Economics

DBS Focus

ASEAN-6: Mapping electronics exposure

Economics/Malaysia/Thailand/Vietnam

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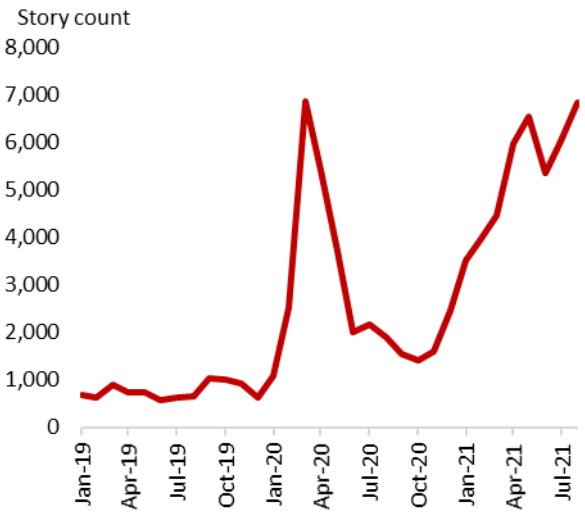
- *Global electronics supply chains are suffering from ASEAN's COVID-driven factory disruptions*
- *The stoppages are acute in Malaysia and Vietnam*
- *Exports are slowing, and dependencies on niche products are sustaining global disruptions*
- *China appears to be stepping in to fill some of ASEAN's electronics supply gap*
- *Policymakers have initiated plans to restart manufacturing activities, focusing on vaccinations*

Global supply chains are facing significant headwinds. News stories on supply chain disruptions have reached close to the highs since the turmoil caused by virus lockdowns in March – April 2020. The difficulties faced by global electronics supply chains are partly driven by ASEAN's pandemic-related factory disruptions. Manufacturing stoppages have notably been seen in Malaysia and Vietnam in recent months. **We look at the extent of the ongoing downturn, map the exposures, and discuss actions by policymakers to restart manufacturing activities.**

Stories on supply chain disruptions

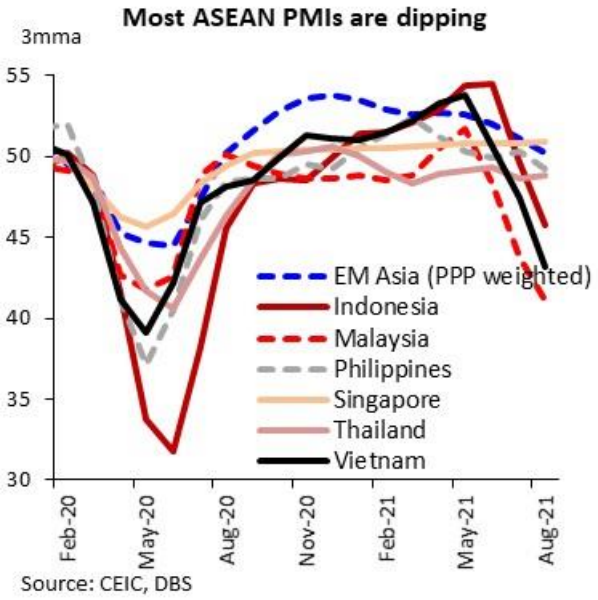


Source: Bloomberg, DBS

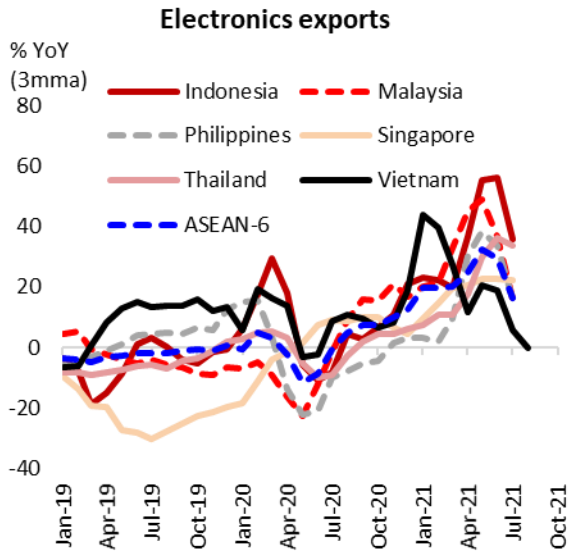
Manufacturing downturn…

ASEAN-6's manufacturing activities are broadly slowing, but at varying pace across the region. Manufacturing purchasing managers indices (PMI) for Malaysia and Vietnam have been falling deeper into contraction since June, hampered by COVID-19 related factory disruptions. In contrast, Singapore's manufacturing PMI expanded for the 14th

consecutive month in August, even though it fell modestly to 50.9 from 51 in July.



Source: CEIC, DBS



Source: CEIC, DBS

...spilling over into electronics exports

Malaysia's and Vietnam's slowing manufacturing activities from the negative supply shocks are also reflected in their rapid deceleration in electronics export growth. Vietnam's electronics shipments have slipped into contraction (on a three-month moving average basis) - the slowest pace since the pandemic disruption last year. Malaysia is also experiencing a sharp pullback. Indonesia and Philippines have slowed, but the overall economic impact is likely to be more muted. Lastly, Thailand and Singapore have been relatively resilient, compared to the region.

Heterogeneous exposures

Indonesia and Philippines are less trade-dependent, while electronics exports account for a small share in the former (even though much higher in the Philippines). In our view, inward and outward spillovers are likely to be small.

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Electronics exports, % of total exports	6.9	39.3	58.2	22.4	21.1	33.9
Trade openness (Trade, % of GDP)	33.2	116.5	58.2	320.6	97.9	209.3

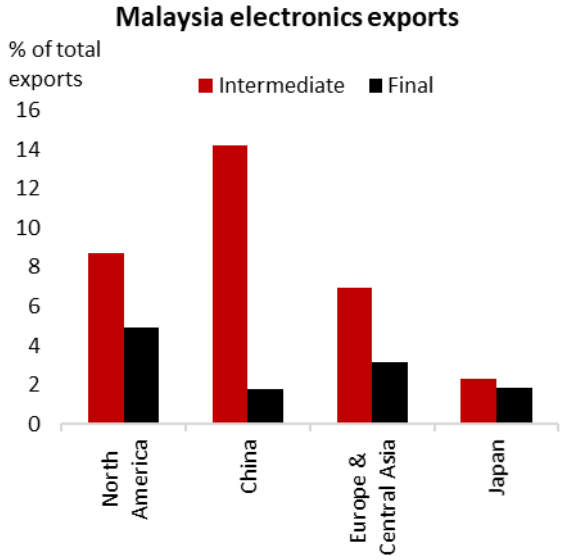
Source: CEIC, World Bank, DBS
Note: Singapore electronics exports are % of domestic non-oil exports
Black highlights refer to indicators above ASEAN-6 median

Singapore and Thailand are middle of the pack, in terms of electronic exports exposure. Singapore has the highest trade openness in the region, while Thailand is also relatively open.

Lastly, Malaysia and Vietnam are among the most open economies in ASEAN-6, and are highly integrated into the global electronics supply chain. Electronics exports therefore account for a sizeable share of their overall exports. Not only are exports taking a hit at a time when domestic demand and the services sector are already suffering from virus restrictions, the disruptions are spilling over to global production.

Mapping electronics export strength

Malaysia has long promoted an export-driven model, with dominance in electronics. Malaysia houses leading multi-national companies and growing domestic firms. The country plays an important role in micro-electronics assembly, packaging, and testing. Our analysis using UNCTAD data breakdown of electronics by SITC shows that Malaysia dominates in two key products: (1) 'automatic data processing machines' that are exported to the US, China, and Europe; (2) 'cathode valves & tubes' that are also shipped to similar places, but with a significant share to China of 17.6% relative to overall 'parts and components for electrical and electronics goods'. Malaysia largely exports intermediate electronics goods to its main trading partners, according to World Bank data. The lion shares of intermediate electronics goods head to China, at around 14% of exports.



Source: World Bank, DBS. Note: for 2020

SITC	Product	% of Malaysia's exports for each product to each country, relative to total exports for sub-segment			
		US	China	EU28	Japan
751	Office machines	0.4	0.0	0.3	0.1
752	Automatic data processing machines, n.e.s.	7.4	9.4	8.9	2.9
761	Television receivers, whether or not combined	0.4	0.4	0.8	3.0
762	Radio-broadcast receivers, whether or not combined	1.6	0.1	0.6	0.9
763	Sound recorders or reproducers	0.6	0.2	0.4	0.9
775	Household type equipment, electrical or not, n.e.s.	3.0	1.3	1.7	0.7
Total	**Electronic excluding parts and components**	**13.4**	**11.3**	**12.6**	**8.5**
759	Parts, accessories for machines of groups 751, 752	1.5	0.8	1.2	0.1
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	2.0	0.5	1.0	0.3
772	Apparatus for electrical circuits; board, panels	1.0	0.5	0.6	0.3
776	Cathode valves & tubes	6.3	17.6	5.9	3.2
Total	**Parts and components for electrical and electronic goods**	**10.8**	**19.4**	**8.7**	**4.0**

Source: UNCTAD, DBS

Note: Red refers to high exposure: above 90th percentile of each components in each major category (ie 'electronic excluding parts and components' & 'parts and components'); Green refers to low exposure: below 10th percentile; Yellow/orange are exposures in between 10th and 90th percentile

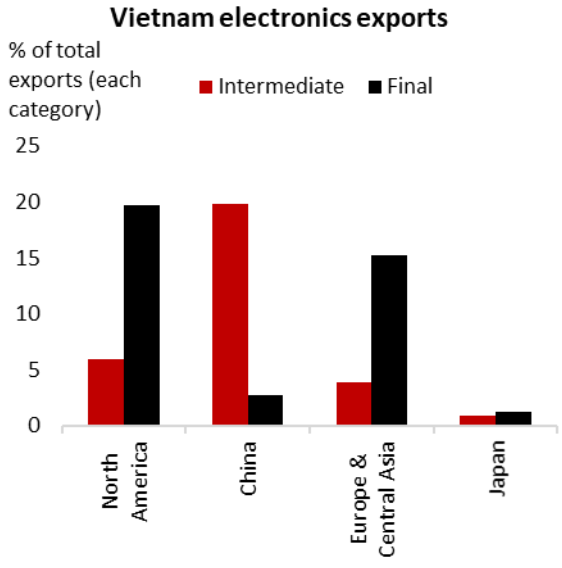
SITC	Product	% of Vietnam's exports for each product to each country, relative to total exports for sub-segment			
		US	China	EU28	Japan
751	Office machines	2.7	1.8	2.3	0.4
752	Automatic data processing machines, n.e.s.	14.4	3.8	14.3	0.8
761	Television receivers, whether or not combined	3.3	1.9	2.2	0.2
762	Radio-broadcast receivers, whether or not combined	0.3	0.0	0.2	0.0
763	Sound recorders or reproducers	0.9	5.3	0.2	0.3
775	Household type equipment, electrical or not, n.e.s.	0.6	0.1	0.5	0.6
Total	**Electronic excluding parts and components**	**22.2**	**13.0**	**19.9**	**2.3**
759	Parts, accessories for machines of groups 751, 752	0.9	8.0	1.3	0.3
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	14.0	5.6	15.8	1.2
772	Apparatus for electrical circuits; board, panels	0.8	0.4	0.3	0.5
776	Cathode valves & tubes	3.4	7.8	1.6	0.4
Total	**Parts and components for electrical and electronic goods**	**19.2**	**21.8**	**19.0**	**2.4**

Source: UNCTAD, DBS

Note: Red refers to high exposure: above 90th percentile of each components in each major category (ie 'electronic excluding parts and components' & 'parts and components'); Green refers to low exposure: below 10th percentile; Yellow/orange are exposures in between 10th and 90th percentile

Compared to Malaysia, Vietnam is a relatively newcomer to the electronics sector. Vietnam's electronic production has largely been a result of entry of tech giants, notably Samsung. Samsung started its first smartphone factory in Vietnam back in 2014, and has since invested in more production facilities. Moreover, factors such as competitive wages, wide network of free trade agreements (FTA), and proximity to China have allowed Vietnam to benefit from production relocation amid rising US-China trade tensions since 2018.

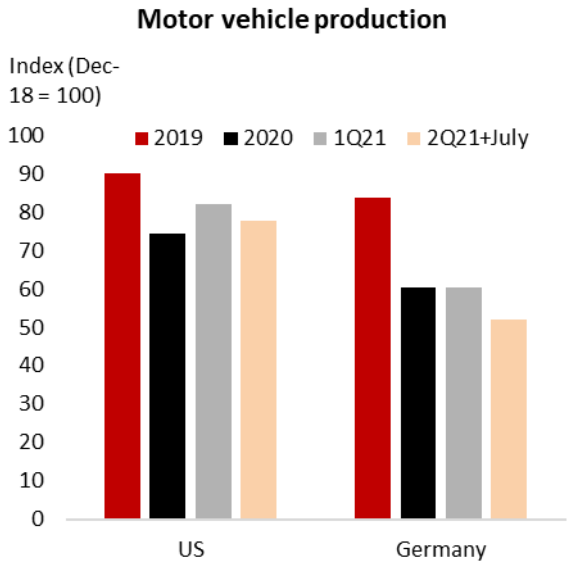
Vietnam has commanding shares in two key products: (1) 'telecommunication equipment and parts', which is a reflection of the country's important role in Samsung smartphones production; (2) 'automatic data processing machines'. These two key products are mainly exported to the US, Vietnam's largest export destination, and Europe, where the EU-Vietnam FTA has been effective since August 2020. Individual product exposure to China is relatively small, but in aggregate is comparable to the US and Europe. Vietnam mainly exports final electronics goods to North America and Europe & Central Asia regions, but instead ships intermediate products to China.



Source: World Bank, DBS. Note: for 2020

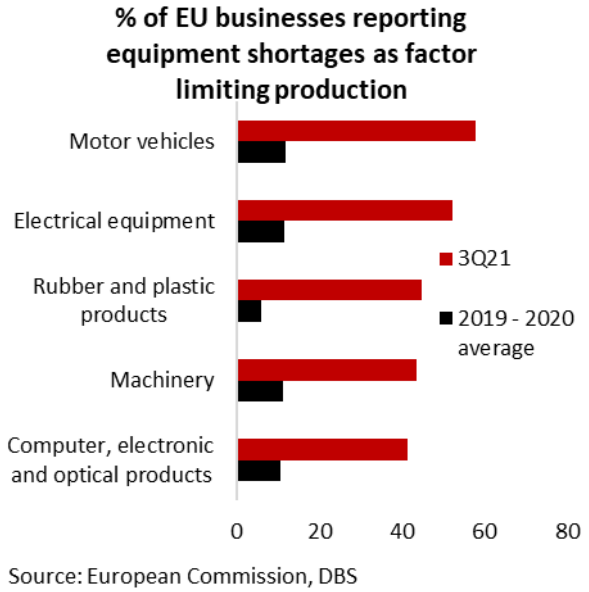
Ongoing global chip shortages

The global chip shortages are causing manufacturing production disruptions worldwide, ranging from autos to computers.



Source: CEIC, DBS

For instance, auto manufacturers in the US (e.g. Ford, GM) and Europe (e.g. Volkswagen, Daimler) continue to struggle to deal with the shortages, and these are reflected in the weakening data. Automakers fear that shortages could persist for some time (CNBC), heavily impacting their bottom-line.



Source: European Commission, DBS

A high percentage of European businesses across various industries have also reported production limitations due to shortages of material and equipment. The highest share is seen in motor vehicles, and are also elevated in electrical equipment, machinery, and computers.

Where are the import dependencies?

COVID-related factory disruptions in Malaysia and Vietnam have made the situation worse. While the US, Europe, and Japan are highly dependent on China's electronics imports, there are potential direct supply chain risks caused by ASEAN. China's supply chain is highly connected with ASEAN, which could result in indirect spillovers for advanced economies (detailed exposures shown in tables below).

US

The US imports a high share of 'automatic data processing machines', 'telecommunication equipment', and 'cathode valves & tubes' globally, compared to other electronics products. The US is strikingly dependent on Malaysia for 'cathode valves & tubes', accounting for 8.5% of total electronics parts and components imports. However, the US imports some 'cathode valves & tubes' from China and other ASEAN countries, suggesting modest room for potential trade diversion during this difficult period. 'Telecommunication equipment' from Vietnam comes in at ~7%, but China's figure is much larger at 25%, likely reflecting imports of Apple products. The US is reliant on Thailand for 'automatic data processing machines'. Thailand is a strong player in hard disk drives, counting the US, EU, and China as its major export markets.

China

China imports a sizeable amount of 'automatic data processing machines' from ASEAN, notably Thailand. 'Automatic data processing machines' imports from Thailand accounted for an overwhelming share of ~22% of total electronics (excluding parts) imports. Figures from other ASEAN countries are in low single digits. China also imports a decent amount of 'cathode valves & tubes' from both Malaysia and Vietnam. Lastly, China is dependent on Vietnam for 'parts related to office machines and automatic data processing machines. This came in at 4.5% of total electronics (excluding parts) imports, with the rest of ASEAN not even close to 1%.

Europe

Europe is especially reliant on Vietnam for 'telecommunication equipment'. The trend is similar as what is seen in the US, with a higher share from China. Europe also imports 'cathode values & tubes' from Malaysia, with the proportion slightly lower than imports from China. Europe imports 'automatic data processing machines' from Thailand and Vietnam, but the amounts are very small, when compared with China.

Japan

Japan imports small shares of 'automatic data processing machines' from Singapore and Thailand, dwarfed by China. Japan also purchases small proportions of 'telecommunication equipment' from Thailand and Vietnam, but also significantly surpassed by China.

G3's+China's electronics import dependency

SITC	Product	% of US's total imports for each product from each country, relative to total imports for sub-segment						
		China	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
751	Office machines	0.3	0.0	0.0	0.1	0.0	0.0	0.1
752	Automatic data processing machines, n.e.s.	32.8	0.2	0.8	0.6	0.2	4.1	1.6
761	Television receivers, whether or not combined	5.0	0.2	0.0	0.1	0.0	0.2	0.6
762	Radio-broadcast receivers, whether or not combined	0.3	0.0	0.2	0.0	0.0	0.3	0.1
763	Sound recorders or reproducers	2.3	0.0	0.1	0.0	0.0	0.4	0.4
775	Household type equipment, electrical or not, n.e.s.	6.8	0.2	0.3	0.1	0.0	0.6	0.0
Total	**Electronic excluding parts and components**	**47.5**	**0.6**	**1.4**	**0.8**	**0.3**	**5.6**	**2.8**
759	Parts, accessories for machines of groups 751, 752	4.4	0.1	1.3	0.6	0.3	0.3	0.8
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	25.0	0.3	1.3	0.2	0.2	1.3	6.9
772	Apparatus for electrical circuits; board, panels	2.1	0.1	0.2	0.1	0.1	0.2	0.2
776	Cathode valves & tubes	1.9	0.0	8.5	0.8	0.7	1.2	2.2
Total	**Parts and components for electrical and electronic goods**	**33.4**	**0.5**	**11.3**	**1.8**	**1.3**	**3.0**	**10.1**

Source: UNCTAD, DBS

Note: Red refers to high exposure: above 90th percentile of each components in each major category (ie 'electronic excluding parts and components' '& 'parts and components'); Green refers to low exposure: below 10th percentile; Yellow/orange are exposures in between 10th and 90th percentile

SITC	Product	% of China's total imports for each product from each country, relative to total imports for sub-segment						
		US	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
751	Office machines	0.0	0.0	0.0	0.0	0.0	0.0	0.0
752	Automatic data processing machines, n.e.s.	0.8	0.4	5.3	3.0	1.2	21.9	1.5
761	Television receivers, whether or not combined	0.1	0.0	0.0	0.1	0.0	0.0	0.4
762	Radio-broadcast receivers, whether or not combined	0.0	0.0	0.0	0.0	0.0	0.0	0.0
763	Sound recorders or reproducers	0.3	0.1	0.1	0.0	0.1	0.8	1.0
775	Household type equipment, electrical or not, n.e.s.	0.3	0.1	1.2	0.0	0.1	0.1	0.2
Total	**Electronic excluding parts and components**	**1.5**	**0.6**	**6.6**	**3.1**	**1.3**	**22.9**	**3.1**
759	Parts, accessories for machines of groups 751, 752	0.1	0.0	0.2	0.4	0.1	0.4	4.5
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	0.1	0.0	0.1	0.0	0.0	0.0	0.5
772	Apparatus for electrical circuits; board, panels	0.4	0.0	0.1	0.1	0.1	0.2	0.2
776	Cathode valves & tubes	3.0	0.0	6.7	1.6	1.4	1.1	4.0
Total	**Parts and components for electrical and electronic goods**	**3.5**	**0.1**	**7.2**	**2.1**	**1.6**	**1.7**	**9.2**

Source: UNCTAD, DBS

Note: Red refers to high exposure: above 90th percentile of each components in each major category (ie 'electronic excluding parts and components' '& 'parts and components'); Green refers to low exposure: below 10th percentile; Yellow/orange are exposures in between 10th and 90th percentile

SITC	Product	% of Europe's total imports for each product from each country, relative to total imports for sub-segment						
		China	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
751	Office machines	0.3	0.0	0.0	0.0	0.0	0.0	0.1
752	Automatic data processing machines, n.e.s.	23.2	0.1	0.5	0.5	0.3	1.4	1.1
761	Television receivers, whether or not combined	4.0	0.0	0.1	0.1	0.0	0.0	0.3
762	Radio-broadcast receivers, whether or not combined	0.3	0.0	0.0	0.0	0.0	0.0	0.0
763	Sound recorders or reproducers	1.7	0.0	0.0	0.0	0.0	0.1	0.1
775	Household type equipment, electrical or not, n.e.s.	5.6	0.1	0.2	0.1	0.0	0.1	0.0
Total	**Electronic excluding parts and components**	**35.0**	**0.3**	**0.9**	**0.7**	**0.3**	**1.6**	**1.6**
759	Parts, accessories for machines of groups 751, 752	5.3	0.0	0.5	0.1	0.1	0.1	0.9
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	15.4	0.0	0.7	0.0	0.1	0.4	4.1
772	Apparatus for electrical circuits; board, panels	2.5	0.1	0.1	0.1	0.1	0.2	0.1
776	Cathode valves & tubes	3.8	0.0	2.5	0.6	0.6	0.5	0.6
Total	**Parts and components for electrical and electronic goods**	**27.0**	**0.2**	**3.9**	**0.9**	**0.9**	**1.2**	**5.7**

Source: UNCTAD, DBS

Note: Red refers to high exposure: above 90th percentile of each components in each major category (ie 'electronic excluding parts and components' '& 'parts and components'); Green refers to low exposure: below 10th percentile; Yellow/orange are exposures in between 10th and 90th percentile

SITC	Product	% of Japan's total imports for each product from each country, relative to total imports for sub-segment						
		China	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
751	Office machines	0.8	0.0	0.1	0.0	0.0	0.1	0.0
752	Automatic data processing machines, n.e.s.	48.4	0.4	0.6	0.7	1.6	2.5	0.5
761	Television receivers, whether or not combined	8.4	0.0	1.2	0.4	0.0	0.5	0.1
762	Radio-broadcast receivers, whether or not combined	0.6	0.0	0.3	0.0	0.0	0.2	0.0
763	Sound recorders or reproducers	4.7	0.1	0.4	0.2	0.0	0.7	0.3
775	Household type equipment, electrical or not, n.e.s.	10.7	0.2	0.6	0.1	0.0	2.1	0.3
Total	**Electronic excluding parts and components**	**73.6**	**0.8**	**3.3**	**1.5**	**1.6**	**6.2**	**1.2**
759	Parts, accessories for machines of groups 751, 752	7.8	0.2	0.3	0.4	0.1	0.9	0.7
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	28.0	0.1	1.5	0.6	0.1	2.4	3.0
772	Apparatus for electrical circuits; board, panels	4.2	0.2	0.3	0.4	0.1	0.8	0.6
776	Cathode valves & tubes	7.1	0.1	1.7	0.9	1.1	1.1	0.3
Total	**Parts and components for electrical and electronic goods**	**47.2**	**0.7**	**3.8**	**2.3**	**1.4**	**5.3**	**4.5**

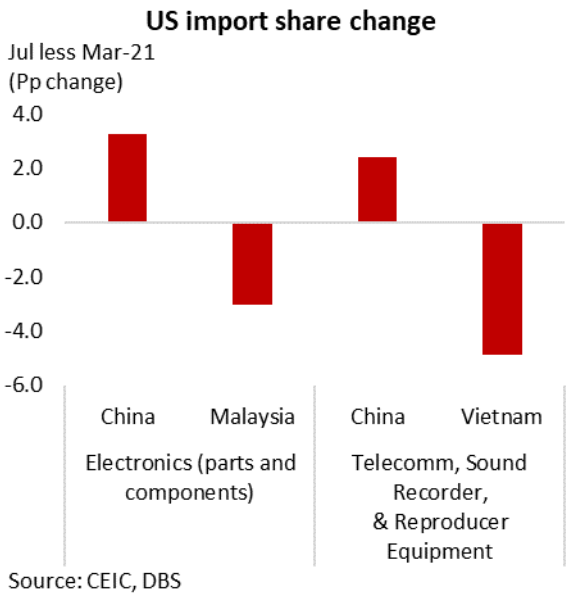
Source: UNCTAD, DBS

Note: Red refers to high exposure: above 90th percentile of each components in each major category (ie 'electronic excluding parts and components' '& 'parts and components'); Green refers to low exposure: below 10th percentile; Yellow/orange are exposures in between 10th and 90th percentile

Temporary trade diversification to China

Firms' China+1 diversification strategy appears to have bear some fruits. Chinese companies seem to have stepped in to fill some of Malaysia's and Vietnam's supply gap.

Our analysis of US trade numbers showed that US's import share of electronics parts and components from China rose during the period from March 2021 to July 2021, mirroring the decline in the import share from Malaysia.



Source: CEIC, DBS

US's imports of 'telecommunications, sound recorder & reproducer equipment' from China rose during the same period, but was half of the decline seen for Vietnam, suggesting that the gap was not fully covered. Should COVID-19 disruptions be prolonged, this could delay production relocation to Vietnam from China, and even see China regain market share. For instance, there are indications that Apple will be producing AirPods earphones in China instead of Vietnam, while Google will built its Pixel 6 smartphones in China rather than Vietnam (Nikkei Asia).

ASEAN's strategy

Policymakers in Malaysia and Thailand are rolling out plans to ease factory COVID-related disruptions, and restart production. Vaccination is a key part of their strategies, which would enable safe manufacturing operations. Vietnam is however lagging behind in vaccinations, and has imposed tough anti-virus policies.

Malaysia

Malaysia has launched the COVID-19 Public-Private Partnership (PIKAS) Industrial Immunisation Programme since July, focusing on vaccinating factory workers. This programme complements the National COVID-19 Immunisation Programme, with all adults in Malaysia expected to be fully vaccinated by October. 98% of the 900k registered workers under PIKAS have received at least one dose of vaccine, as of early-September (New Straits

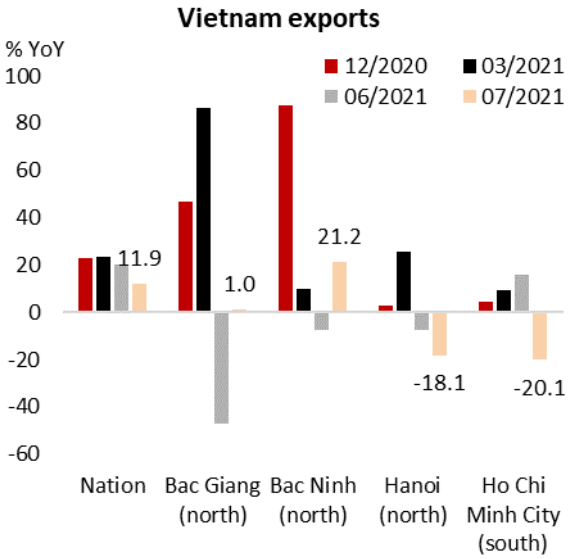
Times). PIKAS is expected to be completed by September. Since August, essential and non-essential manufacturing operations are allowed, with capacity determined by workers' vaccination rates. Companies, which have 40%-59% of workers fully vaccinated would be allowed to operate at 60% capacity; 60%-79% of workers (80% capacity); and 80%-100% of workers (100% capacity). **In our view, high vaccination rates should allow factories to restore their capacity over the coming months, and capture still-robust demand for electronics products, going into 2022.** Bank Negara Malaysia (BNM) is positive about the outlook for electronics exports and production. It said in its 2Q GDP release that several firms have reported full order books until year-end (BNM 2Q GDP release box article).

Thailand

Thailand has seen some virus-related factory disruptions in July, but this has since eased. Thailand's manufacturing PMI is contracting as of August, but has not experienced large magnitudes like in Malaysia and Vietnam. With the aim of preventing COVID-related stoppages to its manufacturing sector, the country has launched the 'Factory Sandbox' in August. The programme is a pilot to test, vaccinate, isolate factory workers (Bangkok Post). The pilot will focus on large factories (those with 500 or more workers), starting with 60 factories in four provinces (Nonthaburi, Pathum Thani, Samut Sakhon and Chonburi) that are within an hour's drive from Bangkok.

Vietnam

Vietnam's manufacturing supply shock could be more long-lasting due to still-low vaccination rates across the population, due to vaccine supply issues. To stem further virus-related disruptions, factories are ordered to provide on-site sleeping accommodations for workers and transportation to shuttle staff to plants. Factories are asked to shut if they cannot adhere to the policies. For electronics, especially Samsung's production, the mitigating factor is that majority of Samsung's suppliers is in northern Vietnam. Northern Vietnam is faring better with regards to the pandemic, compared to Southern Vietnam. Bac Ninh, where most of Samsung's reported suppliers are based, has seen an improvement in exports as of July (based on latest available data breakdown by provinces).



Source: CEIC, DBS

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