

## 2 The Singapore Economy

### An Uneven Recovery amid Industry Reconfiguration

*Domestic economic activity was sluggish over the last six months, with GDP growth in Q2–Q3 2014 averaging 0.6% q-o-q SAAR. Against the uneven recovery in the global economy, the external-facing services sectors saw some retraction in activity. More recently, the manufacturing sector turned around in Q3 2014, but the domestic-oriented sectors, which were strong contributors to overall growth in H1 2014, slowed appreciably.*

*This differentiated growth performance across sectors will continue to play out over the next few quarters. The overall expansion of the global economy should provide support to the domestic economy but the uneven pace of improvement across Singapore's trading partners will weigh on certain activities, especially the external-oriented services. In addition, some segments of manufacturing will continue to grapple with resource constraints and falling product prices. Meanwhile, domestic-oriented sectors will remain broadly resilient on the back of strong underlying demand, although businesses that are more reliant on labour inputs or face greater competition could experience profit margin pressures. The expected net outcome this year is GDP growth of 2.5–3.5%, and a similar pace of expansion is anticipated for 2015.*

*Amid these cyclical developments, important structural transitions are also taking place in the domestic economy. Specifically, a secular shift to higher-margin production is evident within the manufacturing sector as it responds to resource constraints. The continuous evolution of the sector has been an abiding reality of the Singapore industrial landscape. The domestic electronics industry, in particular, has repeatedly transformed itself and successfully moved up the value chain. More recently, a combination of factors including the absence of a strong recovery in Europe and the regional economies, as well as longer-term industry-specific factors, have prompted the ongoing upgrade within the domestic IT industry. Apart from high value-added production, locally-domiciled electronics firms have increasingly placed emphasis on activities such as chip design and delivery of services-driven IT solutions. The growth of these activities, in tandem with the global trend towards servicisation in IT, augurs well for Singapore's electronics and information & communications sectors, with a healthy pipeline of investments expected to boost output in the near to medium term.*

## 2.1 Recent Economic Developments

### A Muted Growth Outturn

Growth in the Singapore economy was flat over the last two quarters. While manufacturing output strengthened more recently, this was offset by a weak performance in the external-oriented services sectors due to tepid demand in Asia. In addition, the more labour-dependent industries continued to be weighed down by supply-side constraints. The domestic-oriented sectors, which were an important source of growth in the earlier part of the year, saw some slowdown alongside a tapering of projects in the construction sector.

#### Growth momentum in the Singapore economy remained weak into Q3.

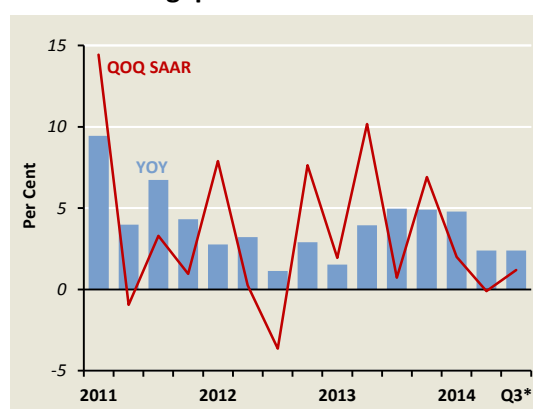
Domestic economic activity has been sluggish over the last six months. The Singapore economy contracted by 0.1% on a q-o-q SAAR basis in Q2. (Chart 2.1) Although the latest *Advance Estimates* point to a slight turnaround in Q3 with provisional growth of 1.2%, in level terms, this was only 0.3% higher than at the beginning of the year.

The short-term performance of the domestic economy reflects a confluence of factors. First, the manufacturing sector benefitted modestly from the uplift in the US economy. This, however, could not offset the decline among the external-oriented services industries which were hampered by relatively subdued trade activity in the region. (Chart 2.2) Second, firms that are more labour-intensive continued to be affected by domestic supply-side constraints. Third, the moderation in demand in some domestic-oriented industries, such as construction and retail trade, weighed on growth.

#### Overall manufacturing activity picked up, as adverse firm-specific effects in the electronics cluster dissipated ...

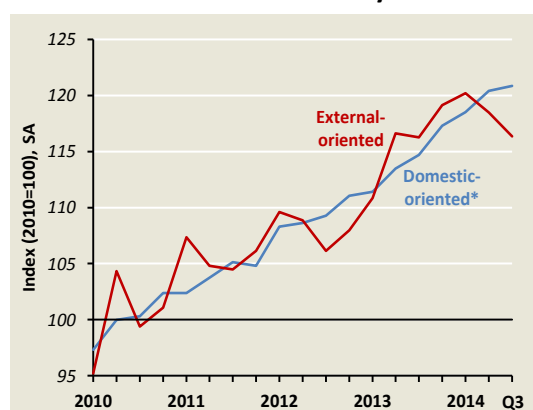
The manufacturing sector recorded a steep contraction of 15.1% q-o-q SAAR in Q2, largely due to the downshift in semiconductor output arising from firm-specific factors. Idiosyncratic movements within the IT industry appear to have an increasingly stronger influence on the performance of the electronics sector as compared to the external macroeconomic environment. This could be due to an increase in market concentration among the top IT firms based in Singapore.

Chart 2.1  
Singapore's GDP Growth



\* Advance Estimates.

Chart 2.2  
EPG's Economic Activity Index



Source: EPG, MAS estimates

\* Readings for Q3 2014 are based on an average of Jul–Aug data.

Specifically, the share of the top 20 firms in the electronics industry (by output) is estimated to have risen from 73% in 2005 to 77% in 2012. (Chart 2.3)

The broader domestic IT industry also showed signs of weakness, reflecting the ongoing pressures faced by manufacturers. Domestic IT manufacturers have been confronted with downward margin pressures. Besides the decline in product prices, firms in Singapore have had to adjust to higher operating costs and resource constraints. Nonetheless, such pressures are not new to the domestic IT industry and the cluster has been able to re-invent itself and move up the value chain. The responses of domestic manufacturers will be further discussed in Section 2.2.

Notwithstanding these challenges, the electronics industry—which is more tied to final demand in the advanced economies—benefited from some cyclical uplift in Q3 2014. Notably, the electronics cluster expanded by 6.5% q-o-q SA, following a contraction of a similar magnitude in Q2. The rebound was most pronounced in the data storage segment amid some tentative improvement in US corporate IT spending. In turn, the more favourable outturn in the domestic electronics industry spilled over to the supporting industries. Output in the precision engineering cluster grew by 2.2% q-o-q SA in Q3, reversing the contractions recorded in the first half of this year.

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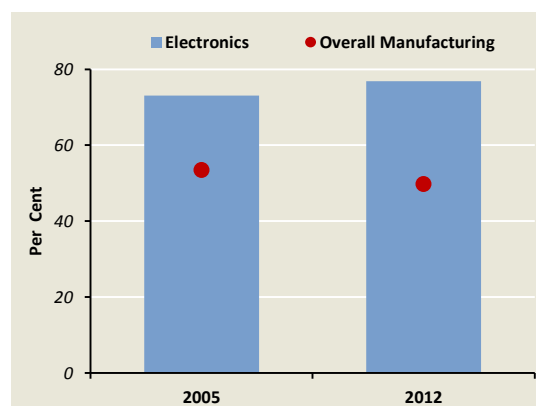
**... while softer regional demand and the recent fall in global commodity prices weighed on trade-related services activities.**

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Despite an improvement in manufacturing activity, the performance of the external-oriented services industries was muted due to softening regional and global commodity demand. This was most evident in re-exports, which saw volumes contract by 7.1% q-o-q SA in Q3, following the modest 1.1% expansion in the preceding quarter.

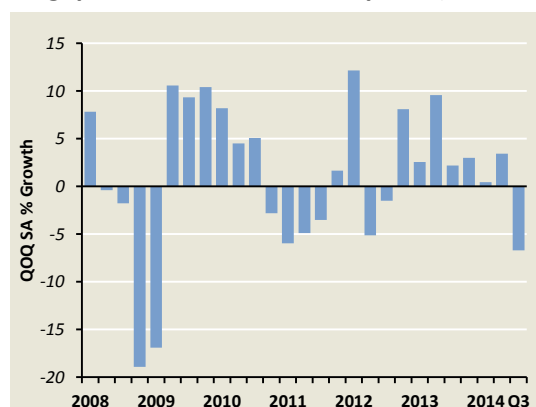
Following a stellar performance last year, re-exports of electronics moderated considerably in 2014. In fact, during Q3, IT re-export volumes registered its most significant contraction since the Global Financial Crisis (GFC). (Chart 2.4) Specifically, final demand for Singapore's IT re-exports, such as telecommunication devices, saw some pullback as a result of a step-down in demand from emerging markets.

**Chart 2.3**  
**Nominal Output Share of the Top 20 Electronics Firms in Singapore**



Source: DP Information Group Singapore 1000 Database and EPG, MAS estimates

**Chart 2.4**  
**Singapore's Electronics Re-exports (Volume)**



Furthermore, a decline in global commodity demand weighed on entrepôt activities. Oil re-export volumes saw a sharp sequential contraction of 29% in Q3 due, in part, to a fall in shipments to China. Concomitantly, bulk sea cargo volumes dipped 6.6% q-o-q over the same period. This lacklustre showing was in line with softening economic conditions in China as the effects of Beijing's mini-stimulus in April waned.

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**Financial services also saw a cyclical downshift in Q3 as demand from Asia waned.**

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The financial services sector expanded by a robust 11.6% q-o-q SAAR in Q2 2014, largely buoyed by healthy offshore credit demand and some improvements in interest margins in the domestic financial intermediation segment. However, activity slowed in Q3, weighed down by a moderation in regional demand. In recent quarters, lending to East Asia has been the key driver of offshore non-bank loan growth. As support from East Asia abated in tandem with the slowing Chinese economy in Jul–Aug, ACU non-bank lending slipped as well. (Chart 2.5) In addition, domestic non-bank loan growth was impacted by a step-down in trade financing, with bills discounted by banks falling by 4.0% m-o-m in Jul–Aug on average.

Meanwhile, sentiment-sensitive activities remained weak over the last two quarters. Average daily turnover volume in the domestic stock market fell by 26% q-o-q in Q2, in part, reflecting cautious investor sentiment amid geopolitical tensions in Iraq, Thailand and Ukraine. The escalation of the Russia-Ukraine conflict further dampened trading interest in Q3 2014. Even a surge in new listings (funds raised rose by 314% q-o-q) during the quarter failed to galvanise activity in the local bourse as daily trading volume shrank further by 11% q-o-q.

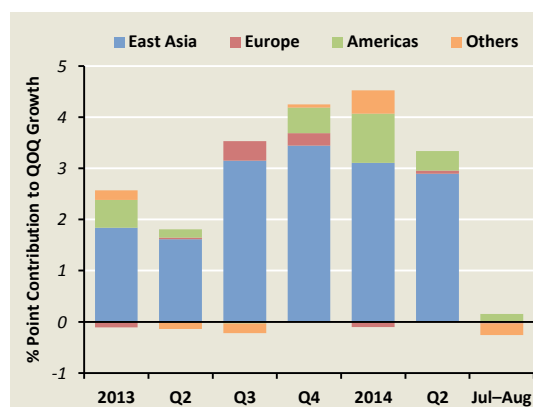
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**The domestic-oriented industries eased in Q3 as construction works in the private segment tapered off.**

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Domestic-oriented activities slowed significantly in Q3 2014, following firm growth in the first half of the year. The tepid performance was due, in part, to the weakness in construction activity, which saw two consecutive quarters of contraction in Q2 and Q3 2014. While construction certified payments for the private segment were reduced by the slowdown in the

**Chart 2.5**  
**ACU Non-bank Lending**

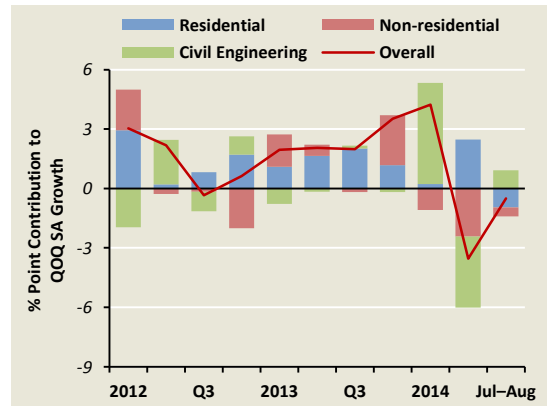


residential property market, recent delays in public sector projects, such as the Ng Teng Fong General Hospital, compounded the downturn. (Chart 2.6) Moreover, the upward revisions to foreign worker levies in July also weighed on the sector.

Consumer-facing services were likewise subdued, with overall retail sales remaining flat. Excluding motor vehicle sales, which were lifted by new model launches and declining COE prices, retail sales were lacklustre with sales of discretionary items, such as furniture and household equipment, experiencing declines. (Chart 2.7)

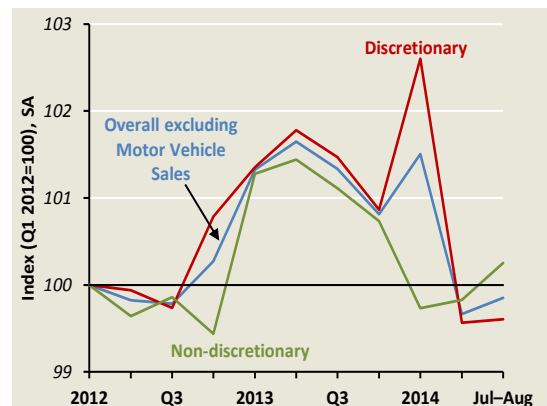
However, the hospitality sector was a bright spot in July, with tourist arrivals expanding by 3.3% m-o-m SA, after contracting by 5.7% q-o-q SA in Q2 when sentiment was dampened by two major airline disasters. Following the recovery in tourism, hotel occupancy rates climbed to 87% SA in Jul–Aug after averaging 84% in Q2, with average daily room rates rising to levels reached before the dip in tourist arrivals in March this year.

**Chart 2.6**  
**Certified Construction Payments**



Source: EPG, MAS estimates

**Chart 2.7**  
**Retail Sales Volume**



## 2.2 Economic Outlook

### On Track for Moderate Growth Despite Some Headwinds

The Singapore economy is expected to proceed on a moderate growth trajectory over the next few quarters. While some segments within the external-oriented sectors should benefit from the uplift in the US economy, certain pockets of activity will be subject to sluggish demand in the Eurozone and China. Similarly, within the domestic-oriented sectors, performance will also be uneven. While higher labour costs could continue to weigh on margins, some segments will stay resilient on the back of strong underlying demand. The move up the value chain towards high-margin activities, particularly in the manufacturing sector, will take place alongside these cyclical developments.

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**The Singapore economy is likely to proceed at a steady clip alongside the recovery in the global economy.**

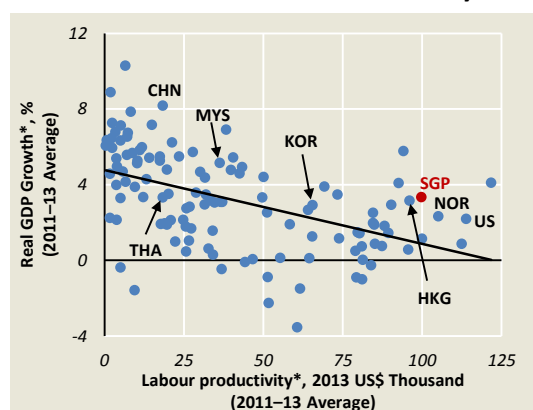
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The interplay between cyclical and structural factors over the last two years has resulted in increasing complexities in Singapore's growth dynamics.

Going forward, the unevenness in growth performance is anticipated to persist. On the external front, the global economy will largely be driven by the US, as explained in Chapter 1. Thus, sectors that cater to final demand in the US will fare relatively favourably, while those that are tied to the Eurozone and China could be weighed down by the sluggish performance in these economies. Concomitantly, some of these external-facing industries will continue to grapple with resource constraints and falling product prices. Meanwhile, domestic-oriented sectors will remain resilient on the back of firm underlying demand, although those segments that are more reliant on labour input, or face greater competition, could experience profit margin pressure.

The net outcome is a GDP growth forecast of 2.5–3.5% for this year, and a broadly similar pace for 2015. This should be seen in the context of the domestic economy settling down to a slower, but more sustainable growth path. With Singapore's relatively high real GDP per capita of US\$61,100 and labour productivity of US\$99,900 on a PPP-adjusted basis (as at 2013), the moderation in the medium-term growth rate is in line with global experience. (Chart 2.8)

**Chart 2.8**  
**Cross-country Comparison of Real GDP Growth and Labour Productivity**



Source: The Conference Board Total Economy Database and EPG, MAS estimates

\* Real GDP growth and labour productivity levels are on a 2013 US\$, PPP-adjusted basis.

### The global recovery rests largely on a single growth driver, constraining a broad-based cyclical recovery in Singapore's external-oriented sectors.

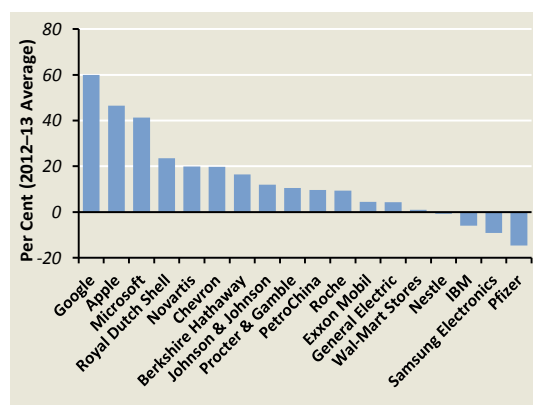
Following the modest pickup in Q3 2014, the Singapore economy is projected to grow at a moderate pace for the rest of 2014 and in 2015. On the external front, the profile of recovery will remain uneven, with the US economy as the main engine of global growth.

As discussed in the last *Review*, Singapore's economic prospects are tied more closely to investment than consumption demand in the US. Having been persistently below trend since the GFC, the US capex cycle appears to be gaining traction with private non-residential GFCF in equipment slightly above pre-crisis levels (as a percentage of GDP) in Q2 2014.

Standard & Poor's *Global Corporate Expenditure Survey*<sup>1</sup> suggests that the growth in equipment spending was supported mainly by the telecommunications and IT industries. Capital spending in the telecommunications sector was spurred by investments in 4G wireless networks while spending in the IT sector was driven by large corporates such as Google and Microsoft investing heavily in new technologies centred around cloud computing. The capex spending of top global firms highlights that tech giants, such as Microsoft and Google, have seen the strongest growth over the last two years. (Chart 2.9) More recently in Q2 2014, IT private fixed asset investments expanded by 6.0% q-o-q SA, the fastest pace recorded since Q4 2012. In turn, this prompted an increase in imports of electronics products, such as PCs and servers over the same period. (Chart 2.10)

A closer look at the recent pickup in US IT investment shows that it appears to be limited to particular segments. A report by Gartner, an industry research firm, suggests that the uplift has largely been driven by density-optimised servers, used to equip hyper-scale data centres. More broadly, demand for enterprise servers and PCs are expected to remain modest despite corporate upgrades to newer versions of the Windows platform. Major IT firms, such as Hewlett Packard, remain circumspect about the levelling out of the declining PC cycle and caution that revenue gains from the corporate refresh could be short-lived. Long-term trends, such as the shift towards mobiles, tablets and

**Chart 2.9**  
Global Top 18 Non-financial Corporates' Capital Expenditure Growth



Source: Bloomberg, Confederation of British Industry

**Chart 2.10**  
US IT Investment and Imports



Source: CEIC and EPG, MAS estimates

<sup>1</sup> Standard & Poor's Ratings Services (2014), *Global Corporate Capital Expenditure Survey 2014*, McGraw Hill Financial.



cloud-related infrastructure will continue to cannibalise PC sales. Gartner forecasts that shipments of desktop PCs and notebooks will likely remain on a secular downtrend and continue to contract this year.<sup>2</sup>

Meanwhile, relatively muted demand in Europe and China could cap prospects for commodities, which would, in turn, weigh on merchanting trade and transport & storage activities in Singapore. The recent declines in commodity prices have compressed the margins of offshore trading firms, while the bottom lines of shipping operators were also squeezed by persistently low freight rates. Moreover, these weak outcomes could have negative spillovers on other sectors, such as financial services.

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**A secular shift away from resource-intensive activities to high-margin activities is evident within the manufacturing sector.**

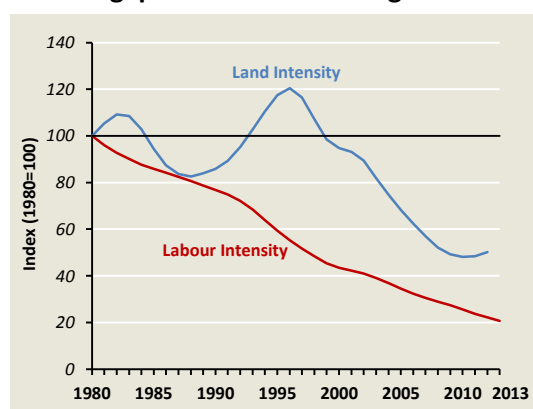
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Apart from the uneven external recovery, firms in the external-oriented sectors, particularly the manufacturing sector, will have to adjust to ongoing domestic resource constraints and falling global prices for specific product lines.

Over the last two decades, Singapore-based manufacturers responded to limitations in supply-side resources by moving away from land- and labour-intensive to capital-intensive activities. Notably, labour intensity experienced a two-decade long secular decline as Singapore's industrialisation policies focused on increasing capital intensity in production. (Chart 2.11) Over 1980 to 2013, steady labour productivity growth enabled manufacturing firms to increase output volume by over six times while employment grew by less than 50%. Meanwhile, land intensity per unit of output also fell with greater value added produced with the same amount of land resource, as companies scaled up the value chain.

The persistent climb up the rungs of the value-added ladder is reflected in the rise in capital and skill intensity of our export basket.<sup>3</sup> (Chart 2.12) Mapping Singapore's exports against the benchmark of manufactured goods in the US, where capital and skill intensity data is available, shows that the products from Singapore have risen in both capital and skill

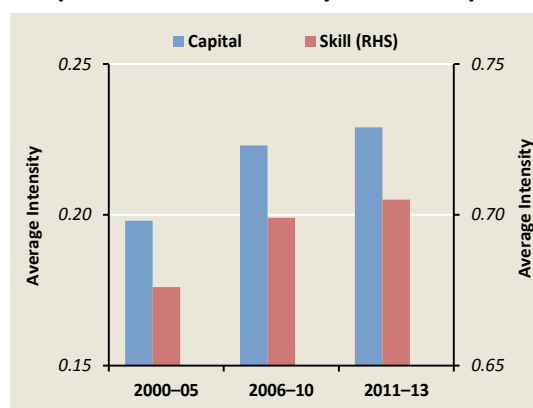
**Chart 2.11**  
**Land and Labour Intensity of Output in Singapore's Manufacturing Sector**



Source: EPG, MAS estimates

Note: Land intensity is estimated by the amount of real capital expenditure on land, buildings and structures per unit of real total output. Labour intensity is measured using employment per unit of real total output. Both series are smoothed using the Hodrick-Prescott filter and indexed to 1980.

**Chart 2.12**  
**Capital and Skill Intensity in Total Exports**



Source: Bureau of Labour Statistics, Feenstra, Lipsey SITC-NAICs trade data, NBER-CES Manufacturing Industry Database and EPG, MAS estimates

<sup>2</sup> Gartner, Inc. (2014), *Forecast: PCs, Ultramobiles and Mobile Phones, Worldwide, 2011-18, 2Q14 Update*.

<sup>3</sup> Capital intensity is measured by the ratio of capital to labour input while skill intensity is proxied by the ratio of PMET workers to total employment.



intensity from an average of 0.20 and 0.68 respectively in the early 2000s to 0.23 and 0.71 during 2011–13.

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**Electronics has been a major driver of the transformation of Singapore’s manufacturing sector towards higher value-added activities.**

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A key driving force behind Singapore’s ascent up the manufacturing value chain is the continual transformation of the domestic electronics industry. Since the 1990s, electronics has accounted for around 50% of non-oil domestic exports and 40% of manufacturing output on average. Its persistently large weight in the economy reflects the success of Singapore’s IT industry in making the necessary structural shifts over the past two decades. Broadly, this evolution can be characterised into three phases. (Chart 2.13)

During the first phase which spanned the early 1980s to the late 1990s, the production of disk drives and info-communications devices were the primary anchors of growth. In fact, Singapore produced 80% of the world's disk drives up to the early 1990s.

In the second phase, starting from around the turn of the millennium, production of traditional hard disk drives diminished in importance while domestic IT manufacturing became increasingly geared towards the production of higher value-added semiconductors. (Chart 2.13) During this phase, major disk drive manufacturers such as Seagate and Maxtor scaled down their operations in Singapore and relocated to lower-cost countries such as Malaysia and Thailand. At the same time, players such as Micron, UMC and GlobalFoundries made heavy investments in wafer fabrication plants in Singapore. Consequently, the export share of disk drives fell while the share of semiconductors rose significantly. Despite substantial land and capital requirements, wafer fabrication plants offered good returns on investment given the high-margin products produced. Moreover, semiconductor production activity generated positive spillovers to other industries, such as precision engineering and trade-related services.

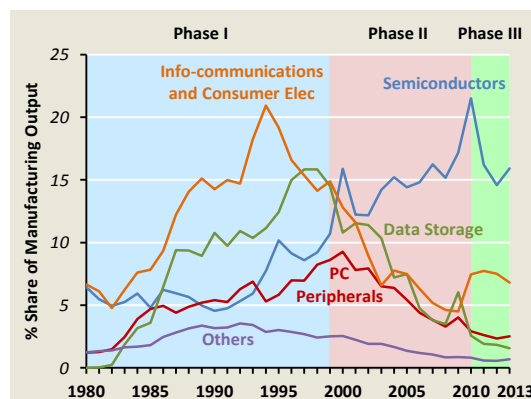
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**The most recent phase marks a shift from mass production to niche production and services.**

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In recent years, a combination of factors, including domestic supply-side constraints and weak external demand, have induced changes to some segments

**Chart 2.13**  
Singapore’s Electronics Output  
by Product Type



within the domestic IT industry. On the cost front, the uptick in business costs was largely driven by a rise in operating expenses due to increases in utilities, transportation and other operating costs such as outsourcing and R&D expenditures. (Chart 2.14) Likewise, remuneration costs inched up as a result of a growing proportion of skilled labour.

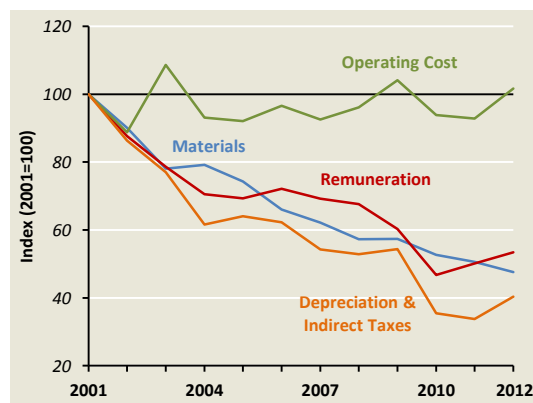
Concomitantly, some local IT producers were also confronted with falling global prices in specific product lines. This has prompted them to recast their business model by shifting towards higher-value production. Indeed, Chart 2.15 shows that electronics was one of the few categories with a T-index exceeding parity, indicating that the unit export value of IT goods rose during the 2011–13 period on average.<sup>4</sup> Specifically, over the past three years, the move towards higher-margin semiconductor production, evident by a growing focus on 300mm wafer fabrication and specialised chips used in smartphones, automotive engines and electronic passports could have contributed to the rise in price premiums.

Apart from niche production, there has been a growing impetus among locally-domiciled IT producers to place greater emphasis on activities, such as chip design, delivery of IT services and innovative solutions.

The increasing prominence of manufacturing-related services is evident in compositional shifts within Singapore's export basket. In particular, while the value of electronics domestic exports fell over the past three years, this was accompanied by a marked increase in exports of IT-related services. (Chart 2.16)

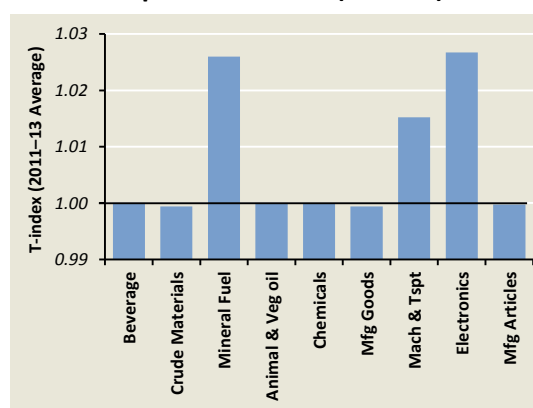
As the nature of manufacturing evolves to become more skill- and capital-intensive, the shift to services-related activities described in the last *Review* will continue. This is represented by a stylised "Smile Curve"<sup>5</sup> which shows the typical margins along

**Chart 2.14**  
Unit Business Cost Outlays of Domestic IT Producers



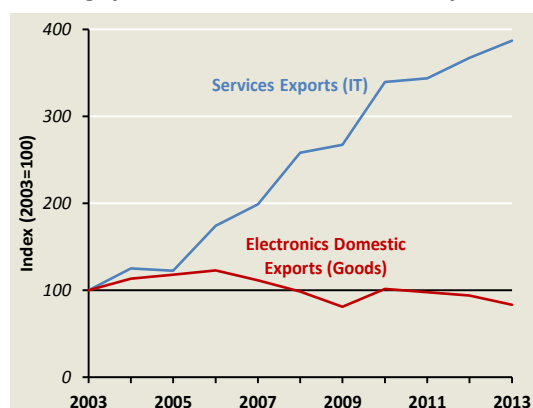
Source: EPG, MAS estimates

**Chart 2.15**  
Export Unit Value (T-Index)



Source: EPG, MAS estimates

**Chart 2.16**  
Singapore IT Goods & Services Exports



<sup>4</sup> The T-index is a chain-weighted index that measures the average price of exports. It is the geometric average of the price in period  $t$  relative to the preceding period, weighted by the shares across the two periods. Thus, it is able to account for dynamic shifts in the export basket as opposed to the traditional export price index, which is based on a fixed basket of goods and services.

<sup>5</sup> The Smile Curve was coined by former chairman of Acer Inc., Stan Shih, to describe the phenomenon of U-shaped profitability along the manufacturing supply chain.

the manufacturing supply chain. (Chart 2.17) The response by firms has been characterised by a leftward shift into upstream activities such as R&D, and a rightward shift into more downstream services. For example, there has been an increase in the number of fabless semiconductor firms based in Singapore looking to expand their R&D and supply chain management operations. The share of total electronics output accounted for by these fabless semiconductor firms doubled from 11% to 23% between 2010 and 2012 (Chart 2.18), and the services content of Singapore's production output has also been on the rise. (Chart 2.19)

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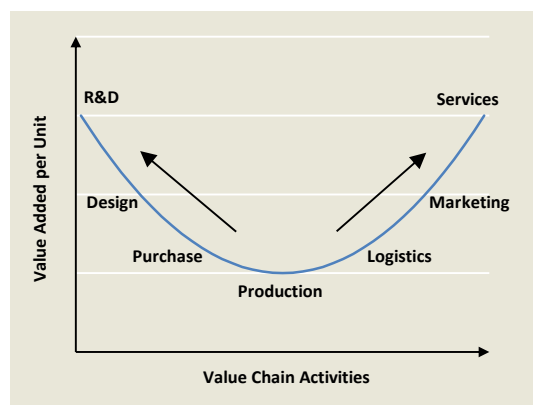
**Global shifts in the IT industry towards cloud computing should bolster manufacturing-related services.**

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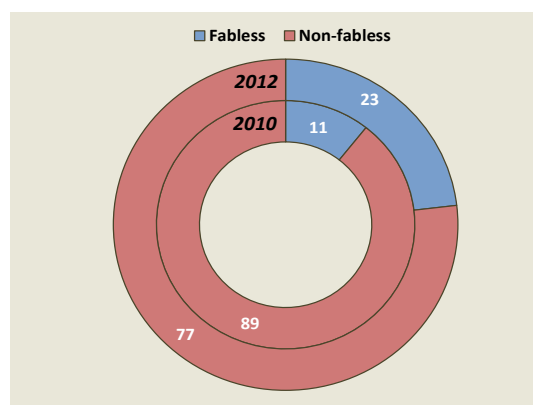
Global trends are also favourable to the development of these services-related industries in Singapore. Manufacturing-related services, for instance, should be able to leverage on the rise of cloud technology, which has emerged as one of the fastest growing branches of the global IT industry.

Expenditure on IT services (including cloud services) is projected to account for over a third of growth in worldwide IT spending over 2014–18. Encouragingly, some top IT firms in Singapore have indicated their intention to expand. Following the launch of Google's data centre in the Data Centre Park this year, the 13-hectare site is expected to attract even more multinational corporations and enterprises to establish their data centre facilities there. These developments are anticipated to generate positive spillovers to the information & communications sector in Singapore, particularly in IT services, data storage and management. Indeed, there has been a surge in demand for info-communications services in recent years, with IT services revenues expanding by an annual average rate of 20% in 2012–13, compared to 1.1% over 2010–11.

**Chart 2.17  
Stylised Smile Curve**

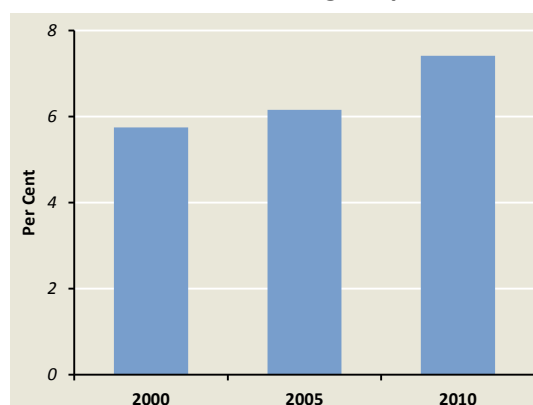


**Chart 2.18  
Share of Fabless Firms in Singapore's Electronics Output (%)**



Source: DP Information Group Singapore 1000 Database and EPG, MAS estimates

**Chart 2.19  
Share of Services Inputs in Manufacturing Output**



Source: EPG, MAS estimates

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**Singapore's services continue to rank favourably in the region and are positioned to benefit from inward investment.**

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Singapore continues to retain a competitive advantage in services, and is ranked favourably among regional competitors in services exports. Growth in sectors such as ICT and financial services has outpaced some of the NEA-3 economies during the latter half of the decade. (Chart 2.20)

Direct investments into the services sectors from developed economies such as the US have benefitted Singapore significantly. Investments from the US into Singapore's modern services sectors<sup>6</sup> have grown at an average pace of 22% over 2011–13. Within Asia, Singapore has become a key investment node for US firms in these services, accounting for 21% of direct investment into Asia ex-Japan during 2011–13, compared with 11% in the 2000s. (Chart 2.21) In 2013, 73% of US modern services investment in Singapore went into the financial services sector, while information services (including software publication, telecommunications, data processing, hosting and related services) accounted for 23%.

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**Domestic-oriented activities will be resilient despite some margin compression and an expected moderation in construction-related activities ...**

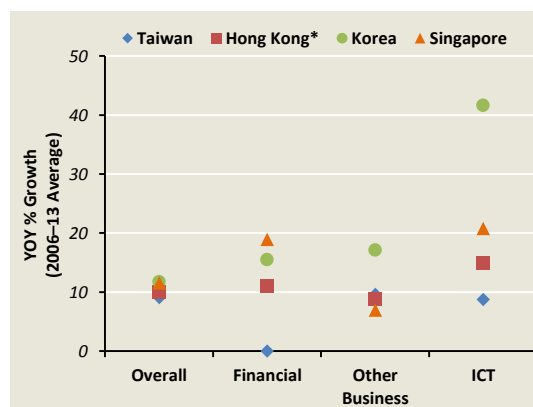
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Meanwhile, the domestic-oriented sectors will continue to see positive growth, albeit at a slower pace. Specifically, construction activities in the private segment will taper off. Contracts awarded for the private segment remained flat over the Jul–Aug period, reflecting weakening demand in both the residential and non-residential segments. This would have spillovers on real estate-related business services.

In addition, higher labour costs will continue to exert downward pressure on the profit margins of the domestic-oriented firms, given the labour-intensive nature of their activities and keen competition. Foreign maid agencies and smaller retailers in clothing and footwear are some of the segments that saw prices decline despite higher costs.

However, businesses with larger operations generally appear to have been able to pass on the cost increases to consumers. Even though the unit labour costs of

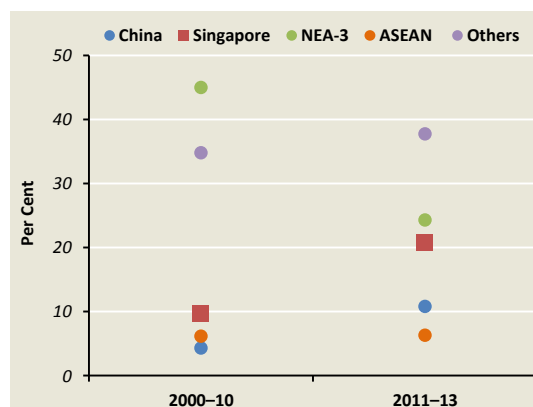
**Chart 2.20**  
**Exports of Services**



Source: WTO and EPG, MAS estimates

\* Growth rates for Hong Kong in the Other Business Services and ICT categories are up till 2012.

**Chart 2.21**  
**Average Share of US Services FDI in Asia ex-Japan**



Source: Bureau of Economic Analysis and EPG, MAS estimates

<sup>6</sup> Modern services include financial services, information services and professional, scientific and technical services.

these firms have risen significantly, the domestic-oriented sector's GDP deflator continued to register positive growth in recent years, and even outpaced the economy-wide average. (Chart 2.22) The strength of these industries is also evident at the firm level. Median earnings before interest and taxes (EBIT) margins of listed firms in the domestic-oriented sector, which tend to be the larger companies, remain high at 13% between 2011 and Q2 2014. More broadly, the domestic-oriented sector remains dynamic, as reflected in the net formation of 6,708 companies in H1 2014, an 11% increase from the preceding half-year period.

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**... with support coming from rising consumption of essential goods and services.**

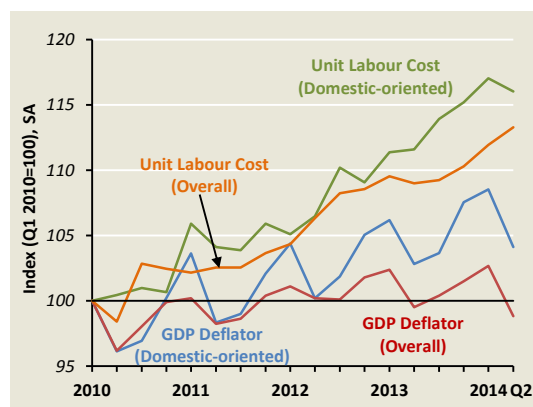
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The resilience of these firms reflects strong underlying demand on the back of a growing population base and rising income levels. From an expenditure perspective, total real private consumption expenditure has recorded steady gains following the GFC. Chart 2.23 shows that private consumption growth was underpinned by the expansion in the population base in the latter half of the 2000s. However, in recent years, private consumption growth has been increasingly driven by the rise in consumption per capita instead. This switch in growth drivers reflects the underlying shift in consumption patterns amid rising affluence and a more sophisticated populace.

Based on the *Household Expenditure Survey*, average real monthly household expenditure per capita<sup>7</sup> rose by 16% between 2008 and 2013, in tandem with income. Notably, the increase in discretionary spending significantly outpaced that of essentials, with real expenditure on discretionary services surging by 61% over the five-year period. This was due to the greater ability and willingness of consumers to spend on services such as insurance, air transport and restaurant and cafe dining. Over the same period, real expenditure on health insurance per capita increased by more than three-fold. This is corroborated by the 30% jump in the number of MediShield policyholders with private integrated shield plans between 2008 and 2012.

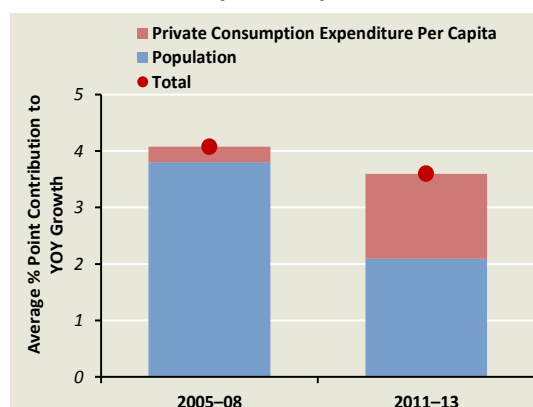
<sup>7</sup> This refers to the average monthly household expenditure (excluding expenses on housing) per member of a household of four people—the median household size in Singapore. Data is based on DOS (2014), *Report on the Household Expenditure Survey 2012/13*.

**Chart 2.22**  
**GDP Deflator and Unit Labour Cost**



Source: EPG, MAS estimates

**Chart 2.23**  
**Decomposition of Real Private Consumption Expenditure**



Source: EPG, MAS estimates

Over the longer term, private consumption expenditure has broadly tracked resident wage developments. (Chart 2.24) With local wages projected to grow at a relatively healthy pace in the coming year, private consumption is expected to remain firm, notwithstanding transitory fluctuations in the more sentiment-driven discretionary expenditures.

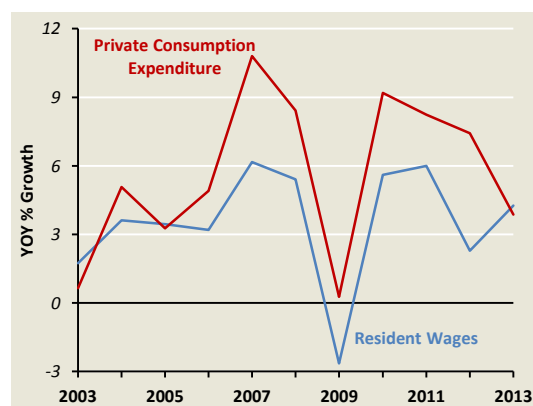
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**The Singapore economy will grow moderately as businesses adjust to higher productivity and more capital-intensive production.**

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The domestic economy should record continued, albeit muted gains for the rest of this year, and embark on a moderate growth trajectory in 2015. Resource constraints amid intermittent external headwinds will temper growth, but as firms leverage more intensively on capital and skills, the transitional costs during the adjustment phase will ebb. Higher productivity and more capital-intensive modes of production will provide a firmer basis for Singapore's future growth prospects.

**Chart 2.24**  
**Private Consumption Expenditure and Resident Wages**



## Box A

## Do Professional Forecasts in Singapore Contain Useful Information?

The prognostications of professional economic forecasters are often given wide coverage in the press as their forecasts of key macroeconomic variables may be a useful source of information on the near-term outlook. Using data from the *US Survey of Professional Forecasters* and the *Livingston Survey*, Leduc and Sill (2013) found that the predictions of experts contain quantitatively important information about future economic activity. This Box shares some results from a similar exercise for Singapore, based on projections from the *MAS Survey of Professional Forecasters*. It sets out specifically to analyse whether local economists' short-term forecasts of GDP growth, the unemployment rate and inflation can help in predicting the future evolution of these variables.

**MAS Survey of Professional Forecasters**

The *MAS Survey of Professional Forecasters* (SPF) was first conducted in Q4 1999, with the aim of establishing a consistent benchmark for private sector forecasts of key economic variables that are relevant to the Singapore economy. With this objective in mind, the views of close to thirty respondents were collated every quarter on a host of indicators, the most important of which are real GDP growth, the unemployment rate and CPI inflation. Survey questionnaires were sent to participants after the *Quarterly Economic Survey of Singapore* was released to the public, so forecasters would have knowledge of the economic data for the preceding quarter when making their projections. For the purpose of this study, only one-quarter ahead median forecasts are utilised, although the SPF includes predictions for the current and next calendar years.<sup>1/</sup>

As discussed in a previous issue of the *Review*, survey participants in the SPF appear, on the whole, to be rational, as their predictions were generally unbiased and efficient with regard to incorporating the latest information.<sup>2/</sup> The focus of this Box is on examining whether participants' forecasts contain additional information, over and above that found in the key indicators that are routinely monitored by professional economists. In order to do this, we used vector autoregressions (VARs) that include conditioning variables. Since it would be unfair to hold forecasters accountable for information they do not have when making predictions in real time, the first vintage of reported macroeconomic data is used as benchmarks i.e. preliminary estimates which are released approximately one month after the end of each quarter.

**Baseline VAR Models and Results**

Three baseline VAR models are estimated for the SPF forecasts of real GDP growth, unemployment rate and inflation. Each of the models include the preliminary outturns of real GDP growth, the unemployment rate ( $U$ ) and the CPI inflation rate, as well as the Purchasing Managers' Index ( $PMI$ ) and the growth rate of the S\$NEER. Quarterly data is used and the sample period is Q4 1999 – Q2 2014.<sup>3/</sup> Our strategy is to examine how a positive innovation to the forecast, interpreted as an autonomous shift in forecasters' collective expectations, presage the actual outturns in the same quarter. For example, the variables in the model for real GDP growth are:

$$\{GDP_t^f, GDP_t, PMI_t, U_t, CPI_t, NEER_t\}$$

where  $GDP_t^f$  is the SPF forecast made at time  $t$  for GDP growth and  $GDP_t$  is the preliminary estimate of GDP growth in the same quarter.<sup>4/</sup>

<sup>1/</sup> The results were very similar when mean forecasts were used instead.

<sup>2/</sup> See Special Feature A of the April 2007 issue of the *Macroeconomic Review*.

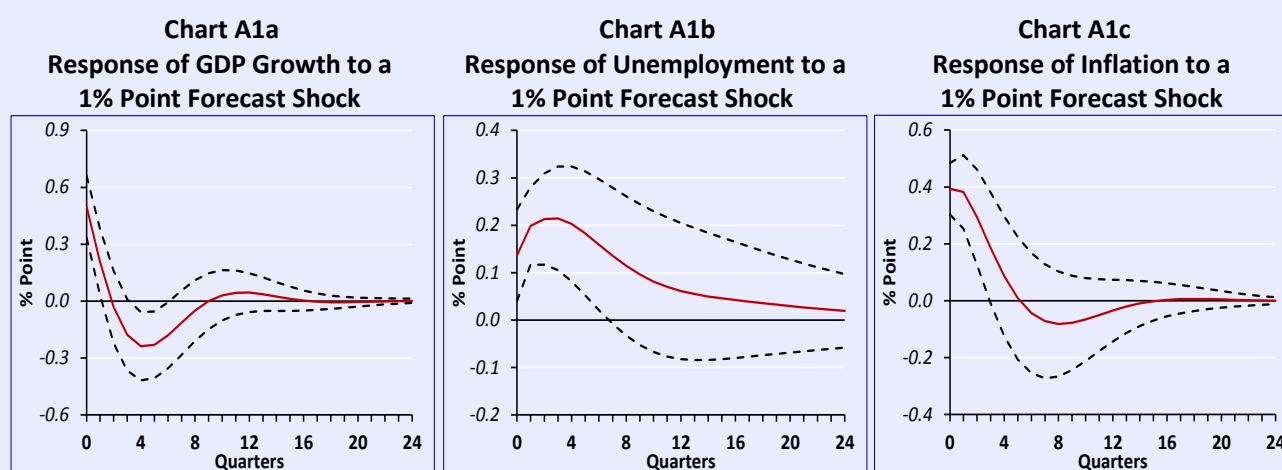
<sup>3/</sup> Forecasts for the unemployment rate are from Q1 2000 onwards, while forecasts for GDP growth and inflation begin in Q4 1999.

<sup>4/</sup> By convention, we label the forecast as a one-quarter ahead projection even though it refers to the growth rate of the quarter in which it was made.



For identification purposes, the expectations variable is placed first, in line with Leduc and Sill (2013), since the information set on which survey participants base their forecasts will not include, by construction, the time  $t$  observations of the other variables. As in most small-scale VAR models of the macroeconomy, this is followed by real indicators and prices, with the policy variable ordered last.

Charts A1a to A1c present the impulse responses of real GDP growth, the unemployment rate and CPI inflation in the baseline VAR models to innovations in forecasters' expectations of the corresponding variables. The responses are traced out for 24 quarters and are accompanied by 95% asymptotic confidence bands. Chart A1a shows that a 1% point increase in the SPF median forecast of GDP growth typically gives rise to a 0.5% point increase in actual GDP growth in the same quarter. Similarly, a 1% point rise in expected unemployment and inflation leads to a 0.14% point and a 0.39% point increase in the current unemployment and inflation outcomes, respectively. (Charts A1b and A1c) The impact on current GDP growth is significant for up to two quarters, while the effects on unemployment and inflation persist longer.



Source: EPG, MAS estimates

Note: Dashed lines represent 95% confidence bands.

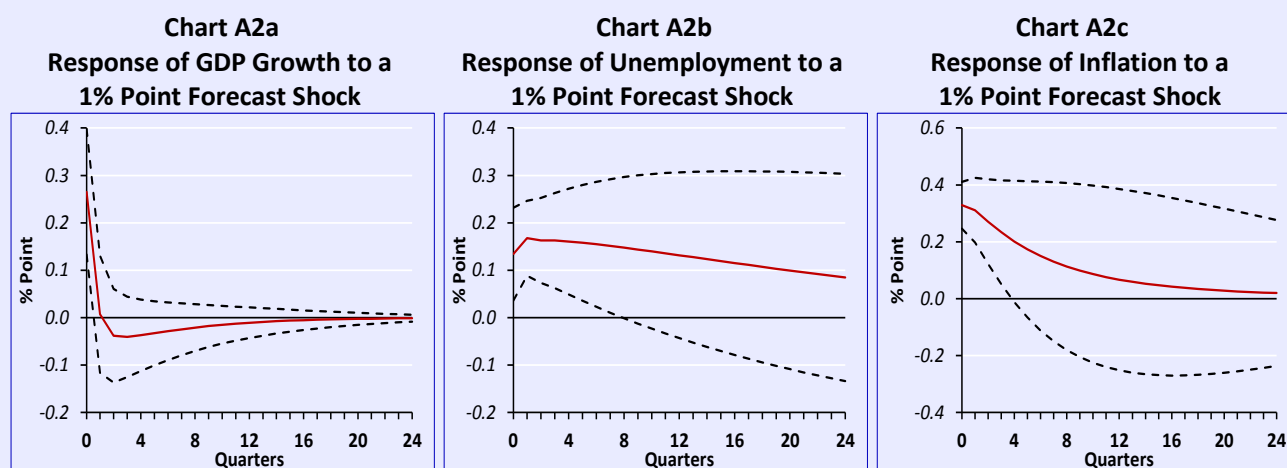
Although the magnitude and degree of persistence differ across variables, the VAR results suggest that shifts in forecasters' expectations of future activity and prices appear to have a bearing on the actual outcomes. A possible explanation, postulated by Leduc and Sill (2013) for the US economy, is that survey expectations contain relevant information that is not reflected in current fundamentals. In other words, professional forecasters receive news through the latest data releases and condition their projections on them. In the case of inflation, however, agents' expectations may directly affect realised outcomes. For example, during the wage bargaining process, workers may take into account anticipated price increases, which then feed into higher current and future inflation.

### ***Extensions of the Baseline Models***

The baseline VAR models estimated above may not have fully accounted for exogenous influences on the Singapore economy. In particular, the outlook for the global economy and worldwide electronics industry is likely to have a significant impact on SPF participants' expectations of domestic GDP growth, unemployment and inflation. As a robustness check, the baseline VAR models were re-estimated with the addition of three exogenous variables: changes in the Brent crude oil price, foreign GDP growth and global chip sales growth.

Charts A2a to A2c plot the impulse responses for the extended VAR models. The results are broadly similar to the baseline case, although the effects of the shocks are now more muted. A 1% point rise in the one-quarter ahead GDP growth forecast now induces a 0.27% point increase in actual GDP growth in the same quarter. (Chart A2a) Similar innovations to the unemployment and inflation rates lead to a 0.13% point, and a 0.33% point, increase in actual unemployment and inflation, respectively. (Charts A2b and A2c)

Using a confidence band of 95%, the impact on GDP growth is significant up to one quarter, while the effects of the shocks on inflation and unemployment are statistically different from zero for the following four and eight quarters, respectively. Thus, even after controlling for possible omitted exogenous variables, changes in expectations still feature as significant drivers of economic fluctuations in Singapore.



Source: EPG, MAS estimates

Note: Dashed lines represent 95% confidence bands.

### Variance Decomposition

The forecast error variance decomposition can be used to assess the information content of expectations variables for forecasting purposes. Table A1 shows the proportion of the changes in current GDP growth, the unemployment rate and inflation rate accounted for by autonomous shifts in their corresponding forecasts. The variance decompositions at the one-year and five-year ahead forecast horizons are shown for both the baseline and extended models, together with their associated confidence intervals, and they corroborate the earlier finding that the forecast variables have predictive power. For instance, at the one-year ahead horizon, expectational shocks contribute 18.5%–29.3% to the forecast error variance of GDP growth. In the case of inflation, the explanatory power of the forecast innovations is significantly higher, accounting for 51.4%–53.4% of the variation in actual outcomes.

At the five-year horizon, the impact of expectational shocks on GDP growth and unemployment are broadly unchanged compared to the one-year horizon, accounting for 16.9%–31.6% and 32.5%–33.9% of their respective forecast error variances. However, the contribution of inflation forecast shocks to actual outcomes at the five-year horizon falls to 24.7%–35.6%.

**Table A1**  
Contribution of Expectational Shocks to GDP Growth, Unemployment and Inflation

	GDP Growth		Unemployment Rate		Inflation Rate	
	Baseline Model	Extended Model	Baseline Model	Extended Model	Baseline Model	Extended Model
One-year ahead	29.3 (21.9, 36.6)	18.5 (14.2, 22.8)	33.9 (32.4, 35.3)	26.2 (25.0, 27.5)	51.4 (48.1, 54.7)	53.4 (50.7, 56.0)
Five-year ahead	31.6 (22.9, 40.4)	16.9 (12.4, 21.5)	32.5 (30.2, 34.8)	33.9 (31.4, 36.4)	35.6 (31.5, 39.7)	24.7 (19.7, 29.7)

Note: Figures are in percentages. Numbers in parentheses indicate the 95% confidence interval.

**Sum-up**

According to our analysis, market participants in Singapore appear to provide additional insights into near-term movements in real activity and prices, above and beyond their recent history and after allowing for the effects of exogenous shocks. In particular, the *MAS Survey of Professional Forecasters* incorporates useful information on economic activity that is not found in commonly monitored variables and, therefore, has inherent predictive value.

**References**

Leduc, S and Sill, K (2013), “Expectations and Economic Fluctuations: An Analysis Using Survey Data”, *Review of Economics and Statistics*, Vol. 95(4), pp. 1352–1367.

Monetary Authority of Singapore (2007), “Assessing the Performance of Professional Forecasters”, *Macroeconomic Review*, Vol. VI(1), pp. 74–84.