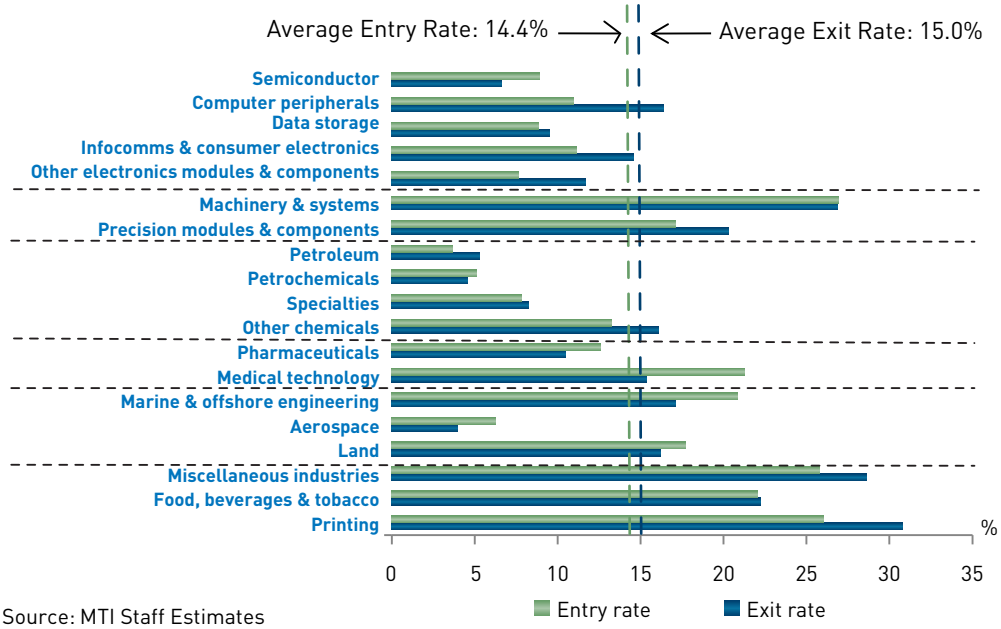
Our study uses anonymised firm-level data from the Census of Manufacturing Activities (CMA) survey for the years 1999 to 2013. The panel dataset tracks the performance of firms on an annual basis[2], and contains firm-level characteristics such as the value-added and capital expenditure of the firm, the number of workers hired by the firm, and the manufacturing segment that the firm is in.

TRENDS IN FIRM DYNAMICS AND PRODUCTIVITY

An examination of the data leads to three key observations on firm dynamics in Singapore's manufacturing sector over the period of 1999 to 2013.

First, different manufacturing segments had different rates of firm churn (i.e., the sum of exit and entry rates). Across the manufacturing segments, the average annual entry and exit rates[3] of firms were around 14 per cent and 15 per cent respectively (Exhibit 1). Firm churn tended to be higher in segments like the printing and machinery & systems segments, possibly due to a larger number of small- and medium-sized enterprises (SMEs) in these segments. By contrast, segments generally dominated by larger firms, such as the petroleum and aerospace segments, had lower entry and exit rates of around 4 per cent to 6 per cent.

Exhibit 1: Average entry and exit rates for each segment over the 1999 to 2013 period



Source: MTI Staff Estimates

[2] The CMA survey covers with certainty larger firms with more than 20 workers, and once surveyed, will be surveyed in subsequent years unless the company's employment falls below 20. For firms with less than 20 workers, they will be randomly sampled.

[3] Exit rate is calculated as the number of firms out of the total number of firms in a particular year that had exited by the following year. Entry rate is calculated as the number of firms that had entered in a particular year out of the total number of firms in that year.

Second, there was persistence in the productivity ranking of continuing firms. Firms were first grouped into productivity quartiles based on their productivity performance in a particular year. The transition matrix in Exhibit 2 tracks the productivity quartile where the firms in each quartile ended up in the following year. For example, 70 per cent of the firms in the highest productivity quartile (i.e., 4th quartile) in the initial year remained in the highest productivity quartile the next year. From the transition matrix, it is clear that the most likely outcome for firms in each productivity quartile is that they will remain in the same quartile the following year.

Third, firms in the lower productivity quartiles were more likely to exit, while entry firms also tended to start in the lower productivity quartiles (Exhibit 2). Specifically, firms in the 1st productivity quartile had a 25 per cent probability of exiting the next year compared to a 9 per cent probability for firms in the 4th quartile. In terms of entry firms, 39 per cent of them started in the 1st productivity quartile, while only 18 per cent started in the 4th quartile.

Exhibit 2: Transition matrix groups firms into productivity quartiles in the initial year and tracks their productivity quartile (or exit) in the next year

		Next Year					Total
		1st Quartile	2nd Quartile	3rd Quartile	4th Quartile	Exit firms	
Initial Year	1st Quartile	51%	17%	4%	3%	25%	100%
	2nd Quartile	16%	47%	16%	3%	17%	100%
	3rd Quartile	5%	19%	49%	16%	12%	100%
	4th Quartile	2%	3%	16%	70%	9%	100%
	Entry firms	39%	24%	20%	18%	-	100%

Source: MTI Staff Estimates

Note: The 1st quartile is the least productive and 4th quartile is the most productive. Transitions matrices were calculated annually from 1999-2013 for 19 manufacturing segments. Reported in the matrix above are the average percentages for all years and all segments.

DECOMPOSITION METHODOLOGY

Next, we quantify the contribution of firm churn and reallocation effects to productivity growth in the manufacturing sector.

Previous studies such as Goh (2014) and Goh and Fan (2015) had focused on the decomposition of Singapore's aggregate labour productivity growth into the contribution of within and shift effects at the *industry* level. The studies showed that within-industry productivity improvements contributed positively to aggregate labour productivity growth, whereas the shift effect across industries had been negative in recent years as less productive industries (e.g., construction) saw an increase in employment share.

In our study, we adopt a similar shift-share approach, but analyse the contribution of changes in labour productivity, reallocation and churn effects at the *firm*-level to manufacturing labour productivity. Specifically, we adopt the decomposition framework from Foster, Haltiwanger and Krizan (2001) to decompose labour productivity growth for each manufacturing segment into the following components:

- Within-firm productivity improvements: This is the contribution of each continuing firm's productivity growth to its segment's productivity growth.

- Reallocation of workers across continuing firms: This is the contribution from relative employment shifts into firms with different productivity levels (the "between" effect) or different productivity growth rates (the "cross" effect). Reallocation contributes positively to productivity growth when firms with higher productivity levels or faster productivity growth rates gain employment shares.

- Churn due to entry and exit of firms: This is the contribution of entering and exiting firms to the segment's productivity growth. Firm churn's contribution is positive when, on net, firms entering the segment are more productive than the firms exiting.

In equation form, the decomposition framework can be represented as:

$$\frac{\Delta P_{it}}{P_{it-1}} = \frac{\sum_{e \in C} s_{et-1} \Delta P_{et}}{P_{it-1}} \quad \text{Within}$$

$$+ \frac{\sum_{e \in C} (P_{et-1} - P_{it-1}) \Delta s_{et}}{P_{it-1}} \quad \text{Between}$$

$$+ \frac{\sum_{e \in C} \Delta s_{et} \Delta P_{et}}{P_{it-1}} \quad \text{Cross}$$

$$+ \frac{\sum_{e \in N} s_{et} (P_{et} - P_{it-1})}{P_{it-1}} \quad \text{Entry}$$

$$- \frac{\sum_{e \in X} s_{et-1} (P_{et-1} - P_{it-1})}{P_{it-1}} \quad \text{Exit}$$

Reallocation = Between + Cross

Churn = Entry − Exit

Where P_{it} is the nominal labour productivity of firm e in segment i in year t;
s denotes the firm's labour share within the segment;
C, N and X denote continuing, entering and exiting firms respectively.

We apply the decomposition framework on 19 manufacturing segments[4], and then average the results over all the segments to obtain the results for the manufacturing sector as a whole.[5] Our decomposition analysis was carried out for three time periods: 1999-2004, 2004-2009 and 2009-2013.

RESULTS OF DECOMPOSITION ANALYSIS

Using the decomposition methodology outlined above, we find that the firm churn effect contributed positively to productivity growth in the manufacturing sector for all three time periods under study, while the reallocation effect contributed positively in the most recent period of 2009-2013 (Exhibit 3).

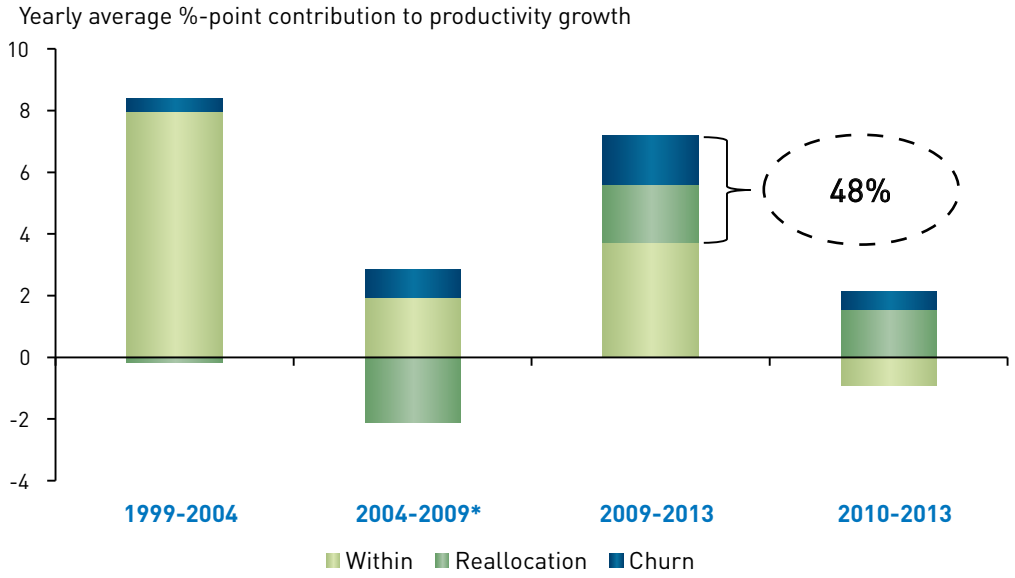
Collectively, the role of firm churn and reallocation effects in improving productivity became more significant after the Global Financial Crisis (GFC) (i.e., 2009-2013 period), accounting for 48 per cent of the overall improvement in productivity during this period. This was primarily due to a larger positive churn effect, with its contribution to productivity growth rising from 0.4 percentage-points (pp) during the 2004-2009 period to 1.6pp in the post-GFC period. The reallocation effect also contributed to improvements in productivity in the post-GFC period. The tightening of manpower policies in recent years would have tilted the balance towards more productive firms with higher capital intensity, as these firms are likely to be able to offer higher wages and hence increase their employment shares.

[4] *The 19 manufacturing segments are semiconductor, computer peripherals, data storage, infocommunications & consumer electronics, other electronic modules & components, petroleum, petrochemicals, specialty chemicals, other chemicals, pharmaceuticals, medical technology, machinery & systems, precision modules & components, marine & offshore engineering, aerospace, land transport, food, beverages & tobacco, printing and miscellaneous industries.*

[5] *The results are robust whether we take a simple average or weighted averages.*

At the same time, the within effect (i.e., productivity growth at the firm level) was positive and sizable in the post-GFC period, contributing 3.7pp to overall productivity growth during this period. This was largely due to a sharp rebound in firms' productivity performance in 2010 as the economy recovered from the GFC. Excluding 2009-2010, the within effect exerted a negative drag on productivity over the 2010-2013 period. The negative within effect for this period could be due to cyclical headwinds faced by manufacturing firms against the backdrop of a sluggish global economic environment.

Exhibit 3: Decomposition results for each time period



Source: MTI Staff Estimates
*Note: The within effect for the petrochemicals segment was excluded as this segment experienced a surge in this effect during the period.

CONCLUSION

This study analyses firm dynamics in the manufacturing sector. Our key observations are as follows. First, different manufacturing segments had different rates of firm churn. Segments which had a greater share of SMEs tended to experience more churn. Second, there is persistence in firm-level productivity rankings from year to year. Third, firms in the lower productivity quartiles were more likely to exit, although entry firms also tended to start in the lower productivity quartiles.

Based on a decomposition analysis using firm-level data, we find that both the firm churn and reallocation effects contributed positively to productivity growth in the manufacturing sector over the 2009-2013 period, accounting for 48 per cent of the sector's productivity growth during this period. This suggests that our restructuring efforts have by and large been effective in helping more productive firms in the manufacturing sector to grow, even as other firms consolidate or shift to other business areas.

As the Singapore economy continues to restructure to achieve productivity-driven growth, such channels of productivity improvements will remain important. Government policies should hence continue to encourage firms to innovate and adapt, even while allowing competitive market forces to work. To further improve our understanding of firm dynamics and their impact on productivity in the Singapore economy, future studies could extend the current analysis to the services and construction sectors.

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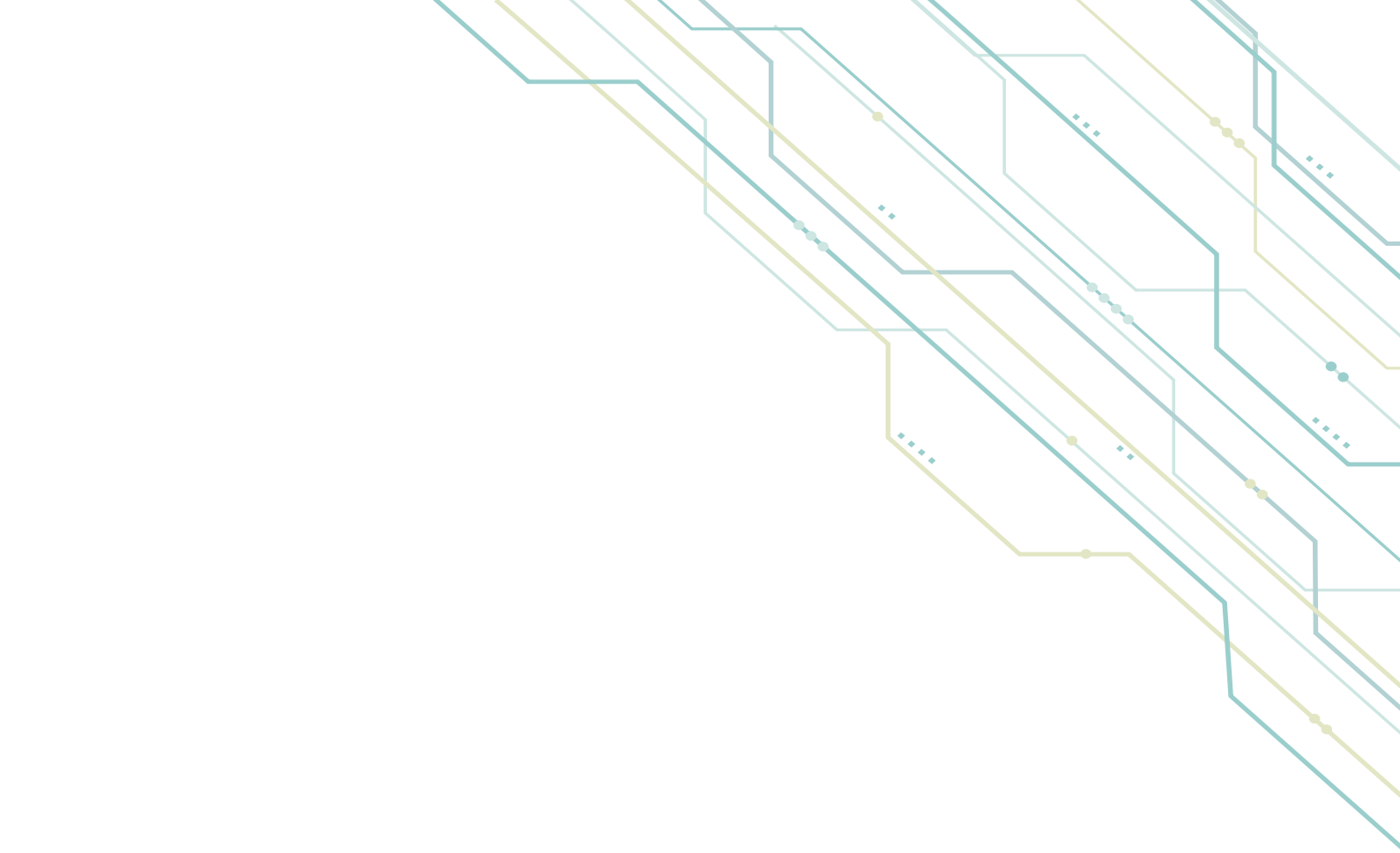

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