

Technology

Semiconductor Landscape Post-US Election

By **Samuel Tan** | samueltan@kenanga.com.my

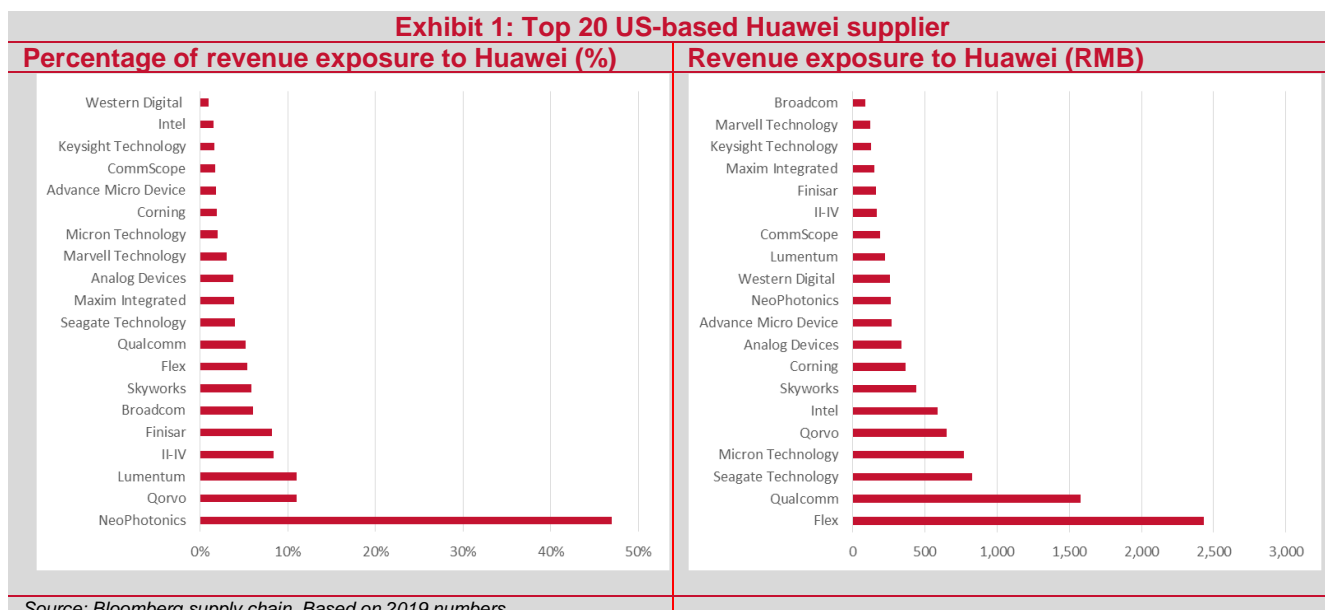
We believe the new US administration's approach to policy setting will likely be more sensible compared with the previous administration, leading to a more accommodative landscape for the semiconductor sector. The Trump administration has not just disrupted China's supply chain but also hurt US firms in turn as the current policy discourages companies from setting up new facilities. In fact, US firms are looking to relocate offshore to circumvent the export control restriction. Moreover, foreign companies may think twice before purchasing US-designed semiconductor manufacturing equipment, concerned that the delivery of US equipment may be unreliable. Therefore, with Biden taking over the new US administration, we expect to see easing of such unreasonable bans and erratic policy-making which would restore the semiconductor industry to its glory days.

China is seen to be firing on all cylinders as the Chinese government set up the "Big Fund Phase-2" with an investment sum of RMB204b (US\$29.8b) to achieve technology self-sufficiency. SMIC has been revising its capex budget aggressively higher to US\$5.9b, 3x higher than that of FY19 at US\$1.9b. SMIC recently reported a 123% YoY jump in profit on record high revenue for 3QCY20. Its current utilisation rate is at 100% and it is guiding momentum to remain strong going into 1H 2021. DigiTimes reported that 8-inch wafer foundries in general are experiencing orders at 20% beyond their supply capacity. The imminent shortage will likely continue into 2021 and urgent orders will see a 10% increase in pricing

Local beneficiaries include the likes of **KGB (Outperform; TP: RM1.92)** who is securing more jobs from SMIC. We believe back-end packaging and testing segment will grow along China's front-end expansion, benefiting **MPI (Outperform; TP: RM18.80)** and **UNISEM (Outperform; TP: RM5.15)** who has plants in Suzhou and Chengdu respectively. In addition, OSAT equipment makers such as **Mi Technovation** (unrated) is poised to benefit from rising orders. Eyeing the positive trend, **INARI (Outperform; TP: RM3.14)** has recently formed a JV with Singapore-based MIT Semiconductor to develop OSAT equipment.

Biden’s victory — a boon for semiconductor industry

With Joe Biden as the new US president, we believe his approach to policy setting will likely be more sensible as compared with the previous administration. The Trump administration’s relentless attempts to suffocate China’s semiconductor advancement has not just disrupted China’s supply chain, but has also stifled US semiconductor companies as a result. This is mainly due to the fact that China plays a crucial role on the demand side of things, consuming more than half of global semiconductor shipment. Narrowing it down to the Huawei as a single entity, we could see that its top 5 US-based supplier have revenue exposure of circa 8-11% while NeoPhotonics has an exceptionally high exposure of 47%. The adverse impact to US firms would be further amplified if such irrational bans were to extend to the semiconductor manufacturing firms in China such as SMIC (China’s largest wafer foundry and ranked 3rd globally in terms of capacity).



The below points illustrates why America’s current policy is hurting themselves:

- i. Wafer foundries in foreign countries such as TSMC in Taiwan, SMIC in China and Samsung in Korea may consider avoiding purchasing American-designed semiconductor manufacturing equipment, as they may potentially face disruption in the future. As such, alternative suppliers for competing equipment from the Japanese (Tokyo Electron) or Dutch (ASML) companies are starting to look more attractive.
- ii. The current ban on Huawei could do more harm to the US than what the previous administration may have realised. Aside from slowing Huawei’s progress in the 5G space and taking over the smartphone market share, it could further lead to financial issues. If Huawei fails financially, or even cease to have any future relationship with American companies, Huawei may halt payment of billions of dollars in license fees it owes to American firms for use of earlier technologies. For example, Huawei license ARM’s architecture (which Nvidia is in the midst of acquiring) and Cadence’s electronic design automation (EDA) software for almost all of its smartphones and 5G base station processor.

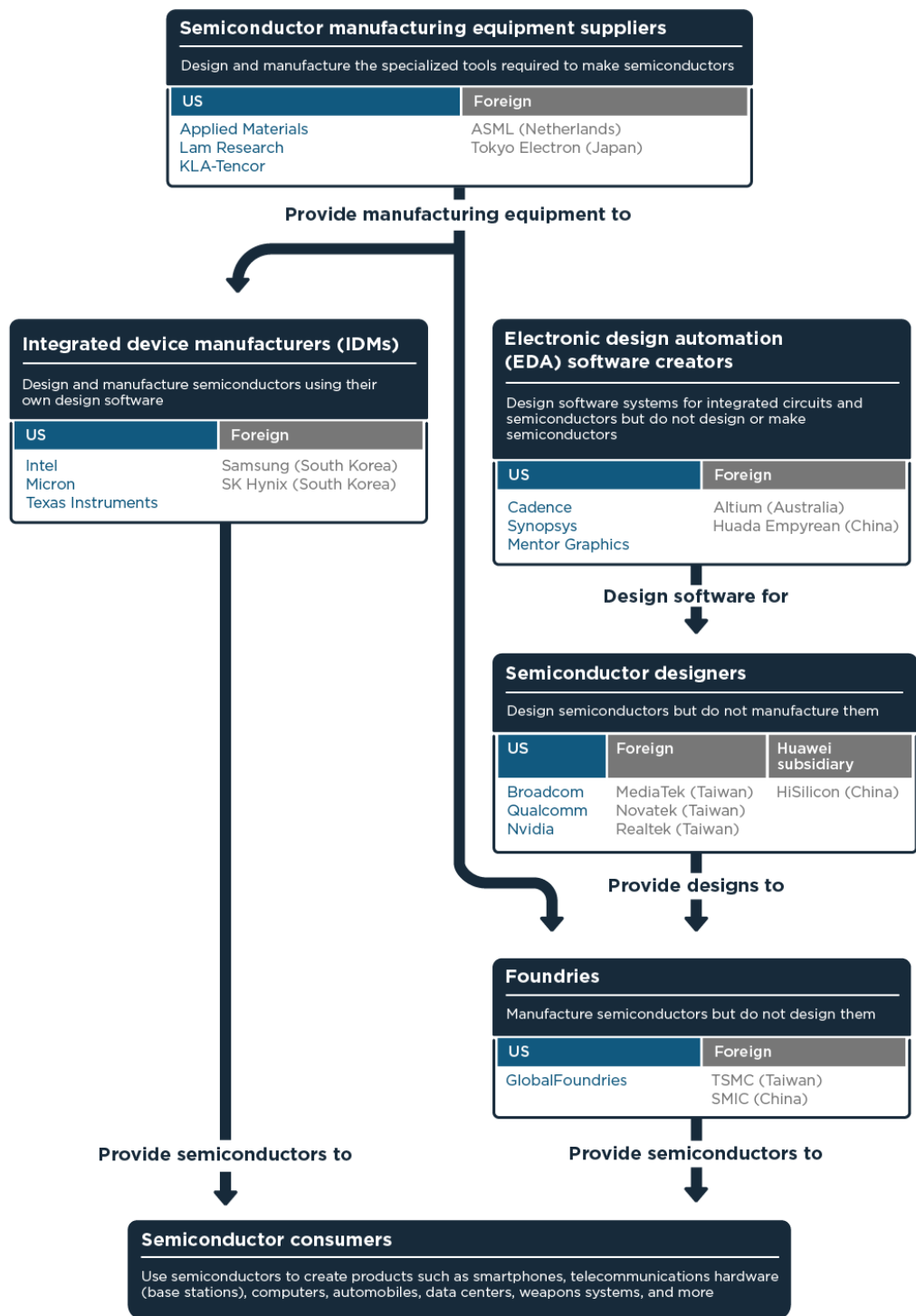
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- iii. The restriction on doing business with China will continue to discourage companies from setting up new facilities (such as semiconductor, software and tool fabrication) in the United States. From what we gather, even firms which are currently having manufacturing plant in the US itself are exploring the possibility of relocating production activities offshore in order to circumvent the US export control.
- iv. If such disruptive policies continue, the concern of supply interruption would cause major foreign consumers of US-made semiconductors to look elsewhere in the future, even if their products do not pose any national security risk. This includes other Chinese smartphone suppliers like Vivo, Oppo, and Xiaomi which are not in the entity list and are still able to purchase US-made semiconductor. Based on the latest 3QCY20 statistics by IDC, Vivo, Oppo and Xioami collectively make up 31% of global smartphone shipment.
- v. Retaliation by China may be inevitable as Beijing would not sit idly as US continue to target Huawei. Note that China's Ministry of Commerce (MOFCOM) had on 19 September announced that it will implement its own "unreliable entity list" of foreign firms that may be cut off from China's consumer market. Under China's new regime, a foreign entity included in the unreliable entity list will be restricted or prohibited from China-related trade which could cripple their business in the region. Thus far, no companies have been listed, but there is already speculation that, at some point, Beijing could add American companies like Apple, Cisco, and Qualcomm to the list, resulting in new costs for American companies.
- vi. Current export controls set by the Trump administration would create concerns over discrimination, non-transparency and cronyism. The prior policies on export controls were narrowly targeted, resulting in little need for a process to consider exceptions. In comparison, the Trump administration has gone ahead with a regime that is overly expansive by design, with the possibility that government officials could decide on exceptions arising from company's petitions. Due to the case-by-case approach, some petitions may be accepted, while others may be denied. As such, the secrecy demanded by "national security" raises the perception that decisions made by the US government could be biased, swayed by favouritism instead of objectively assessed risk.

This could generate conflict with allied governments such as Taiwan and South Korea as firms in these countries are tightly involved in the semiconductor supply chain and will be negatively impacted by biased decisions from the US government (e.g. forcing TSMC to reduce exposure to Huawei by threatening supply continuity of US-manufactured equipment). Going to the extent of restricting what foreign companies can do in their home countries placed a serious threat to allied governments' national sovereignty as it sets a dangerous precedent of unilateralism.

Recognising the detrimental risk to such policies, SEMI (a semiconductor association with 2,400 members worldwide, including companies such as Lam Research, Applied Materials, Intel, KLA-Tencor and SMIC), drafted a letter to the US Commerce Department to lobby against such bans and the idea of adding SMIC into the entity list. SEMI highlighted that furthering such move would contribute to a growing perception that the delivery of US equipment is unreliable. Therefore, with Biden taking over as the new US administration, we expect to see easing of such unreasonable bans and erratic policy making which will re-establish the semiconductor industry to its glory days.

Exhibit 2: Supply chain overview of front-end semiconductor manufacturing



Source: PIIIE

Made in China 2025 — full speed ahead to achieve self-sufficiency

China's semiconductor supply chain has been undergoing increasing pressure as the US administration conducts its relentless pursuit to rattle China's chip manufacturing capabilities, whether through limiting the sale of wafer fabrication equipment or restricting the use of crucial software and intellectual property rights for chip designing. While this has caused disruption to China's semiconductor supply chain, it has at the same time helped China to better understand its limitations and motivated the country to accelerate the process of achieving self-sufficiency.

China is seen to be firing on all cylinders as the Chinese government (together with 26 other stakeholders) had on 22 Oct 2019 set up the "Big Fund Phase-2" with an investment sum of RMB204b (US\$29.8b) to further decouple itself from the US and become technologically self-sufficient. The focus of "Big Fund Phase-2" investment will likely aim towards alleviating bottlenecks in key areas such as critical semiconductor equipment and materials, EDA software, as well as downstream application of Artificial Intelligence and 5G.

To recap, the "Big Fund Phase-1" initiative managed to raise RMB138.72b (US\$20.3b) back in 2014 and became the largest single industrial investment fund in China. From 2014 to 2017, the total capex of China's chip manufacturing sector doubled compared to the previous four years, thanks to investments in 77 new projects spread across 55 companies locally. We gather that bulk of the funds (c.67%) were allocated towards semiconductor manufacturing, along with design (c.17%), packaging & testing (c. 11%) and semiconductor equipment & material (c. 6%).

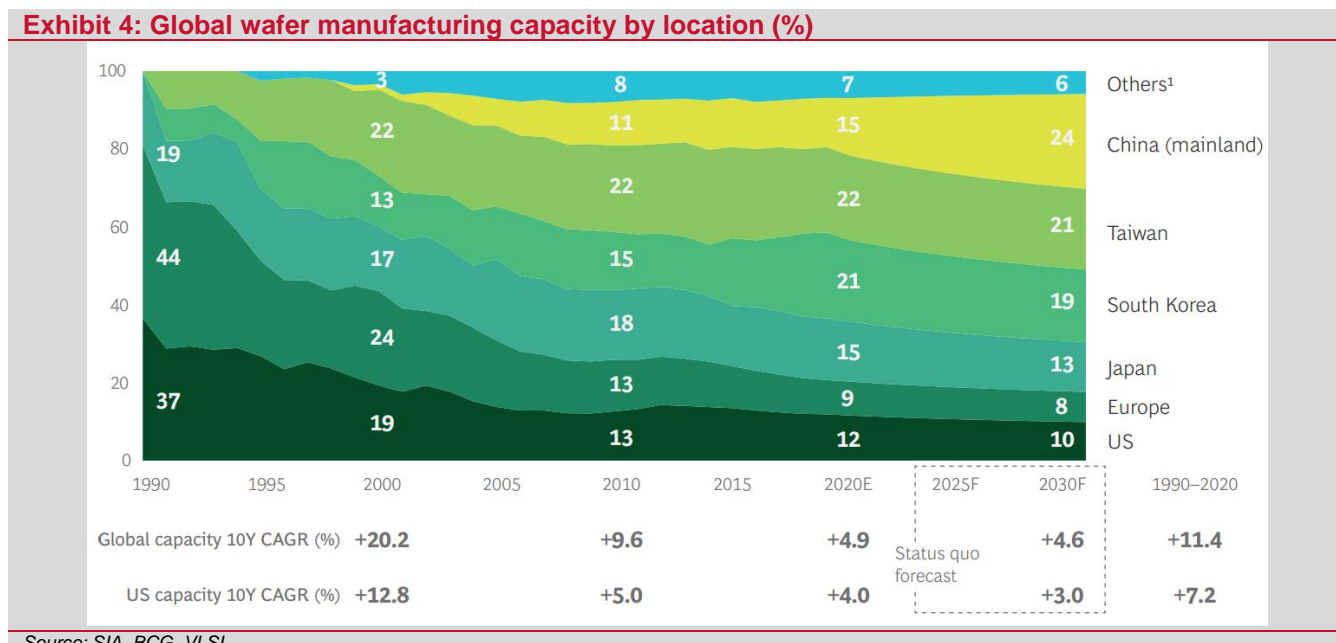
Exhibit 3: Global wafer manufacturing capacity by location (%)

By 2015	By 2020	By 2030
<p>Integrated-circuit (IC) industry overall revenue (design, manufacturing, packaging, and testing) exceeds 350 billion yuan (about \$55 billion)</p> <p>Volume production of 32- and 28-nm¹ chips</p> <p>Wireless and telecom IC design capabilities approach world-class level</p> <p>>30% of total packaging and testing revenues come from middle- to high-end products</p> <p>45- to 65-nm semiconductor equipment in production; 12-inch silicon wafers and other key materials in production</p>	<p>Compound annual growth rate of revenues \geq20%</p> <p>Volume production of 16/14-nm chips</p> <p>World-class IC design in applications such as wireless, telecommunications, cloud computing, Internet of Things, and big data</p> <p>World-class packaging and testing technology</p> <p>Integration of key equipment and consumables from China into the global supply chain</p> <p>Development of an advanced, safe, and secure IC industry value chain</p>	<p>World-class IC industry value chain</p> <p>A set of leading companies considered tier 1 players in the global semiconductor market</p>

Source: Guideline of the National IC Industry Development Promotion

In tandem with the “Made in China 2025” campaign, the Chinese government plans to cover 70% of its local chip demand by 2025, a steep increase from its current capability of producing 20% of the chips it needs for the local tech industry. According to SIA and BCG, China’s wafer production as of 2019 stands at 15% (Exhibit 4) of global capacity and is expected to continue increasing northwards of 24% in the next decade, taking over market share from all other countries.

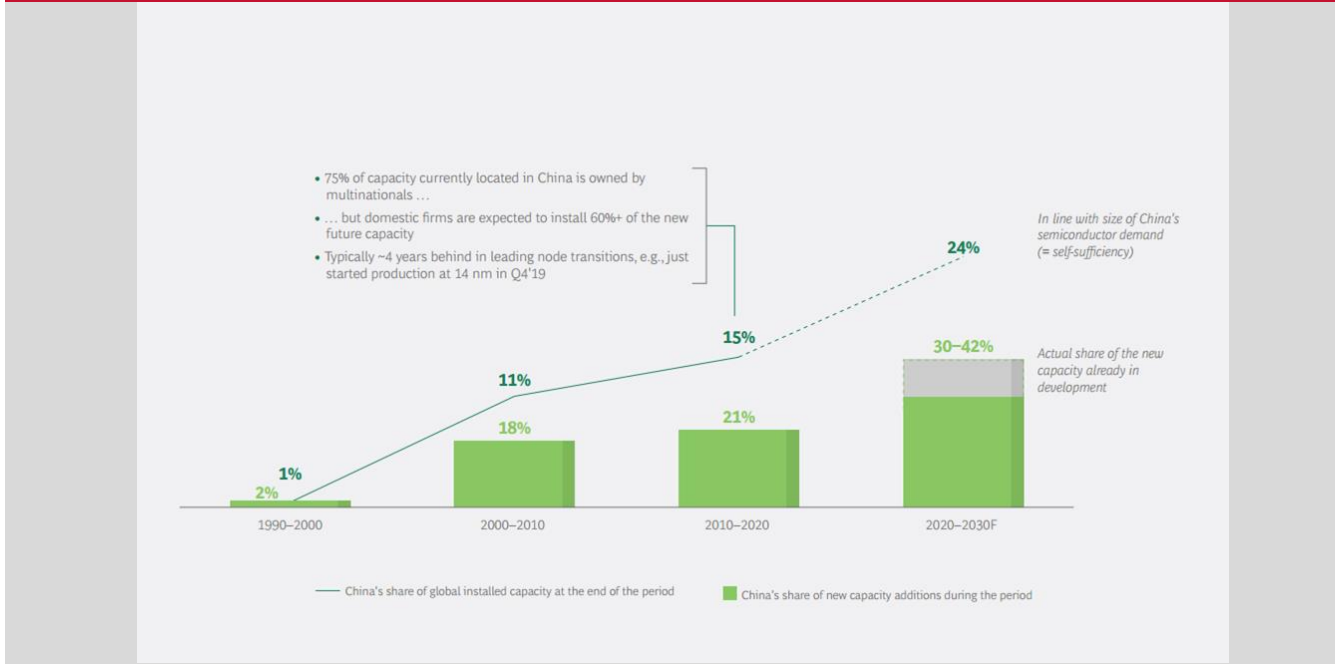
In comparison, US have long given up their dominance in terms of wafer capacity. Over the last 30 years, US manufacturing capacity had grown at a cumulative growth rate of 7% while global capacity increased by 11% annually during the same period. Increase in US wafer capacity has been outpaced by Taiwan, South Korea and China which have been pouring in heavy investment to secure themselves as manufacturing powerhouses.



China’s largest wafer fabrication company, Semiconductor Manufacturing International Corporation (SMIC), has been revising its capex budget aggressively higher from US\$3.1b earlier this year to US\$4.3b in May 2020 (+39% vs initial budget), and then to US\$5.9b in Nov 2020 (+90% vs initial budget) in response to the escalating US-China tech war. In comparison, the latest capex guidance is >3x higher than that of FY19 capex at US\$1.9b.

SMIC recently reported a 123% YoY jump in profit on 33% increase in revenue for 3QCY20, marking a new high for both revenue and profit. SMIC’s current utilisation rate is at 100% and it is guiding momentum to remain strong going into 1H 2021. DigiTimes also reported that 8-inch wafer foundries in general are experiencing orders at 20% beyond their supply capacity. The imminent shortage will likely continue into 2021 and urgent orders will see a 10% increase in pricing.

Exhibit 5: China's share of global manufacturing capacity



Source: SIA, BCG, VLSI

In addition, SMIC has also formed a JV with the Beijing Economic-Technological Development Area Management Committee (BDAC) to build a plant in Beijing, capable of producing 12-inch wafers at a rate of 100,000 per month. The first phase will incur an investment of US\$7.6b where SMIC is expected to cover 51% of the cost. Capex for the JV is separated from the recently announced US\$6.7b. While SMIC is stockpiling wafer fabrication equipment on an aggressive scale, we gather that the new purchases may not be fully deployed within the year. We believe that SMIC is pulling in equipment in advance to ensure a continuity of capacity expansion 1-2 years down the road in the event of a worsening US ban.

Given that SMIC is partially state-owned, it has strong financial backing from the "Big Fund Phase-2". On top of that, SMIC had also on July 2020 raised RMB53.2b or US\$7.8b (>2x 2019 revenue) via a secondary listing on the Shanghai stock exchange. SMIC share price tripled during its Shanghai debut and is currently trading at >200x Fwd. PER.

Malaysia — net beneficiary of the trade friction

Dubbed as the technology hub in Malaysia, Penang is home to >300 MNCs and >3,000 SMEs. The strategic location of Penang coupled with its well-planned infrastructure continue to attract foreign direct investments from the likes of US, Germany, Japan and Singapore.

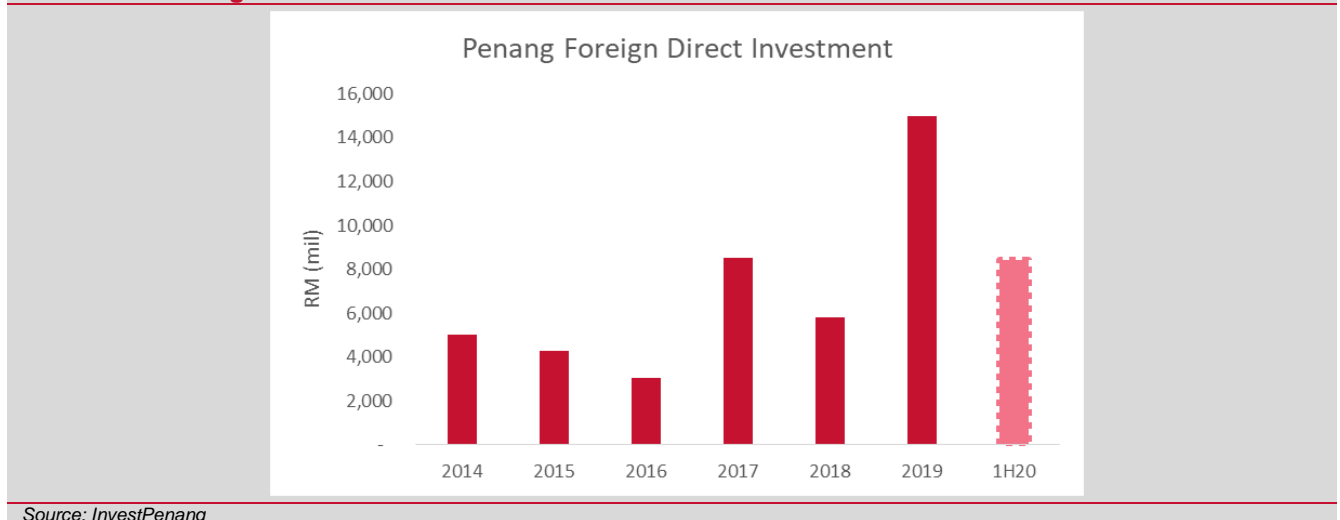
Exhibit 6: MNCs in Penang



Source: InvestPenang

As of 2019, the approved manufacturing investments in Penang almost tripled, hitting a record high of RM16.9b. This accounts for 20% of Malaysia’s 2019 manufacturing investment. Almost 90% of the RM16.9b was contributed by foreign direct investments (FDI) amounting to RM15b, placing Penang as the highest FDI state in Malaysia for 2019. According to the Malaysia Investment Development Authority (MIDA), these FDI involves 166 projects that are expected to create 18,886 new jobs in Penang.

Exhibit 7: Penang FDI



Source: InvestPenang

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The momentum continues as 1H 2020 recorded new investment of RM9.1b, representing 54% of 2019's figure. This year also saw MNCs such as Intel, Lam Research, Bosch, and B Braun announcing billion-ringggit plans to set up new plant in Penang as a result of trade diversion owing to the long standing US-China tension.

The need for fab expansion due to the surge in demand can also be observed in the local scene as SilTerra Malaysia Sdn Bhd (SilTerra), a loss-making wafer foundry, has attracted bids from foreign parties for potential takeover. There is an ongoing bidding war among Germany's X-FAB, Taiwan's Foxconn, Beijing CGP Investment Co Ltd (via a 40:60 consortium with DNex Bhd) and Green Packet Bhd.

There is no verdict yet but Foxconn was reportedly the highest bidder with US\$150m cash offer. While SilTerra (capable of ~90nm process node) is far from the cutting-edge players like TSMC and Samsung which are already producing 5nm node, it still offers some competition in the 8-inch wafer segment with the current condition turning into a seller market. SilTerra is capable of monthly production capacity of about 46,000 wafers.

Key local beneficiaries

- i. **KGB (Outperform; TP: RM1.92):** Kelington Group Berhad (KGB) provides ultra-high purity (UHP) gas delivery systems used in wafer foundries, which are currently being thrust into the limelight given record-high FDIs in Penang, imminent wafer shortages (thus requiring further expansions) and China's semiconductor localisation efforts. With Biden winning the US election, we believe sentiment overhang on SMIC and hence KGB is now cleared. In fact, SMIC is asking KGB to speed things up and hinted of more UHP-related jobs award in the pipeline. In addition, we believe market is grossly underestimating KGB's earnings potential as the stock only trades at 19.9x Fwd. PER, significantly cheaper than peers' average of 30-58x.
- ii. **MPI (Outperform; TP: RM18.80) and UNISEM (Outperform; TP: RM5.15):** Both companies are likely to benefit from China's semiconductor localisation efforts. We gather that the demand for back-end packaging and testing is expected to grow in tandem with the expansion of front-end wafer fab capacity. MPI and Unisem's plants in Suzhou and Chengdu, respectively, are experiencing a surge in orders from both matured and rising local IDM players. MPI is currently experiencing a rise in demand for power management chip packaging for server and laptop segment due to work-from-home surge. MPI has also ventured into to packaging for silicon carbide (SiC) power modules that will be the future go-to power component for EVs. Unisem on the other hand is benefiting from the higher orders for MEMS microphone packaging, underpinned by the adoption of wireless earbuds and virtual home assistance speakers.
- iii. **Mi Technovation (Unrated)** who specialises in OSAT equipment has seen revenue contribution from China increasing steadily. As of its latest 3QFY20 results, China accounted for 27% of the group's revenue. In comparison to FY19 numbers, China's contribution was only 15% of group revenue. Riding on the positive trend, **INARI (Outperform; TP: RM3.14)** has also formed a JV with Singapore-based MIT Semiconductor to develop OSAT equipment. Initial stage involves customising equipment for internal use followed by IP protection filing. This allows Inari to sell equipment to external OSAT as part of its effort to diversify revenue stream and move up the value chain.

Malaysian Technology Peers Comparison

Name	Last Price @ 25/09/20 (RM)	Market Cap (RM'm)	Shariah Compliant	Current FYE	Revenue Growth		Core Earnings Growth		PER (x) - Core Earnings			PBV (x)		ROE (%)	Net Div Yld (%)	Target Price (RM)	Rating
					1-Yr. Fwd.	2-Yr. Fwd.	1-Yr. Fwd.	2-Yr. Fwd.	Hist.	1-Yr. Fwd.	2-Yr. Fwd.	Hist.	1-Yr. Fwd.	1-Yr. Fwd.	1-Yr. Fwd.		
D&O GREEN TECHNOLOGIES BHD	1.44	1,650.0	Y	12/2019	0.0%	14.2%	-2.5%	56.7%	28.6	29.7	18.9	2.8	2.5	13.0%	1.1%	1.20	OP
INARI AMERTRON BHD	2.60	8,551.0	Y	06/2020	37.4%	24.9%	66.7%	25.1%	54.8	33.3	26.7	7.1	7.0	21.6%	2.5%	3.14	OP
JHM CONSOLIDATION BHD	2.11	1,180.5	Y	12/2020	5.9%	24.7%	3.6%	58.2%	23.8	22.9	14.5	3.6	3.0	13.1%	1.6%	2.00	OP
KELINGTON GROUP BHD	1.61	522.6	Y	12/2020	-11.3%	29.2%	-67.8%	230.0%	15.6	53.7	19.9	2.4	2.5	4.9%	0.5%	1.92	OP
KESM INDUSTRIES BERHAD	10.52	452.5	Y	07/2020	14.6%	5.3%	19158%	34.2%	3768	24.5	18.2	1.0	1.0	5.0%	1.1%	10.60	MP
MALAYSIAN PACIFIC INDUSTRIES BHD	23.22	4,910.5	Y	06/2020	8.0%	8.0%	16.0%	11.0%	19.5	16.7	15.1	1.7	1.8	11.8%	1.9%	18.80	OP
P.I.E. INDUSTRIAL BERHAD	2.22	848.7	Y	12/2020	13.5%	13.5%	24.3%	15.0%	15.5	36.3	14.6	1.3	1.2	3.5%	1.4%	1.45	MP
SKP RESOURCES BHD	1.86	2,331.5	Y	03/2020	23.7%	9.7%	67.3%	20.7%	27.5	16.4	13.6	3.3	3.0	18.0%	3.0%	1.83	OP
UNISEM (M) BERHAD	5.56	4,082.3	Y	12/2020	9.0%	17.6%	71.9%	47.7%	49.7	28.9	19.6	2.4	2.2	7.8%	1.4%	5.15	OP

Source: Kenanga Research

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Stock Ratings are defined as follows:**Stock Recommendations**

OUTPERFORM	: A particular stock's Expected Total Return is MORE than 10%
MARKET PERFORM	: A particular stock's Expected Total Return is WITHIN the range of -5% to 10%
UNDERPERFORM	: A particular stock's Expected Total Return is LESS than -5%

Sector Recommendations***

OVERWEIGHT	: A particular sector's Expected Total Return is MORE than 10%
NEUTRAL	: A particular sector's Expected Total Return is WITHIN the range of -5% to 10%
UNDERWEIGHT	: A particular sector's Expected Total Return is LESS than -5%

*****Sector recommendations are defined based on market capitalisation weighted average expected total return for stocks under our coverage.**

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KENANGA INVESTMENT BANK BERHAD (15678-H)

Level 17, Kenanga Tower, 237, Jalan Tun Razak, 50400 Kuala Lumpur, Malaysia
Telephone: (603) 2172 0880 Website: www.kenanga.com.my E-mail: research@kenanga.com.my