2 The Singapore Economy

- The Singapore economy expanded modestly in Q3 2022, supported in part by industries which continued to benefit from the reopening of borders. At the same time, there are signs of underlying weakness in the key external-facing sectors, with the manufacturing and financial sectors underperforming prior expectations.

- Amid weakening external demand prospects, the global electronics cycle is on the brink of a downturn. Global chip sales began to contract in early Q3, even as inventory continued to grow. Consumer demand for electronic devices in Singapore's top two final-demand markets, China and the US, has contracted, adversely impacting Singapore's electronics exports in recent months. Apart from slower demand, the domestic semiconductor industry is also grappling with soaring energy costs. Meanwhile, the recovery in the travel-related and consumer-facing sectors should continue in the near term, but their growth momentum will ease as pent-up demand from economic reopening dissipates.

- GDP growth is estimated to come in at 3–4% in 2022, and moderate to a below-trend pace in 2023. Compared to the trade-driven growth in 2021, there has been a rebalancing of growth drivers this year with broad-based contributions from the trade-related, modern services, domestic-oriented and travel-related clusters. As external demand continues to slow, the trade-related sectors could pose a drag on growth in 2023.

- This chapter also reports on a firm-level analysis of the economy's underlying financial resilience, which is found to be robust for the majority of firms included in the study. However, productivity performance and spending on R&D vary significantly across businesses and sectors.

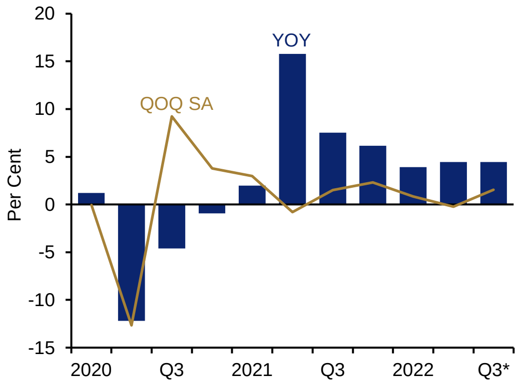
2.1 Recent Economic Developments

The Singapore economy expanded in Q3, following the mild contraction in the previous quarter

Domestic economic activity contracted by 0.2% q-o-q SA in Q2 2022, before registering a 1.5% expansion for Q3 in the *Advance Estimates* **(Chart 2.1)**. The decline in Q2 was due to the sluggish performance in the external-facing sectors, even as the domestic-oriented and travel-related industries benefited from pent-up demand with the lifting of border and domestic mobility restrictions. This trend generally continued into Q3, with activity continuing to gain from the reopening of the economy **(Chart 2.2)**. However, the manufacturing and financial services sectors underperformed expectations amid softening external demand. As of Q3 2022, aggregate GDP was 7% above its pre-COVID level in Q4 2019, and had returned to its pre-pandemic trajectory, i.e., the present level of GDP envisaged before the onset of COVID in January 2020.

Chart 2.1 GDP expanded by 1.5% q-o-q SA in Q3 2022, reversing the 0.2% decline in Q2

Singapore's GDP growth

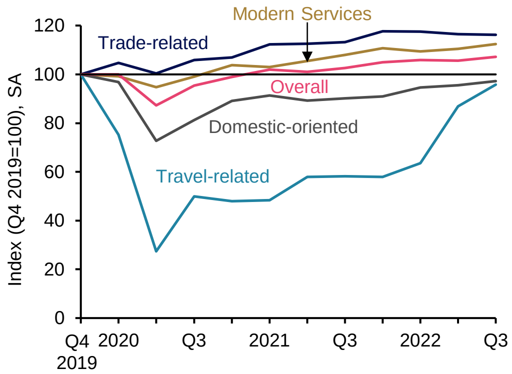


Source: DOS

* *Advance Estimates*

Chart 2.2 Travel-related and domestic-oriented sectors saw strong recovery in recent quarters

GDP profile by sector



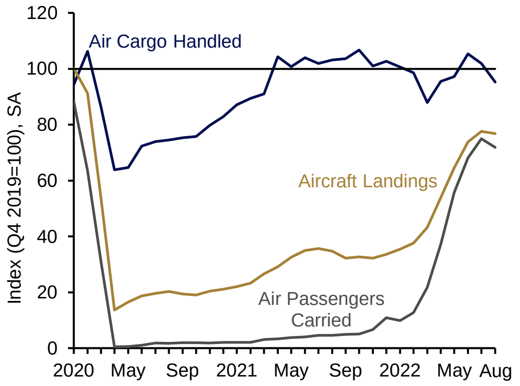
Source: EPG, MAS estimates

Growth in recent quarters was underpinned by sectors that benefited from the reopening of borders

Travel-related activities staged a marked improvement in Q2 and Q3, as Singapore reopened its borders to all vaccinated travellers since early April. Notably, average monthly air passengers carried more than tripled in Q2 from Q1 and rose further by 37% in Jul–Aug **(Chart 2.3).** Compared against pre-COVID levels in Q4 2019, this represented a significant increase from 15% in Q1 2022 to 73% in Jul–Aug. Concomitantly, average monthly visitor arrivals surged fivefold in Q2 from the quarter before and increased further by 78% to 744,496 in Q3. While slightly over half of the increase in arrivals in Q2 was attributed to ASEAN visitors, contribution from other regions such as Europe and Northeast Asia grew to more than half in Q3. In the accommodation sector, hotel occupancy rates rose by 12% points to 73% in Q2 and further to 79% in Jul–Aug, with broad-based increases across the different hotel tiers **(Chart 2.4)**. As the government continued to taper its room bookings for quarantine purposes, tourist and staycation activities were the main support for the accommodation industry.

Chart 2.3 The number of air passengers carried has rebounded in recent months

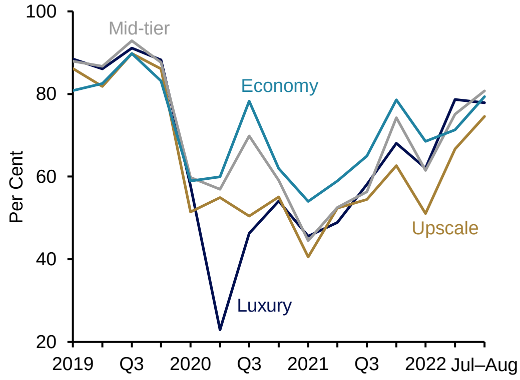
Air transport indicators



Source: CAAS and Haver Analytics

Chart 2.4 Hotel occupancies have generally improved across all tiers

Hotel occupancies



Source: STB

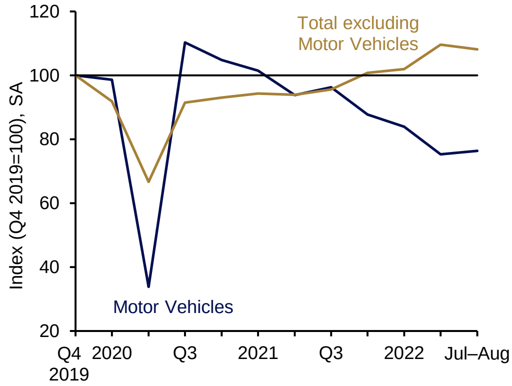
Meanwhile, administrative & support services contracted by 2.1% q-o-q SA in Q2 on account of weakness in the rental and leasing segment. However, the sector likely expanded in Q3, bolstered by tour operators, events, and concert organisers, as tourist arrivals rose and major events were lined up for the F1 Singapore Grand Prix in September. Singapore's MICE activities have also benefited from a diversion of demand from elsewhere in the region, including Northeast Asia where tighter COVID-19 restrictions remained. The professional services sector registered strong outturns in the past few quarters, underpinned by head office functions and consultancy-related activities, as the easing of travel restrictions globally facilitated firms' engagements with overseas clients.

Similarly, the consumer-facing sectors recovered further. Although retail sales declined sequentially in Q2, it was mainly driven by weakness in motor vehicle sales amid rising COE premiums **(Chart 2.5)**. The F&B sector expanded strongly, underpinned by growth in activities of restaurants and food caterers, with the return of more people to the workplace and lifting of group size limits on dining out **(Chart 2.6)**. The resumption of international travel and major events likely boosted tourists' spending on discretionary items in Q3 as well. This would have helped offset some pullback in local spending by residents, including on staycations and recreation & entertainment, as they pivoted towards travelling and spending abroad.

Residents' resumption of international travels from Q2 2022 is estimated to have propelled overall private consumption expenditure back to its pre-pandemic levels. However, household expenditure patterns have shifted from pre-pandemic norms and are likely to persist. For instance, the share of expenditure on public transportation could remain lower than pre-pandemic levels amid the shift to flexible work arrangements. Spending on non-cooked food, in line with sales at supermarkets and hypermarkets, could also stay higher than pre-pandemic levels.

Chart 2.5 Retail sales improved, boosted by tourists spending

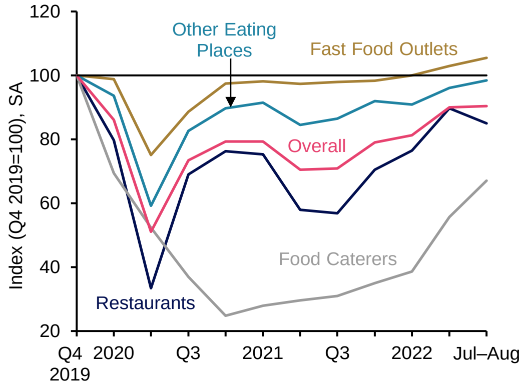
Retail sales volume



Source: DOS

Chart 2.6 Most F&B establishments continued to recover

Food & Beverage volume



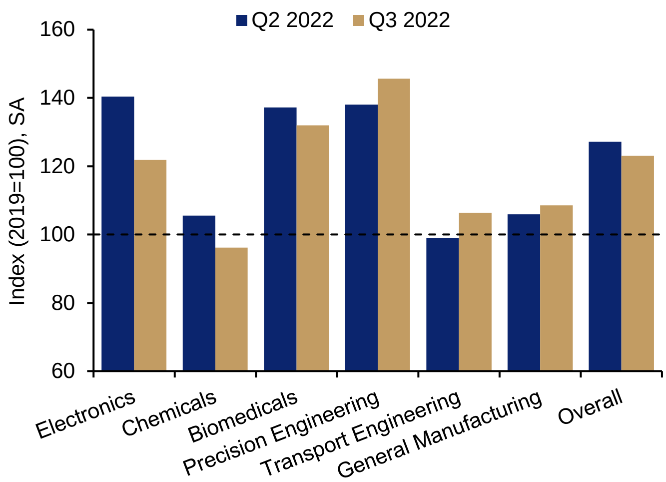
Source: DOS

Trade-related activities were generally weak

Singapore's index of industrial production grew by 3.2% q-o-q SA in Q2, driven mainly by the biomedical cluster. In comparison, the chemicals and general manufacturing clusters contracted while the electronics cluster recorded only marginal growth **(Chart 2.7)**. The manufacturing sector weakened in Q3, shrinking by 3.2%. Notably, electronics output fell by 13.3% in Q3, due mainly to the contraction in the semiconductor segment. Chipmakers have begun to see weaker end-demand for consumer devices such as smartphones and PCs in the major markets of US and China, while growth in global demand from 5G investments and data centres appeared to have peaked. The other electronic modules & components segment also turned in a lacklustre performance, with lower export orders from China and Korea.

Chart 2.7 Industrial production declined in Q3, due mainly to the electronics cluster

Index of industrial production

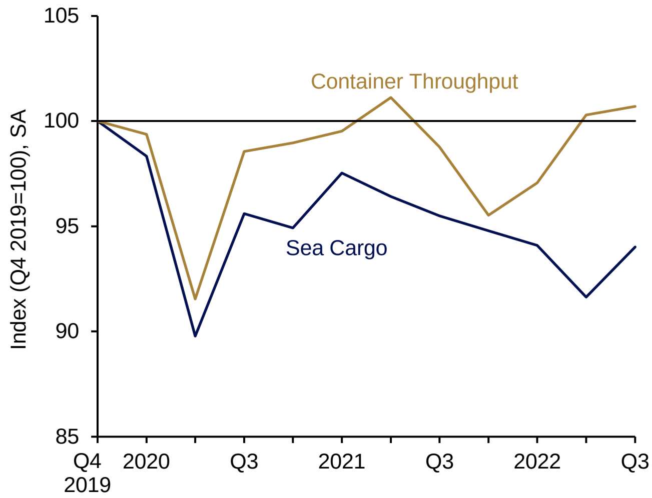


Source: EDB

Other trade-related activities, such as wholesale trade and water transportation, were hampered in Q2 by supply chain disruptions from the Russian-Ukraine conflict as well as lockdowns in China. However, there were signs of improvement in Q3, as shown by expansions in sea cargo handled (both general and bulk cargo) and container throughput **(Chart 2.8)**, suggesting some easing in previous supply chain frictions.

Chart 2.8 Both container throughput and sea cargo handled picked up in Q3

Container throughput and sea cargo



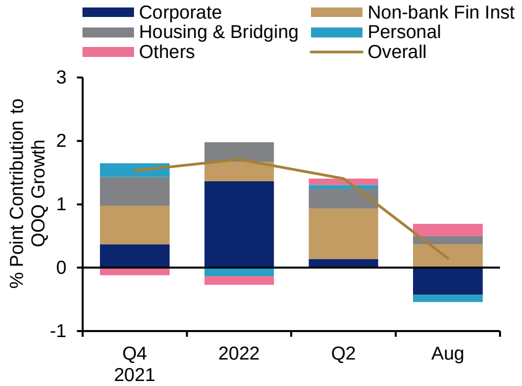
Source: MPA and Haver Analytics

Ongoing digitalisation efforts have provided some support to segments within the financial and information & communications sectors

The finance & insurance sector weakened over the last two quarters, led by poorer outturns in the banks segment. Net fees & commissions continued to fall, weighed down by lower brokerage and investment banking revenues, while credit intermediation was lacklustre in Q3. Loans to residents posted a marginal expansion of 0.1% in August relative to June, moderating from the average growth of 1.5% in the preceding three quarters. This took place amid weaker lending activity to corporates, especially in the manufacturing, building & construction and general commerce sectors **(Chart 2.9)**. Similarly, loans to non-residents fell by 2.3% over the first two months of Q3, likely chalking up a fourth consecutive quarter of contraction. The decline was broad-based across regions, of which close to 60% was accounted for by East Asia **(Chart 2.10)**.

Chart 2.9 Growth in non-bank loans to residents slowed discernibly in August...

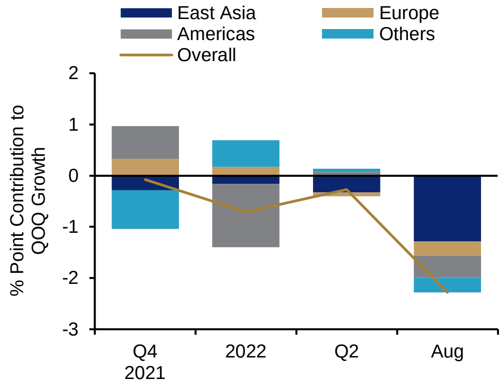
Non-bank loans to residents by loan type



Source: MAS

Chart 2.10 ... while loans to non-residents continued to contract

Non-bank loans to non-residents by region



Source: MAS

Elsewhere within financial services, the insurance segment rebounded in Q3, as life insurance net premiums picked up sequentially, buoyed by new launches of single-premium products that kept pace with rising yields. The sentiment-sensitive segments also saw an uptick as forex trading, fund management and security dealing activities generally climbed up in Jul–Aug alongside some recovery in the financial markets. Other auxiliary activities (comprising mainly payment processing players) has been resilient across both quarters, underpinned by firm consumer spending and the ongoing structural shift towards e-payment methods.

The structural trend of digitalisation has continued to benefit the information & communications sector in recent quarters. The IT & information services segment posted strong outturns, buttressed by ongoing corporate investments in data centres and 5G-related initiatives locally. Meanwhile, the telecommunications segment was lifted by the cyclical boost from mobile roaming amid increased tourism flows, while the others segment recorded higher revenues among software publishers and media production activities.

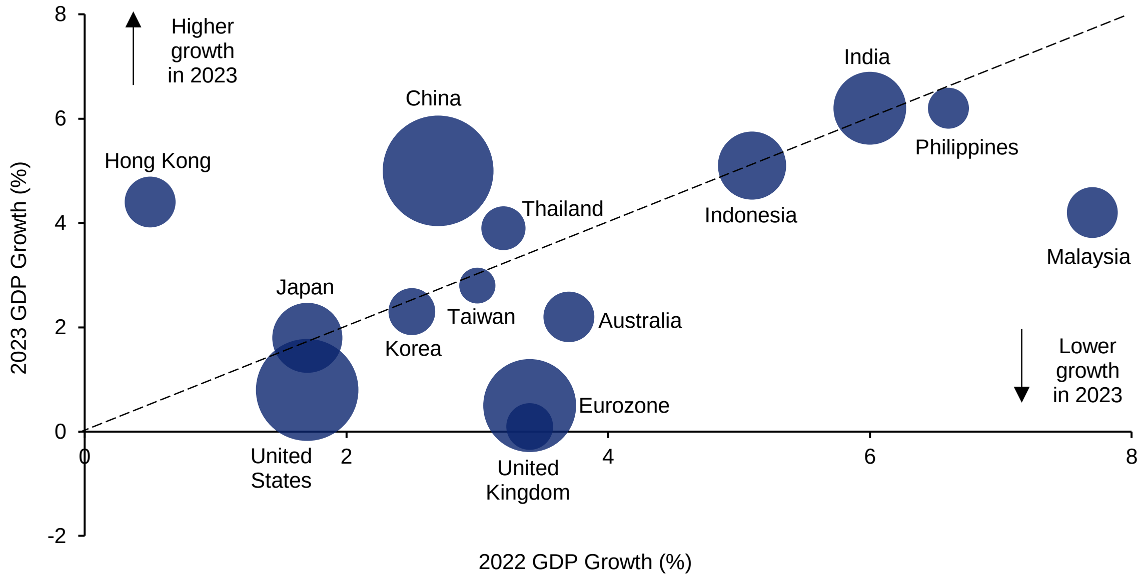
2.2 Economic Outlook

Amid external headwinds, growth in Singapore's trade-related sector is likely to remain subdued in the coming quarters

The significant tightening of global financial conditions and continued COVID restrictions in some countries are expected to weigh on growth in Singapore's major trading partners. Most of these economies are projected to record weaker growth in 2023 compared to this year, as shown by their positions below the dotted line in **Chart 2.11**. Based on the OECD TiVA data, final demand in the economies that are expected to see slower growth next year account for close to 30% of Singapore's GDP.[1] The World Trade Organisation also expects world merchandise trade volume growth to slow to 1.0% in 2023, from 3.5% in 2022. Dampened global and regional trade flows will adversely affect activity in Singapore's manufacturing, wholesale, water transport & storage sectors, even as global supply frictions continue to ease.

Chart 2.11 Most of Singapore's major trading partners are expected to post slower growth next year

Real GDP growth forecast for Singapore's major trading partners



Source: OECD TiVA and EPG, MAS estimates

Note: The larger the size of the bubble, the larger the trading partner's final demand as a share of Singapore's GDP. These shares are calculated using latest available 2018 data from OECD TiVA.

The global tech cycle is heading towards a downturn, as final demand cools

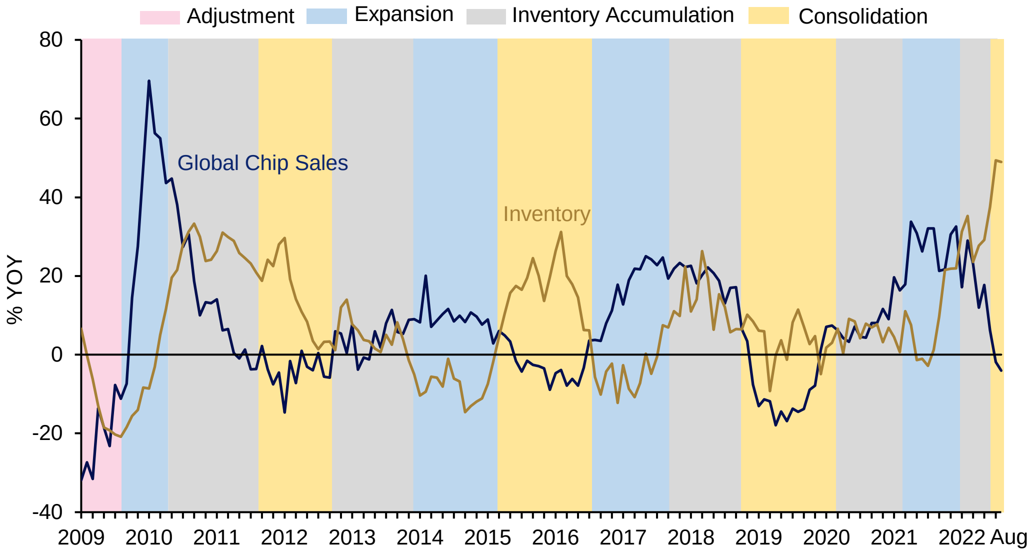
The outlook for the global electronics industry has deteriorated rapidly in recent months. The industry entered a consolidation phase in Jul–Aug as global chip sales began to contract, by 3.0% y-o-y, even as inventories continued to accumulate **(Chart 2.12)**. End-demand for electronics products has retracted in Singapore's top two final demand markets, China and the US, which together account for about a quarter of Singapore's electronics VA **(Chart 2.13)**. Notably, consumption of IT products in the US and China declined in Q2, as discretionary

[1] Singapore's own final demand accounted for 37% of its GDP.

spending was affected by elevated inflation, tighter financial conditions and consumers pivoting spending to services **(Chart 2.14)**. In addition, growth in investment demand for technology equipment in the US has slowed considerably since its peak in 2021 **(Chart 2.15)**. Going forward, a sharper decline in final demand could presage an inventory correction of end-products, which would exacerbate the fall-off in sales of intermediate semiconductor inputs, and in turn worsen the oversupply of chips.

Chart 2.12 The global electronics industry has moved into a consolidation phase

Global chip sales & inventory growth

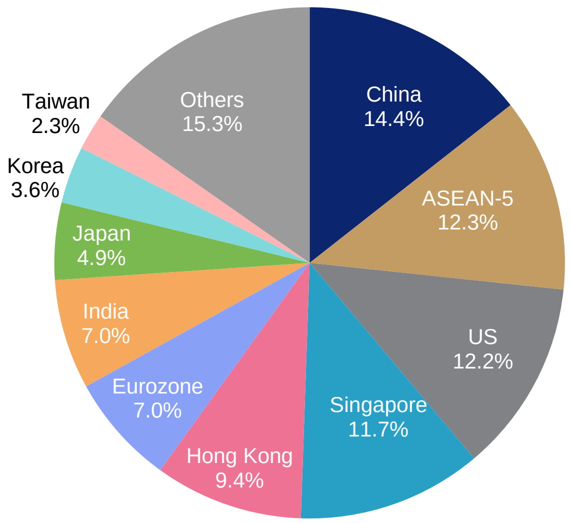


Source: WSTS and Haver Analytics

Note: The global electronics cycle comprises 4 phases: (i) expansion (+ve GCS growth, -ve chip inventory growth), (ii) inventory accumulation (+ve GCS growth, +ve chip inventory growth), (iii) consolidation (-ve GCS growth, +ve chip inventory growth), (iv) adjustment (-ve GCS growth, -ve chip inventory growth).

Chart 2.13 End-demand from China and the US accounts for a quarter of Singapore's electronics VA

Final demand markets for Singapore's electronics products

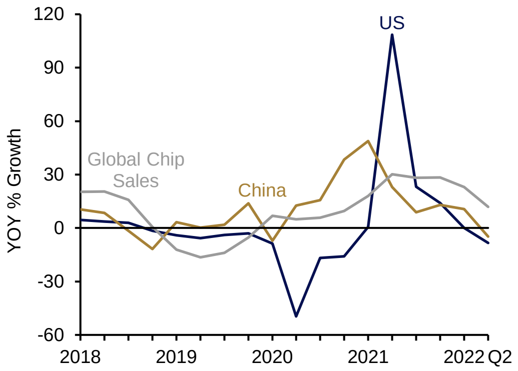


Source: OECD TiVA

Note: Figures are calculated using latest available 2018 data.

Chart 2.14 Consumer spending on IT products in the US and China shrank in Q2

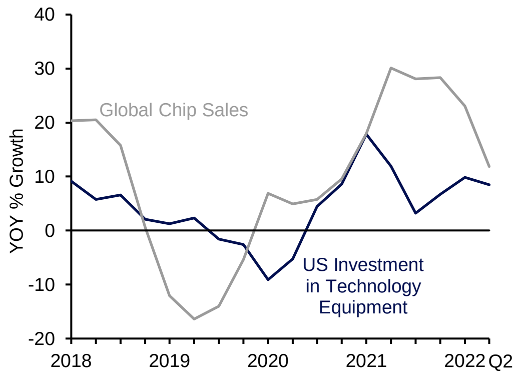
US & China consumption of IT products



Source: WSTS and Haver Analytics

Chart 2.15 Investment demand for technology equipment in the US has moderated

US investment in technology equipment



Source: WSTS and Haver Analytics

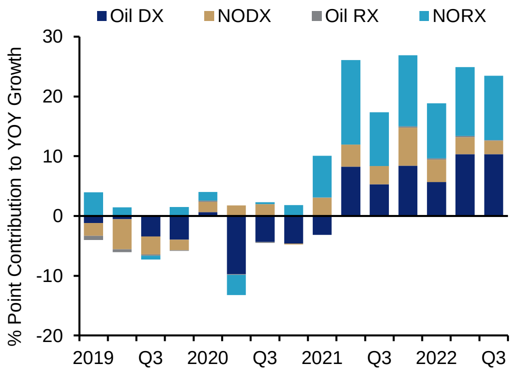
Consultancy firm Gartner has downgraded its 2022 forecast for global chip sales to 7.4% from its previous forecast of 13.6%. In 2023, the industry is expected to enter a downturn, with revenue now projected to decline by 2.5%, compared to positive growth previously. Amid slowing demand, the shortages of most chip types will fade, depressing chip prices for the rest of 2022 and 2023. The memory segment, which produces chips that store information, is anticipated to lead the decline, with major manufacturers such as Samsung Electronics and Micron issuing downbeat earnings guidance amid weakened demand for consumer and industrial electronics. In comparison, in the logic segment, which produces chips that process information, the leading foundry—Taiwan Semiconductor Manufacturing Company—expects demand for cutting-edge chips used in high-performance computing to remain firm, though the recent implementation of US export restrictions on advance chips and chip equipment to China could hamper orders and sales.

Singapore's electronics exporters have been affected by slowing demand and rising energy costs

Against this external backdrop, Singapore's trade in goods has shown signs of weakening in recent months. On a y-o-y basis, total nominal exports continued to record strong double-digit growth rates, underpinned by oil domestic exports and non-oil re-exports (NORX) **(Chart 2.16)**. However, the contribution of non-oil domestic exports (NODX) to overall export growth has moderated. In addition, overall export growth in real terms has been much lower than in nominal terms since Q2 2021, suggesting that growth in nominal export values has been boosted by higher export prices of crude oil, commodities and semiconductors, rather than increases in volume **(Chart 2.17)**.

Chart 2.16 Nominal exports continued to record robust growth...

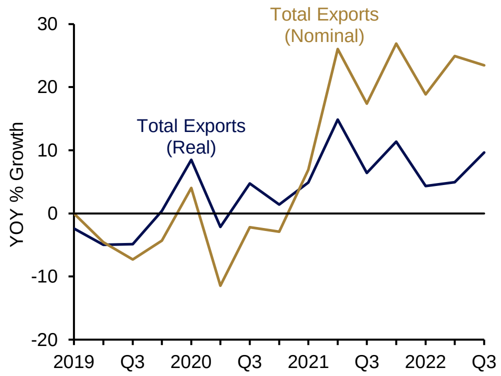
Contribution to overall exports



Source: ESG

Chart 2.17 ... but real exports growth has been substantially lower

Real and nominal exports

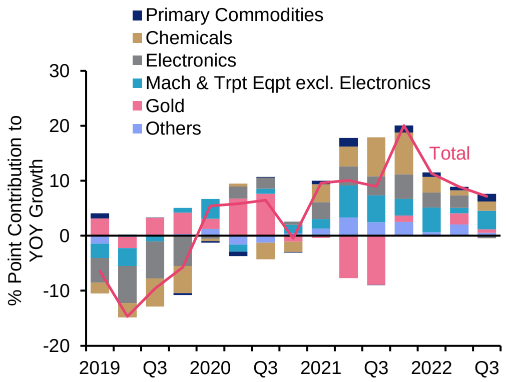


Source: ESG

In particular, with the cresting of the global tech cycle, nominal electronics exports softened discernibly in Q3, dragging down overall NODX and contributing less to NORX y-o-y growth **(Charts 2.18 and 2.19)**. On a sequential basis, both electronics DX and RX shrank in Q3 relative to Q2, largely weighed down by the decline in integrated circuits (ICs) exports. Among the major export markets, y-o-y growth in overall NODX and NORX in Q3 was driven by the Eurozone, US and regional economies such as Indonesia and Malaysia **(Charts 2.20 and 2.21)**. In comparison, demand from China and NEA-3 weakened further, with NODX to these markets contracting from a year ago.

Chart 2.18 Electronics export growth weakened in Q3, in both domestic exports....

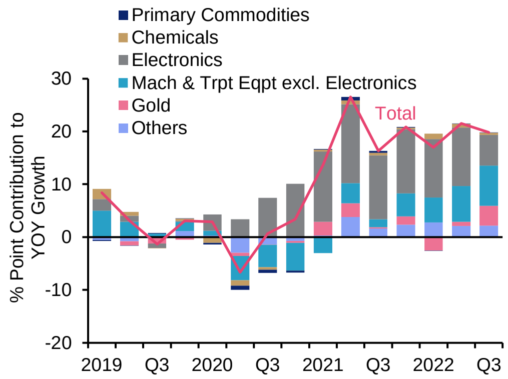
Non-oil domestic exports by product



Source: ESG

Chart 2.19 ... and re-exports

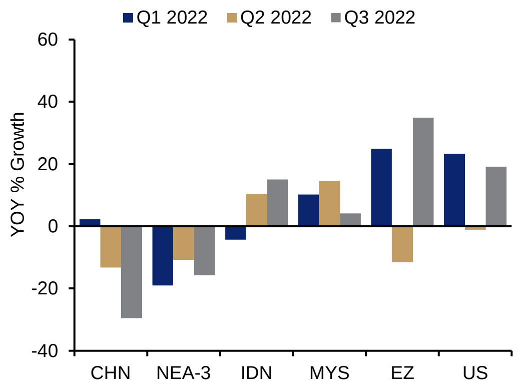
Non-oil re-exports by product



Source: ESG

Chart 2.20 NODX to China and NEA-3 recorded larger contractions in Q3...

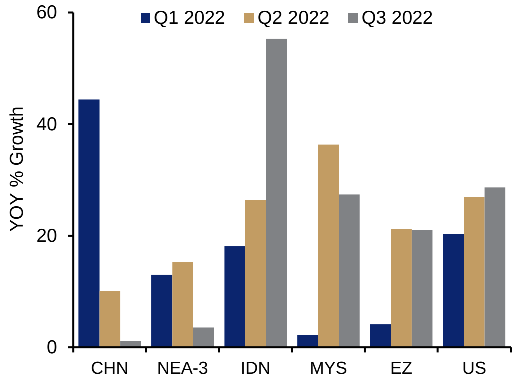
Non-oil domestic exports by market



Source: ESG

Chart 2.21 ... while NORX to these economies expanded at a slower pace

Non-oil re-exports by market



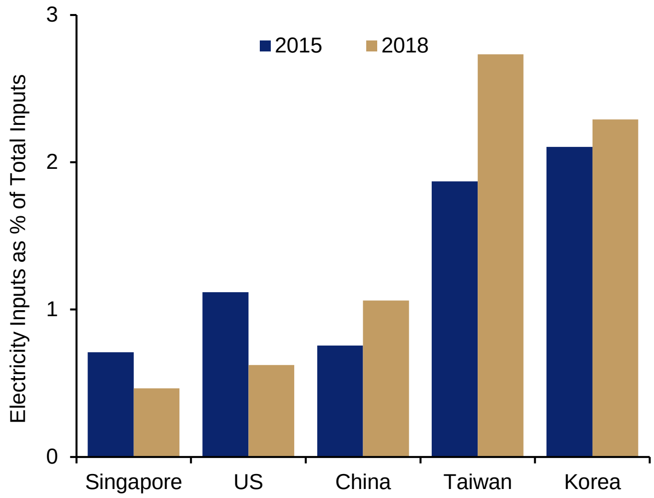
Source: ESG

The latest electronics PMI for Singapore retreated further to 49.4 in September, its second consecutive month of contraction, as new orders and exports waned. Apart from slowing demand, electronics manufacturers in Singapore are facing a rise in electricity costs as the global energy crunch continues to bite, even as the domestic electronics sector has been relatively efficient in its usage of electricity compared to that in other regional economies **(Chart 2.22)**. Although utility costs accounted for just 1.0% of total operating cost in Singapore's semiconductor industry in 2020[2], elevated energy bills could weigh on firms' margins at a time when the global chip industry is also entering a downturn.

2 Calculation is based on latest available data from EDB's Census of Manufacturing Activities 2020.

Chart 2.22 Singapore's electronics sector has been less electricity-intensive

Cross-country comparison of electricity intensity in the electronics sector



Source: OECD TiVA

Global headwinds continue to cast a pall over the financial sector

The slowing of external demand, arising from heightened global inflation and tighter financial conditions, will continue to dent growth prospects in the financial sector. In the near term, the outlook for the sentiment-sensitive segments within the sector is expected to be bearish, alongside further tightening moves by central banks globally. As of end-October, the MSCI World Index had plummeted by about 25% from its 2021 levels. The subdued performance in global equities is expected to restrain assets under management and fee income growth, and exert a drag on the fund management industry over subsequent quarters.

Similarly, within the banks segment, net fees & commissions income is likely to remain tepid. Fee income linked to brokerages, investment banking and advisory largely contracted in H1 this year, reflecting the poor sentiment in financial markets. In comparison, banks' interest income remained healthy, as net interest margins rose alongside the faster pace of policy tightening. However, lending activity has shown signs of weakening into H2. Loans to residents, which were buoyant in H1, have begun to slow in recent months as tighter financial conditions bite, while loans to non-residents have been on a downtrend since the start of the year.

Meanwhile, growth in the insurance industry could also come under pressure with the repricing of financial assets. Although sales of single-premium life insurance products posted a sequential uptick in Q3, the industry could face further headwinds in the coming quarters as it contends with higher interest rates and the proliferation of alternative cash management products on the market. In comparison, the payments processing industry has remained resilient this year and its growth momentum is likely to extend into 2023. Notwithstanding some caution in discretionary spending against the weaker global backdrop, the payments industry should remain a pillar of support over the next few quarters, underpinned by the cyclical uptick in cross-border payments as tourism flows recover, and by the ongoing structural shift towards e-payments.

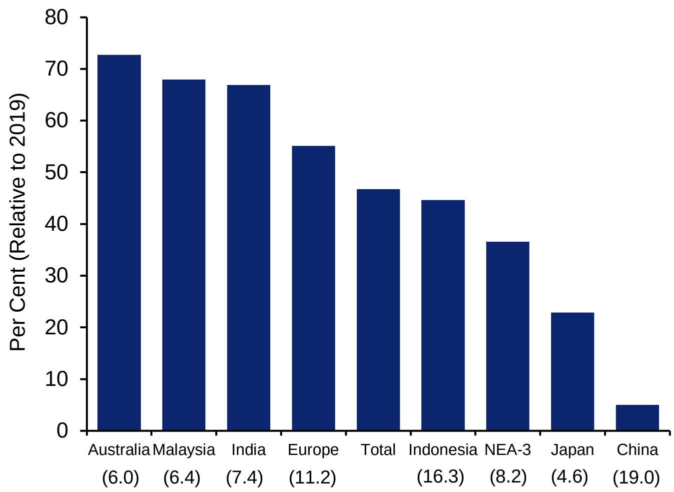
Recovery in the travel and consumer-facing sectors should continue into 2023, but its growth momentum will ease

The lifting of travel restrictions in most markets, strong pent-up demand and expanded household savings have fuelled a resurgence in travel activity since mid-2022. According to the International Air Transport Association (IATA), global air passenger numbers are expected to reach 83% of pre-pandemic levels by the end of this year. Nonetheless, the recovery could be hampered by the weakening global growth outlook, with cost considerations still a major concern. Domestically, SIA expects air passenger capacity to recover to around 80% of pre-COVID levels by end-2022, with both air passenger loads and yields[3] continuing to pick up. The upturn is likely to continue to vary across markets, depending on the extent of easing in travel restrictions. As of Q3 2022, visitor arrivals from Australia, Malaysia, India and Europe have recovered to 55–73% of pre-COVID levels, while arrivals from China and Japan languished at 5% and 23%, as travel restrictions in these locations remained tight **(Chart 2.23)**.

Beyond 2022, some moderation in inflation alongside an easing in oil prices should offer respite to consumers and the air transport industry. An earlier move away from the zero COVID policy in China could further support recovery in Singapore's tourism sector. However, structural trends could weigh on airlines' profitability. Business travel may not recover to pre-COVID levels as meetings shift online and companies commit to reducing business travel carbon emissions given sustainability concerns.

Chart 2.23 Recovery in inbound tourism varied across markets

Monthly visitor arrivals in Q3 2022 from top markets in 2019



Source: STB

Note: Data in parenthesis refers to visitor arrivals from the country as a percentage of total arrivals in 2019.

3 Passenger load factor measures the ratio of actual passengers to the available seats, i.e., the percentage of available seats that are filled by passengers. Passenger yields refer to the revenue earned for each passenger mile.

The accommodation sector is expected to stay muted this year before staging a more discernible recovery next year. The rebound in tourism demand this year is unlikely to offset the fall in government bookings, as well as staycation demand as more residents begin to travel overseas again. Furthermore, the shortage of housekeeping staff has forced hotels to lower their occupancy rates, weighing on the ability to meet the uptick in demand in the sector.

Increased visitor arrivals will, however, impart positive spillovers to the consumer-facing retail and food & beverage sectors in the near term. Some retail players have been performing better than expected this year, driven by firm local demand despite increasing resident outbound travel. The inflow of tourists have further bolstered sales since April this year. In the second half of this year, key events such as the F1 Singapore Grand Prix, Tour de France Singapore Criterium, Great Singapore Sale, and the front-loading of demand before the GST hike in January 2023 could spur spending and bring the retail sector back to pre-COVID levels.

However, growth momentum in these sectors could decelerate in 2023. First, higher inflation alongside the uncertain economic environment could dampen consumer sentiment. Second, unfulfilled pent-up consumption demand is likely to be tilted towards overseas travel rather than domestic spending, given that outbound travel by residents remains significantly below its pre-COVID level and further catch-up can be expected.

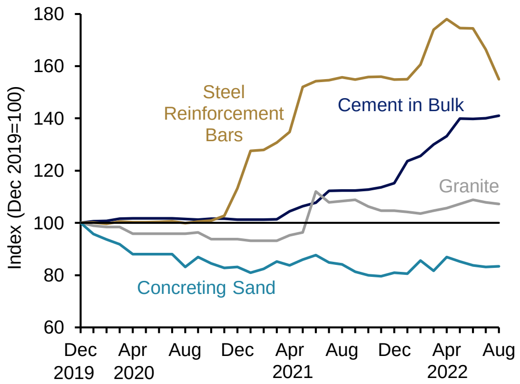
Despite the easing of labour shortages, supply-side constraints continue to weigh on the outlook for the construction sector

Construction activity is expected to pick up further in the second half of 2022 and into 2023. Labour shortages in the sector continue to ease with the lifting of border restrictions on migrant workers from South Asia since end-March 2022. However, it will take time to fully address the shortfall in skilled labour, as a period of training to raise the productivity of new workers is required. A number of workplace accidents have also led to safety time-outs and temporary work stoppages. Meanwhile, the cost of construction materials has stayed elevated given low inventory and higher energy prices that have contributed to increased production costs **(Chart 2.24)**. As of August 2022, prices of cement and steel reinforcement bars were 41% and 55% above their pre-COVID levels in December 2019. Given the still binding supply-side constraints, the construction sector could be below pre-COVID levels even at the end of this year.

Beyond 2022, activity in the construction sector remains well-supported by a strong pipeline of projects. In particular, contracts awarded in the civil engineering and residential segments have returned to pre-COVID levels since 2021 **(Chart 2.25)**. HDB's public housing projects remain on track to be progressively completed over the next few years. Other major public sector and infrastructure projects in the pipeline include the Cross Island Line, Downtown Line Extension, the Toa Payoh Integrated Development, a new integrated hospital at Bedok North and the redevelopment of Alexandra Hospital.

Chart 2.24 Cost of construction materials has remained elevated

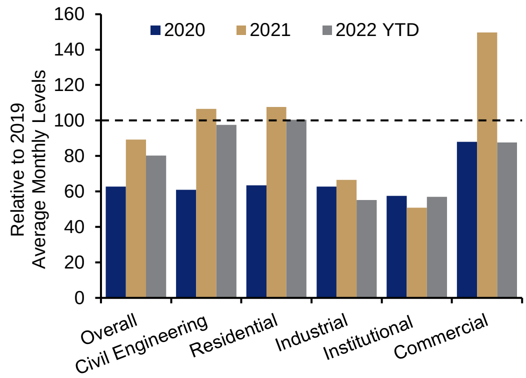
Prices of construction materials



Source: BCA

Chart 2.25 Civil engineering and residential contracts awarded hit pre-COVID levels in 2021

Contracts awarded by sector



Source: BCA

The Singapore economy is expected to slow further next year

All in, Singapore's economic growth is likely to stay restrained in the coming quarters. Full-year GDP growth is estimated to come in at 3–4% in 2022, with broad-based contributions from the trade-related, domestic-oriented, travel-related and modern services clusters. This represents a rebalancing of growth drivers from one that was predominantly led by trade in 2021. Amid weaker external demand conditions, the economy is projected to slow further to a below-trend pace in 2023, dragged down by the trade-related cluster. While growth in the economy should continue to be supported by expansions in the domestic-oriented and travel-related sectors, the pace of discretionary spending is likely to moderate as high inflation and the uncertain economic environment dampen consumer sentiment.

2.3 Singapore's Corporate Landscape: A Firm Level Analysis

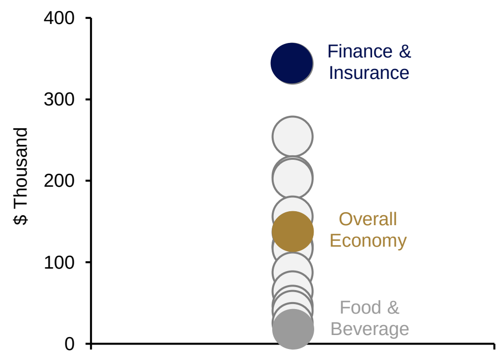
In this section, a rich firm-level database is assembled and analysed to gauge the financial and productivity performance of corporates in Singapore.

There is significant heterogeneity in productivity across and within sectors in Singapore's corporate landscape

The economy's performance at the aggregate level often masks the heterogeneity across sectors and firms. At the overall level, Singapore's labour productivity, as measured by nominal VA per worker, was around $140,000 in 2019.[4] There was however a wide disparity across sectors, with the finance & insurance sector's productivity about three times that of the overall economy, while the F&B sector trailed behind **(Chart 2.26)**. The disparity was also evident in the productivity distribution within sectors. About 80% of firms in the F&B sector had productivity lower than $40,000 compared to only around a quarter in the finance & insurance sector, with firms in the latter clustering mostly at the upper end of the distribution **(Chart 2.27)**.

Chart 2.26 There is a wide disparity in labour productivity across sectors...

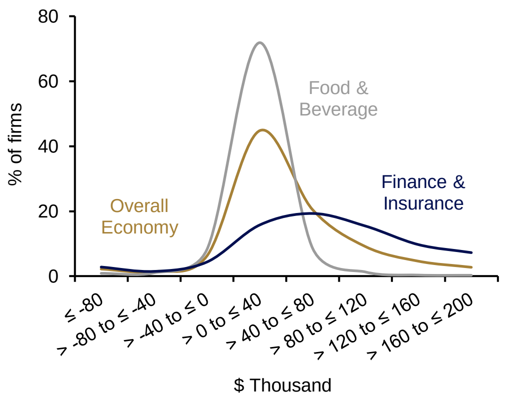
VA per worker by sector, 2019



Source: DOS

Chart 2.27 ... with financial firms leading and F&B firms trailing behind

Distribution of firms' VA per worker within sectors, 2019



Source: DOS and EPG, MAS estimates

Three archetypes of firms were identified based on the attributes of financial resilience, productivity and innovation

To gain further insights into the corporate landscape and analyse the heterogeneity across firms in the economy, EPG embarked on a joint study with DOS using firm-level administrative data. Firms[5] were broadly classified based on three attributes, namely, resilience, productivity and innovation **(Figure 2.2)**. Firms were considered financially resilient if they had healthy debt-servicing ability, adequate cash cover to meet short-term liabilities, or sufficient liquidity to cover cash burn. Meanwhile, firms were deemed productive if they had sustained high VA per worker and revenue growth in two out of the past three years.

4 Data prior to 2020 was used throughout the analysis to exclude the distortionary effects arising from COVID-19.

5 Only firms with sufficient administrative data to measure these attributes were included in the study.

Finally, firms were considered innovative if they reported R&D expenses, received innovation-related grants over the past three years, or if their tangible and intangible assets[6] made up a considerable proportion of total assets.

Figure 2.2 Firms were classified based on three broad attributes

Resilient	Productive	Innovative
Healthy debt-servicing ability	Sustained high VA per worker	Reported R&D expenses
OR	AND	OR
Adequate cash cover to meet short-term liabilities	Sustained high revenue growth	Received innovation-related grants over the past 3 years
OR		OR
Adequate cash buffer to cover cash burn		Tangible AND intangible assets make up a considerable proportion of total assets

Source: EPG, MAS

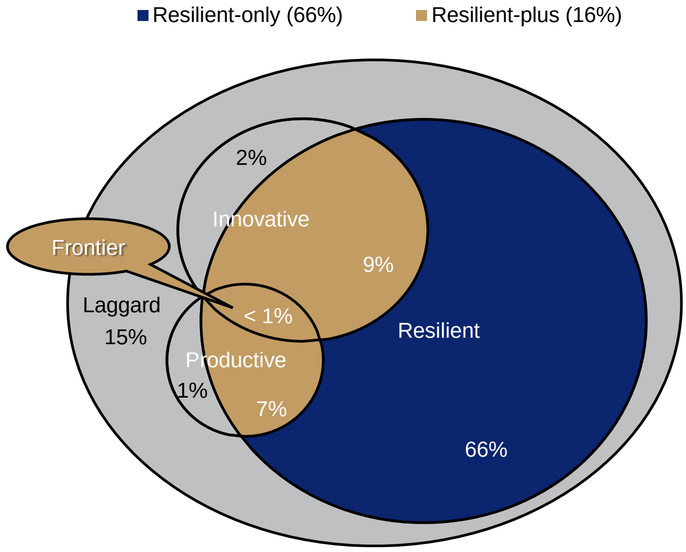
Note: A firm's debt-serving ability is based on its profit-to-liabilities ratio. Its cash cover comprises cash, bank balances and short-term investments while its cash burn represents net cash outflows taking into consideration its revenue and operating expenses.

Based on these attributes, three broad archetypes of firms were identified. Around two-thirds of firms in 2019 were resilient-only **(Figure 2.3)**. Meanwhile, 16% of firms were categorised as resilient-plus, as these firms were not only financially resilient, but also innovative or productive, or both. Less than 1% of firms were considered frontier firms possessing all three attributes. The remaining firms were characterised as non-resilient, the bulk of which were laggard firms without any of the three attributes.

[6] Tangible assets include (i) communication & network equipment; (ii) computer, office equipment, furniture fixtures & fittings; (iii) machinery & other equipment. Intangible assets include copyrights, patents, licences and franchises.

Figure 2.3 The majority of firms were resilient-only

Venn diagram of firm archetypes, 2019



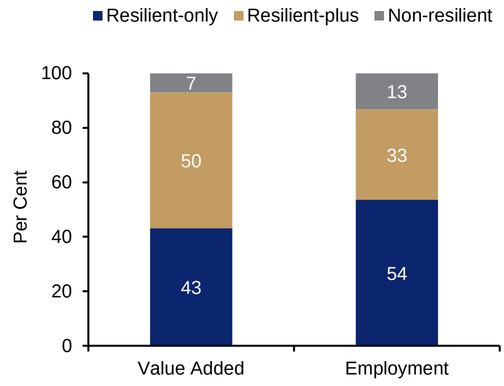
Source: DOS and EPG, MAS estimates

Resilient-plus firms accounted for a disproportionate share of VA and employment of the study cohort. While only 16% of firms were resilient-plus, they comprised half of total VA and one-third of employment **(Chart 2.28)**. Further, workers in resilient-plus firms were found to have wage and productivity premiums over resilient-only firms. On average, resilient-plus firms paid 16% higher wages than resilient-only firms, and they were almost twice as productive **(Chart 2.29)**.

Resilient-plus firms tend to employ a slightly better trained workforce. Close to half of their local workers had at least tertiary education, compared to 40% among resilient-only firms **(Table 2.1)**. Likewise, resilient-plus firms employed marginally more higher-skilled foreign workers, as shown by the share of Employment Pass Holders among total workers. Across other firm-level characteristics, resilient-plus firms were found to invest more in ICT, with 80% of the resilient-plus firms having invested in computer, communications and network equipment in 2019, higher than the 65% for resilient-only firms. Finally, resilient-plus firms had somewhat greater exposure to external markets, with close to 60% of these firms reporting overseas revenues, compared to around 50% among their resilient-only counterparts.

Chart 2.28 Resilient-plus firms accounted for a significant share of total VA and employment…

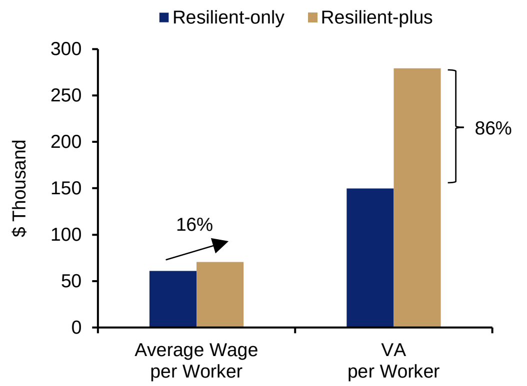
Share of VA and employment by firm archetype, 2019



Source: DOS and EPG, MAS estimates

Chart 2.29 … and had wage and productivity premiums over resilient-only firms

Wage and productivity premium by firm archetype, 2019



Source: DOS and EPG, MAS estimates

Table 2.1 Characteristics of resilient-plus and resilient-only firms

% Share of	Resilient-only	Resilient-plus
Local workers with tertiary education	40	49
Employment pass holders among total workers	7.3	8.1
Firms with ICT-related assets	65	80
Firms with export revenue	48	58

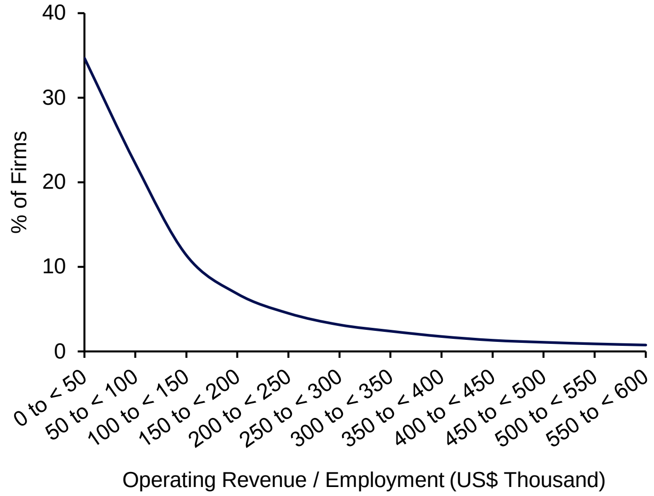
Source: DOS and EPG, MAS estimates

There is scope for the corporate sector to restructure for further productivity and wage gains

The productivity distribution of firms in the study (as proxied by revenue per worker to facilitate cross-country comparison) is positively skewed, with a large share of firms displaying lower productivity, reflecting the dominance of resilient-only firms in the economy **(Chart 2.30)**. A comparison with advanced economies showed that Singapore's distribution of firms is similar but more positively skewed than economies with strong SMEs such as Germany, and less so than the US where "superstar firm effects" tend to dominate. This potentially points to enhancements that the corporate sector in Singapore could seek.

Chart 2.30 Singapore's productivity distribution is positively skewed

Distribution of firms' labour productivity in Singapore, 2019



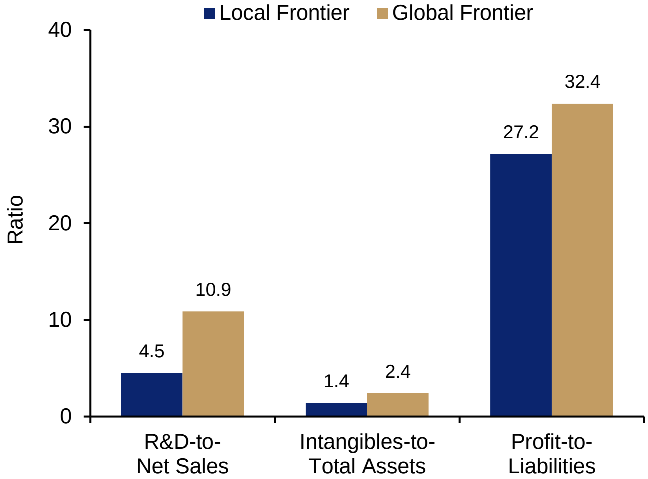
Source: DOS and EPG, MAS estimates

To position the Singapore economy for the next stage of growth, there are several ways in which the corporate sector could restructure itself. First, measures taken to raise productivity and innovation could help resilient-only firms move towards becoming resilient-plus, and lead to better wage outcomes. Simulations by EPG showed that average local wages in the economy could rise by as much as 30% if the resilient-only firms become more productive and paid wages similar to that of firms in the resilient and productive category in the same sector. The potential wage increase is broad-based across sectors, with the domestic-facing sectors such as retail and administrative & support services seeing significant increases.

Second, Singapore's frontier firms should strive to converge towards global benchmarks, which could help to uplift productivity and potential growth in the economy in the long run. Frontier firms in Singapore, which possess all three attributes of being resilient, productive and innovative, outperformed both resilient-only and resilient-plus firms in terms of the quality of their workforce, export orientation and ICT spending. However, when compared to their global peers, local frontier firms were found to spend less on R&D and have less intangible assets, which are important inputs to support innovation **(Chart 2.31)**. In terms of debt-servicing ability (as represented by profit-to-liabilities ratios), local frontier firms also lagged their global counterparts slightly.

Chart 2.31 Local frontier firms trailed behind their global peers in both innovation measures and debt-servicing ability

Innovation measures and debt-servicing ability of the median local and global frontier firm, 2019



Source: Bloomberg, DOS and EPG, MAS estimates

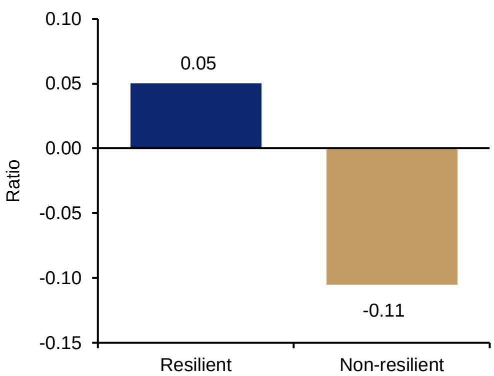
Note: Data on global frontier firms are extracted from Bloomberg, based on about 1,800 financially healthy companies with the highest R&D-to-net sales ratio in 2019. These frontier firms represent about 3% of global companies with available financial data on Bloomberg.

Risks posed by non-resilient firms warrant close monitoring

From the financial resilience perspective, there could be latent risks in the non-resilient firms. In general, these firms have weaker debt-servicing ability and lower cash cover (as indicated by the lower cash-to-current liabilities ratio), which point to a higher risk of defaulting on their borrowings **(Charts 2.32 and 2.33)**. Nevertheless, debt held by these firms was estimated to account for less than 10% of total corporate debt. Most of the debt was attributed to the transportation, storage & communications, general commerce and manufacturing sectors.

Chart 2.32 Non-resilient firms had weaker debt-servicing ability…

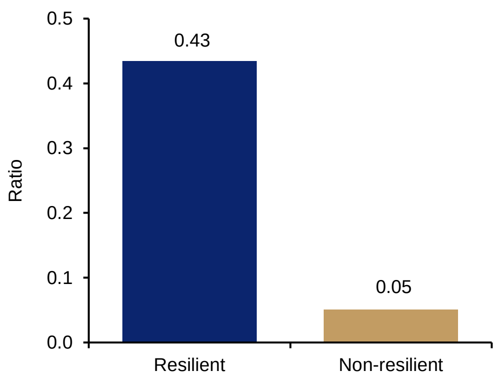
Median profit-to-liabilities, 2019



Source: DOS and EPG, MAS estimates

Chart 2.33 … and lower cash cover, relative to resilient firms

Median cash-to-current liabilities, 2019



Source: DOS and EPG, MAS estimates

In summary, Singapore's corporate landscape has been dominated by financially prudent firms which tend to lag somewhat their global peers in productivity and innovation. To progress towards the global frontier, firms in Singapore need to be more productive and innovative. Meanwhile, the limited latent vulnerability of non-resilient firms could increase amid the ongoing headwinds of rising interest rates and slower economic growth.