

# Singapore Company Focus

## AEM Holdings Ltd

Bloomberg: AEM SP | Reuters: AEM.SI

Refer to important disclosures at the end of this report

DBS Group Research . Equity

29 Nov 2019

### BUY

(Initiating Coverage)

Last Traded Price ( 28 Nov 2019): S\$1.71 (STI : 3,202.67)

Price Target 12-mth: S\$2.38 (39% upside)

Potential Catalyst: Increased sales guidance, acquisitions

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#### Price Relative



#### Forecasts and Valuation

FY Dec (\$m)	2018A	2019F	2020F	2021F
Revenue	262	308	361	394
EBITDA	41.6	60.6	69.3	76.6
Pre-tax Profit	40.0	56.3	64.2	69.8
Net Profit	33.5	46.7	53.3	57.9
Net Pft (Pre Ex.)	33.5	46.7	53.3	57.9
EPS (S cts)	12.4	17.3	19.7	21.5
EPS Pre Ex. (S cts)	12.4	17.3	19.7	21.5
EPS Gth (%)	(75)	39	14	9
EPS Gth Pre Ex (%)	(75)	39	14	9
Diluted EPS (S cts)	12.4	17.3	19.7	21.5
Net DPS (S cts)	3.41	4.33	4.94	5.37
BV Per Share (S cts)	33.3	46.2	61.0	77.1
PE (X)	14.4	10.3	9.1	8.3
PE Pre Ex. (X)	14.4	10.3	9.1	8.3
P/Cash Flow (X)	14.1	13.4	9.0	7.6
EV/EBITDA (X)	10.2	6.7	5.4	4.3
Net Div Yield (%)	1.9	2.4	2.8	3.0
P/Book Value (X)	5.4	3.9	2.9	2.3
Net Debt/Equity (X)	CASH	CASH	CASH	CASH
ROAE (%)	45.5	43.6	36.9	31.1

Consensus EPS (S cts): 16.3 17.0 16.3  
Other Broker Recs: B: 3 S: 0 H: 0

GIC Industry: Information Technology

GIC Sector: Technology Hardware & Equipment

Principal Business: AEM provides handling and test solutions to the most advanced manufacturers who operate in the 5G economy including microprocessors, high speed communications, IoT devices, and solar cells.

Source of all data on this page: Company, DBS Bank, Bloomberg Finance L.P.

### “Testing” new highs

- Initiating coverage with a BUY and TP of S\$2.38, representing a potential upside of 39%
- Key customer is increasing capex and production capacity
- New technology structurally increases test times, leading to higher demand for test handlers
- Diversification of revenue stream through new projects and customers

**Leveraging on increasing capex for key customer.** Intel has guided for a record-high capex of US\$16bn in FY19 on the back of developments in new technology. The company intends to continue to increase its 14-nm and 10-nm production capacities by 25% each in 2020 to meet customers' demand. This should drive demand for test handlers, where AEM is believed to be the sole supplier.

**New technology to drive longer test times, leading to higher demand for test handlers.** As technology nodes shrink, longer test times are required to perform more complex tests. In addition, systems and devices used in safety-critical markets such as automotive (driverless vehicles), industrial, and medical equipment, will require more stringent system level tests. These would lead to higher demand for test handlers.

**Diversification of revenue through new projects and customers.** AEM is working with its key customer to develop hybrid extensions for the customer's existing handlers as well as new technology used in quantum computing testing. Other initiatives include supplying cable testing solutions for Huawei's 5G rollout.

#### Valuation:

**Initiate with a BUY and TP of S\$2.38, offering a potential upside of 39%.** Our TP is pegged to 12.1x FY20F PE, and is well below its industry peers' FY20F PE of 17.8x. The share price trades closely to the semiconductor cycle and we believe that there will be a further re-rating of its valuation multiple as the cycle begins to pick up, driven by demand for new technology.

#### Key Risks to Our View:

Single-customer concentration risk, escalation or continued protraction of geopolitical events, and FX risk.

#### At A Glance

Issued Capital (m shrs)	270
Mkt. Cap (\$m/US\$m)	461 / 354
Major Shareholders (%)	
Leng Toh Ban	7.8
Standard Life Aberdeen	7.7
Morgan Stanley	6.0
Free Float (%)	73.0
3m Avg. Daily Val (US\$m)	7.9



Live more, Bank less

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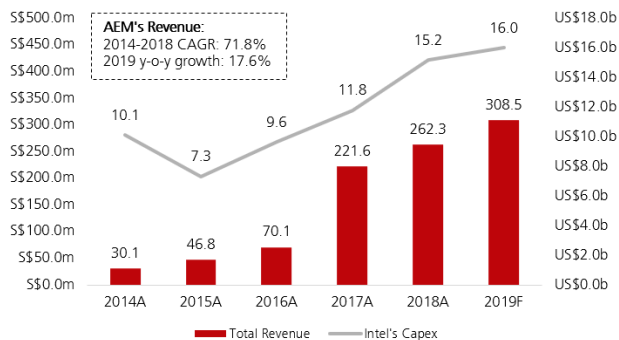
## Investment Summary

**Initiate with a BUY and TP of S\$2.38, representing a potential upside of 39%.** The entire semiconductor manufacturing value chain is poised to benefit from the demand driven by new technology (AI, 5G, and data centres). Intel is well positioned to ride on this trend. We believe that AEM is the sole supplier of key customer Intel's test handler, accounting for c.90% of total revenue, we are bullish on AEM's prospects. The share price trades closely to the semiconductor cycle and we believe that there will be a further re-rating of its valuation multiple as the cycle begins to pick up.

### Key customer is increasing capex

**AEM's key customer is increasing its FY19 capex guidance.** Intel upped its capex guidance to US\$16.0bn, from US\$15.5bn in July 2019. They believe that the world is at a key inflection point with exponential growth of data creating massive demand for semiconductors. 5G deployment, significant enabling of IoT by 5G, advancements in Artificial Intelligence (AI) and a rising demand for cloud computing are expected to fuel this growth. Intel's capex to increase production capacity translates into higher orders received by AEM as the company would require more test handlers from AEM to manage the back-end testing of its products. More test handlers are also expected to drive revenue for AEM's Consumables and Services business segment.

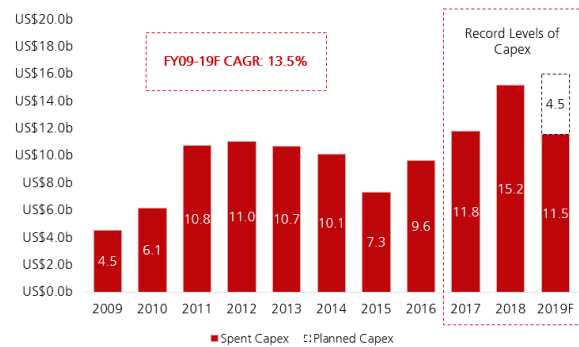
### AEM's Revenue vs. Intel's Capital Expenditure



Source: AEM, Intel, Bloomberg Finance L.P., DBS Bank

**No end in sight yet for Intel's record levels of capex.** In the last 10 years, Intel's capex has grown at a CAGR of 13.5%, and the company has achieved record levels of capex in the past three years in order to increase production capacity to meet market demand. As a result, Intel managed to increase its 14-nm production capacity by 25% for its production in 2019, and also ramped up its 10-nm production. However, the company has still been unable to keep up with PC demand. As such, Intel is planning to continue increasing its 14-nm and 10-nm production capacities by 25% each in 2020. Their spending to increase production capacity will in turn drive demand for AEM's equipment and services.

### Intel's Record Levels of Capital Expenditure



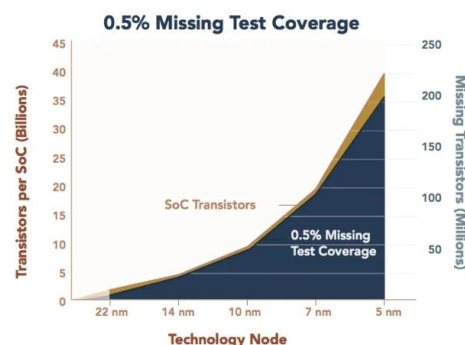
Source: Intel, Bloomberg Finance L.P., DBS Bank

### New technology to drive longer test times, leading to higher demand for test handlers

#### AI, 5G, and memory and storage will drive longer test times.

Intel intends to expand its 10-nm portfolio, (which will result in an increase in demand for the company's chips) as well as to develop and launch smaller and more advanced chips. As technology nodes get smaller, it means that there are more transistors packed into a chip. As such, the number of transistors in a 0.5% missing test coverage increases exponentially. As advancements in new technology (5G, IoT, AI, and quantum computing) are made, the systems and devices will need to be rigorously tested to higher standards through system level tests. This is to ensure that they do not fail in various safety-critical markets such as automotive (driverless vehicles), industrial, and medical equipment. More complex tests have to be performed and longer test times are required as the number of potential defects increase. As such, Intel will require more test handlers from AEM to cater to the longer test times and system level tests.

### Relationship between System-on-Chip Transistor Count and Missing Coverage



Source: Astronics, Semiconductor Engineering, DBS Bank

**Positive forecasts on industry trend in 2020**

**IDC reinforces Intel’s big bets.** International Data Corporation (IDC) is expecting sensors, connectivity, and AI and computer vision to drive semiconductor demand. The research company estimates consumer semiconductor segment to grow at a CAGR of 6.4% from 2018-2023 on the back of consumer IoT devices and home automation gaining traction and scale. It is also forecasting worldwide shipments of AI-optimised processors for edge systems to reach 340.1 million units in 2019, an increase of 170.0% y-o-y, and 1.5 billion units by 2023, achieving a five-year CAGR of 64.9%. The penetration rate of edge systems adopting optimised processors is anticipated to increase from 5.1% in 2018 to 40.5% in 2023. This validates and reinforces Intel’s big bets on new technology, further solidifying our belief in the company’s increased demand for AEM’s test handlers.

Product Segment	2018-2023F CAGR (%)
Consumer semiconductor	6.4
AI-optimised processors	64.9
x86 servers	11.3
Solid-state drives	9.8

Source: IDC, DBS Bank

**Shipment and inventory trend turning positive**

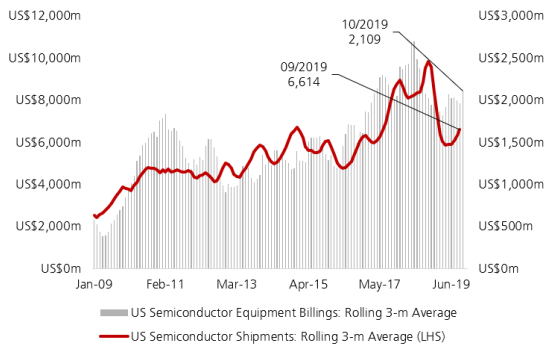
**Semiconductor shipment volumes are recovering on the back of a demand-supply rebalance.** In 2017, the semiconductor market boomed as its top three end-markets, namely PCs, mobile phones, and data centres, drove demand. As semiconductor companies ramped up production, end-market companies accelerated their orders in the face of an escalating trade war, providing an additional leg to semiconductor shipments in 2018. As geopolitical tensions weighed on end-market demand, and companies restructured their supply chain by relocating their manufacturing facilities out of China, semiconductor shipments began to fall in 4Q18. However, as new technology ushers in the demand for more advanced chips, semiconductor shipments bottomed out in April 2019, and a recovery in shipment volumes in recent months indicate that the semiconductor cycle is beginning to turn upwards.

**Worldwide Semiconductor Shipments**



Source: CEIC, Semiconductor Industry Association, DBS Bank

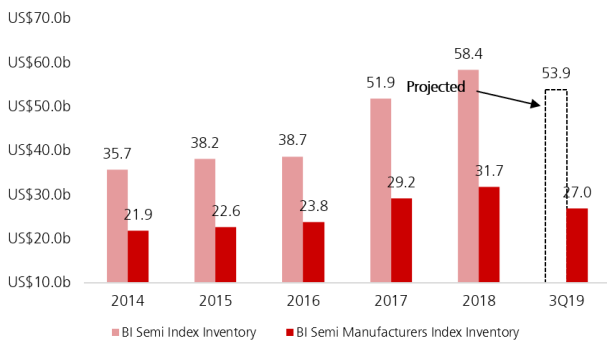
**US Semiconductor Shipments and Equipment Billings**



Source: CEIC, SEMI, Semiconductor Industry Association, DBS Bank

**Inventory de-stocking.** Inventory levels, which are a function of both projected demand as well as current demand, are trending down. Semiconductor companies build up their inventories mainly in anticipation of a surge in demand due to new technology. Other factors such as a possible escalation of US-China tariffs and weakening demand due to the geopolitical issues also contributed to the build-up in inventory levels. However, in the most recent quarter, we are beginning to see a drawdown in inventory levels for both the semiconductor manufacturers (BI Semi Manufacturers Index Inventory) and the chip makers (BI Semi Index Inventory).

**Major Semiconductors' and Semiconductor Manufacturers' Inventory**



Source: Bloomberg Finance L.P., DBS Bank

**Diversification of revenue through new projects and customers**

**Developing hybrid extensions to existing handlers for its key customer.** AEM is currently working with its key customer, Intel, to provide hybrid extensions for their existing handlers. These hybrid extensions will expand on AEM's existing test handler's capabilities and potentially enable AEM to gain a larger wallet share from Intel. As of 3Q19, the company had successfully installed the Beta unit of the hybrid extensions. These new projects are expected to contribute meaningful revenue from 2020 onwards.

**AEM leaps into quantum computing through Afore.** AEM's wholly-owned subsidiary, Afore, together with its partner, has

developed a new solution for Intel's quantum computing program, which we believe will help the Group penetrate into new markets in the quantum computing field.

For quantum computing to work, superconducting chips known as superconducting qubits are required. These chips attain superconducting characteristics at critically low temperatures and thus this as an additional criterion required for testing. In February 2019, Afore, together with Bluefors, developed a first-of-its-kind tool for wafer level probing at cryogenic temperatures of below 4 Kelvin (K). AEM is currently in discussions to get orders for its Cryogenic Wafer Prober for testing quantum computing wafer at temperatures below 2K.

**Customer diversification in all key business segments.**

In 9M19, AEM's revenue from its System Level Test & Inspection (SLT-i), Micro-Electro-Mechanical Systems (MEMS), and Test & Measurement Solutions (TMS) increased 39.3% y-o-y as the company gained orders from new and existing customers. As system level tests become increasingly important under new technology, AEM is currently engaging new semiconductor and memory customers for its SLT-i business. For the MEMS segment, AEM has also received an order from a major German sensor supplier in the automotive and consumer industries for a wafer level test handler for environment sensors.

In addition, AEM has won a contract to supply cable testing solutions for Huawei's 5G rollout in 2019 under its TMS business. While the contributions of these businesses are still small, we are positive on AEM's initiative given the potential and development in the 5G space.

## Valuation & Peers Comparison

### Valuation

FY20F forward PE of 12.1x implies a target price of S\$2.38, representing an upside of 39%. AEM's forward PE trades closely to the semiconductor billing cycle. We believe that there will be further upward re-rating of AEM's valuation multiple as the semiconductor cycle begins to turn around, driven and catalysed by the 5G rollout and demand from new technology. Our PE multiple of 12.1x is close to the +1SD and is based on a 25% discount to its 2-year high, at the peak of the previous semiconductor cycle. AEM is currently trading at 9.1x FY20F forward PE, which is a deep discount to its industry peer average of 17.8x. In our view, the single-customer concentration risk is weighing heavily on its valuation multiple.

AEM is currently trading at +0.8SD, above its 2-year average forward PE. AEM's valuation multiple has begun its re-rating as the semiconductor cycle has started to recover. It had surpassed its 2-year average forward PE in October and is currently trading at +0.8SD its 2-year average. We believe there is still further upside as it is still trading below its valuation multiple during the cycle boom, of c.16x in March 2018.

### AEM's Forward PE and Equipment Billings



Source: CEIC, Semiconductor Industry Association, Company, DBS Bank

### AEM's 2-Year Forward PE



Source: Bloomberg Finance L.P., Company, DBS Bank

### Key Assumptions

Revenue growth of 17.6%/17.2%/9.0% in FY19F/20F/21F. We are optimistic on Intel's increase in capex and focus, as well as AEM's various initiatives to drive revenue through new projects from its key customer and securing new customers.

1. Equipment and Systems Solutions revenue as a percentage of Intel's capex to increase by 10 basis points (bps) each year as Intel would require more test handlers to increase its production as well as orders for AEM's cryogenic wafer-level prober.
2. MEMS TAM to grow at a CAGR of 10%; market share to increase by 20bps due to synergies from customer access and technology between AEM and Afore.

Gross profit margins of 37.0%/ 36.5%/ 36.5% in FY19F/ 20F/ 21F. Gross profit margins to decline slightly due to a higher mix of tools and machines to Intel, which have lower margins than its consumables and services.

EBIT margins of 18.2%/ 17.6%/ 17.6% in FY19F/ 20F/ 21F.

EBIT margins are projected to decline slightly. Due to:

1. Lower gross profit margins; and
2. Higher distribution costs and wages as a percentage of revenue

### Peer Comparison Table

Bloomberg Ticker	Company Name	Market Data		Financial Data				Valuation				
		Primary Exchange	Market Cap (US\$m)	Sales (US\$m)	Net Profit (US\$m)	Net Profit Margin (%)	Debt (US\$m)	EV/EBITDA		P/E		
								FY19F	FY20F	FY18	FY19F	FY20F
<b>Singapore</b>												
AEM SP Equity	AEM Holdings Ltd	Singapore	337.8	194.5	24.8	12.8%	0.2	9.3x	7.7x	19.1x	13.7x	12.1x
COHU US Equity	Cohu Inc	NASDAQ GS	737.0	451.8	-32.2	-7.1%	352.8	15.1x	10.1x	N/A	127.6x	17.4x
XCRA US Equity	Xcerra Corp	Acquired in 2018	N/A	390.8	22.6	5.8%	21.3	N/A	N/A	N/A	13.7x	12.5x
6857 JP Equity	Advantest Corp	Tokyo	9,757.7	2,547.8	514.1	20.2%	0.0	17.5x	14.3x	19.6x	27.0x	21.2x
522 HK Equity	ASM Pacific Technology Ltd	Hong Kong	5,371.9	2,494.5	282.7	11.3%	445.0	23.1x	12.8x	42.1x	66.2x	20.2x
<b>Average</b>			<b>4,051.1</b>	<b>1,215.9</b>	<b>162.4</b>	<b>8.6%</b>	<b>163.9</b>	<b>16.2x</b>	<b>11.2x</b>	<b>26.9x</b>	<b>49.6x</b>	<b>16.7x</b>
<b>Peer Average (Excluding AEM)</b>			<b>5,288.8</b>	<b>1,471.2</b>	<b>196.8</b>	<b>7.5%</b>	<b>204.8</b>	<b>18.6x</b>	<b>12.4x</b>	<b>30.9x</b>	<b>58.6x</b>	<b>17.8x</b>

Source: Bloomberg Finance L.P., Company, DBS Bank

## Key Risks

**Single-customer concentration risk.** Intel is AEM's major customer, accounting for 94.0% of AEM's revenue in FY18. As such, AEM is heavily dependent on Intel's orders for its revenue. Furthermore, c.50% of its revenue in FY18 stemmed from tools and machines, which is lumpy in nature and dependent on Intel's needs for its production capacity.

However, due to AEM's customised solutions that stems from its 17-year working relationship with Intel, AEM is able to substantially reduce the cost of testing for its major customer. As such, Intel relies heavily on AEM for its test handlers. In addition, given our positive outlook on the areas Intel is focusing on and that Intel is a world-class semiconductor company, we believe AEM will continue to grow with its major customer and this is more of a boon than a bane.

**Escalation or continued prolonging of geopolitical events.**

Several major geopolitical events (US-China trade war, Japan-Korea trade feud, and the Hong Kong protests) have been ongoing for prolonged periods and are beginning to weigh on global growth. Earlier in October, the International Monetary

Fund (IMF) downgraded its 2019 global growth forecast from 3.3% in April to 3.0%, citing among others, the escalation of trade tensions between the US and China, faster-than-expected slowdown in China, political crisis in Hong Kong, and trade tensions between Japan and South Korea. These events have hampered global growth and disrupted supply chains, and a further escalation or protraction could slow down the development of new technology which would impact the demand for semiconductors.

**Foreign exchange risk.** In FY18, AEM recorded S\$1.9m of foreign exchange losses, accounting for 5.7% of FY18's net profit. AEM's foreign currency transactions are mainly denominated in USD, MYR, and RMB. Two of its largest sales regions are Malaysia and China which accounted for 34.4% and 27.3% of FY18 sales respectively. However, AEM sources its raw materials mainly in USD and SGD. In addition, its main production operations are in Singapore, where the operating expenses are denominated in SGD. As such, AEM is exposed to foreign exchange translation risk, and the company partially hedges these exposures through forward contracts.

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## SWOT Analysis

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<b>Strengths</b>	<b>Weakness</b>
<ul style="list-style-type: none"><li>• High quality of results through test solutions without exponentially increasing the cost of testing</li><li>• High barriers of entry as it provides niche, customised solutions for its key customer</li><li>• Strong, long-term relationship with key customer</li></ul>	<ul style="list-style-type: none"><li>• Solutions are non-transferrable as they are customised for its customer</li><li>• c.50% of the company's sales are lumpy and dependent on its key customer's production capacity needs</li></ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"><li>• Increase its presence in different parts of the value chain through acquisitions</li><li>• Pursue additional projects with its existing key customer</li><li>• Mergers &amp; Acquisitions (M&amp;A) opportunities</li></ul>	<ul style="list-style-type: none"><li>• Single key customer risk</li><li>• Trade war slowing the demand for new technology developments</li></ul>

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Source: DBS Bank



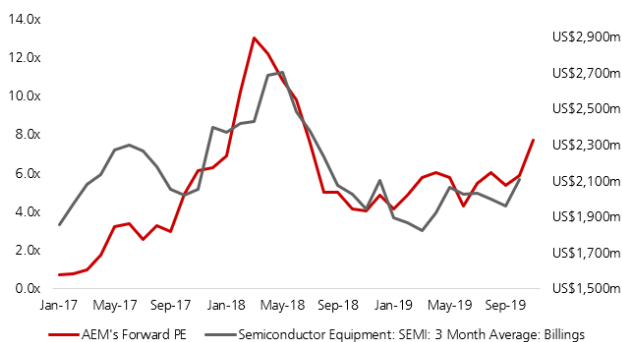
**Critical Factors**

**Intel’s capital expenditure guidance.** AEM supplies test handlers to facilitate the back-end testing of Intel’s semiconductors. However, prior to and after the sale of its test handlers, AEM provides diversified services ranging from the design and engineering of the product, to the field support and replacement of parts to Intel. This allows AEM to capture different types of revenue streams including equipment sales, recurring kit/consumable sales, and services. The amount that Intel spends on AEM’s solutions can be proxied by its guided capex. As such, one of immediate drivers of AEM’s revenue is Intel’s capex. Intel has continued to increase its capex, hitting record levels in recent years. In addition, given its area of focus in the expanding new technology, we are positive that this will spill over to benefit AEM.

**Intel’s production capacity and production levels.** As Intel decides to increase its production capacity and/or production levels, it would require more test handlers to meet the increase in back-end testing of its chips. As of 9M19, Intel had sufficient test handlers from AEM to meet all of its current production capacity. However, in Intel’s 9M19 earnings call, the company guided that it will be increasing the production capacities of its 14-nm and 10-nm chips by 25% each in 2020. We believe Intel will procure more test handlers from AEM to cater to its increase in production capacity.

**Semiconductor equipment billings.** AEM’s forward PE trades closely to the semiconductor billing cycle. An upward cycle would cause the stock’s PE to be re-rated upwards, and vice versa in a down cycle.

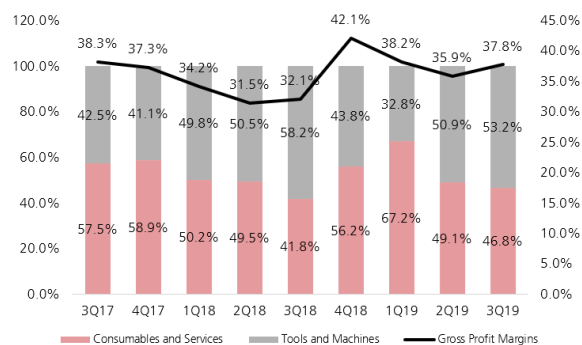
**AEM’s Forward PE and Equipment Billings**



Source: CEIC, Semiconductor Industry Association, Company, DBS Bank

**Proportion of sales mix.** AEM’s Consumables and Services have slightly higher margins as compared to its Tools and Machines segment. As such, a higher sales proportion of Consumables and Services would result in higher gross profit margins.

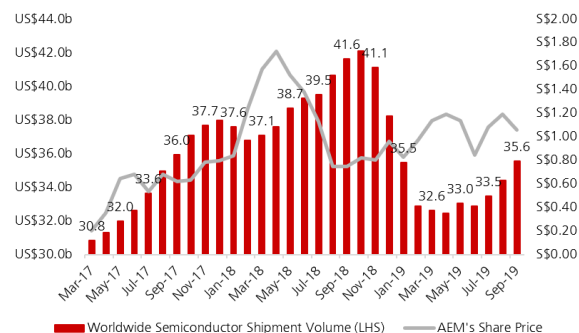
**AEM’s Type of Revenue Stream and Gross Profit Margins**



Source: Company, Bloomberg Finance L.P., DBS Bank

**Expectations on the semiconductor cycle.** Worldwide semiconductor shipment volumes are a proxy for the demand for semiconductors. As the demand for semiconductors increases, more chips would have to be manufactured and tested. As such, AEM’s earnings move in tandem with the semiconductor cycle and expectations of an uptrend in the cycle (shipment volume) will cause its share price to rise. Worldwide semiconductor shipment volumes bottomed in April 2019 and have been on a recovery trend since. With a positive outlook on semiconductor demand, especially in 5G, IoT, AI and quantum computing, which are Intel’s areas of focus, we are bullish on semiconductor shipment volumes and AEM.

**Worldwide Semiconductor Shipment Volume**

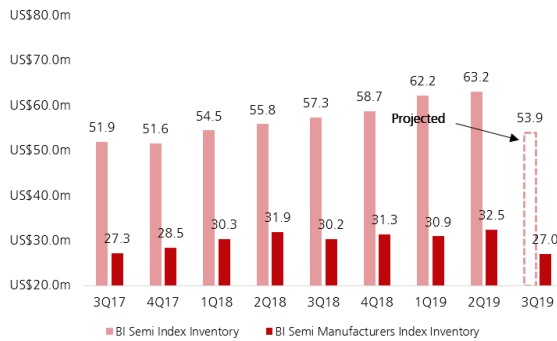


Source: CEIC, Semiconductor Industry Association, DBS Bank

**Major semiconductors’ and semiconductor manufacturers’ inventory volume.** Inventory levels are a function of both projected demand as well as current demand. Semiconductor companies build up their inventories mainly in anticipation of a surge in demand due to new technology. Other factors such as a possible escalation of US-China tariffs and weakening demand due to geopolitical issues also contributed to the build-up in inventory levels. However, in the most recent quarter, we are

beginning to see a drawdown in inventory levels for semiconductor manufacturers, indicating lower inventory levels and higher demand on the end of semiconductor companies.

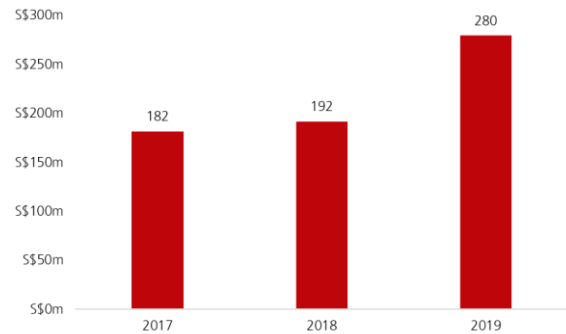
**Major Semiconductors' and Semiconductor Manufacturers' Inventory**



Source: Bloomberg Finance L.P., DBS Bank

**The size of AEM's order book.** AEM aims to provide guidance on its revenue to the best of its ability through its order book. The company will announce order wins as and when it has secured a contract with customers. The company's order wins are translated into revenue and in the last three years, AEM has managed to consistently increase its order book.

**AEM's Order Book**



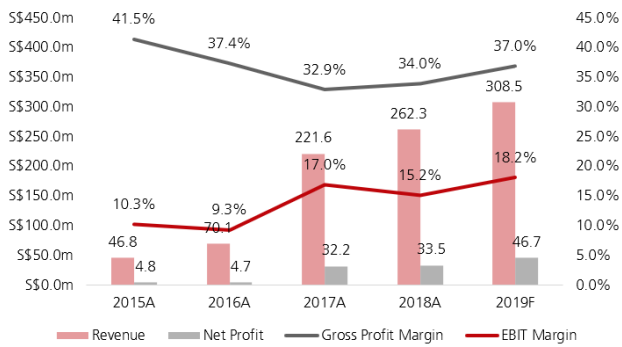
Source: Company, DBS Bank

**Complexity of chip-testing requirements.** The demand for its test handlers is affected by the total test time required by Intel, which is a function of 1) The test complexity of the semiconductors chips, and 2) The number of semiconductor chips it has to test. A product that requires more complex testing will require a longer test time, which will result in more test handlers in order to meet the same production levels. New technology will drive longer test times due to more complex and rigorous testing involved. In addition, as test handlers are utilised at a higher rate, the consumables will have to be replaced more frequently due to wear-and-tear.

**Financials**

**Increasing sales, earnings, and profitability.** In the past five years, AEM has grown its sales mainly organically through its key customer. As its key customer began to order more consumables for its test handlers which have higher margins, AEM’s gross profit margins rose in tandem. Moving forward, besides organic growth, we are anticipating sales to also be driven inorganically via M&A, and through new customers.

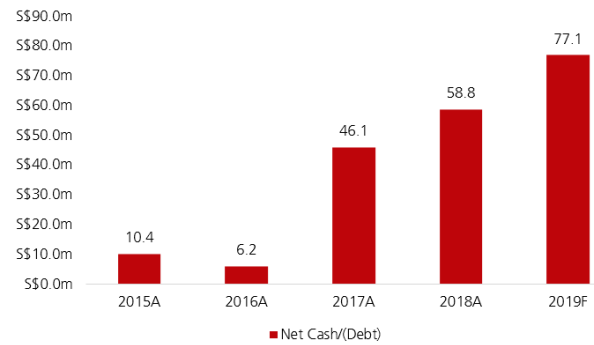
**AEM’s Sales and Profitability**



Source: Company, DBS Bank

**Net cash position with no debt.** As of 3Q19, AEM had no borrowings, and had a cash balance of S\$64.8m. In the last five years, AEM has had close to negligible debt levels and has been financing its operations and acquisitions through its own cash. AEM is currently on the lookout for potential acquisitions that will synergise with its business and we believe the company is maintaining its current level of cash for that purpose.

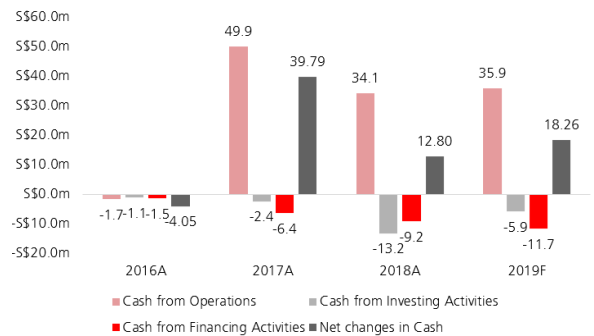
**AEM’s Cash/(Debt) Level**



Source: Company, DBS Bank

**Strong cash flows.** Since 2017, AEM has been generating positive cash flows which are attributable to its strong cash flow from operations and prudence in cash management.

**AEM’s Cash/(Debt) Level**



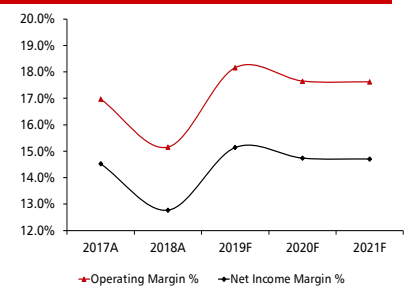
Source: Company, DBS Bank

## Income Statement (\$\$m)

FY Dec	2016A	2017A	2018A	2019F	2020F	2021F
Revenue	70.1	222	262	308	361	394
Cost of Goods Sold	(43.9)	(149)	(173)	(194)	(229)	(250)
<b>Gross Profit</b>	<b>26.2</b>	<b>73.0</b>	<b>89.1</b>	<b>114</b>	<b>132</b>	<b>144</b>
Other Opng (Exp)/Inc	(19.7)	(35.4)	(49.4)	(58.1)	(68.1)	(74.4)
<b>Operating Profit</b>	<b>6.55</b>	<b>37.6</b>	<b>39.8</b>	<b>56.0</b>	<b>63.8</b>	<b>69.4</b>
Other Non Opg (Exp)/Inc	0.0	0.0	0.0	0.0	0.0	0.0
Associates & JV Inc	(0.5)	(0.1)	0.0	0.0	0.0	0.0
Net Interest (Exp)/Inc	0.0	0.04	0.26	0.26	0.39	0.39
Exceptional Gain/(Loss)	(0.1)	0.0	0.0	0.0	0.0	0.0
<b>Pre-tax Profit</b>	<b>5.98</b>	<b>37.5</b>	<b>40.0</b>	<b>56.3</b>	<b>64.2</b>	<b>69.8</b>
Tax	(1.3)	(5.4)	(6.5)	(9.6)	(10.9)	(11.9)
Minority Interest	0.0	0.0	0.0	0.0	0.0	0.0
Preference Dividend	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net Profit</b>	<b>4.66</b>	<b>32.2</b>	<b>33.5</b>	<b>46.7</b>	<b>53.3</b>	<b>57.9</b>
Net Profit before Except.	4.77	32.2	33.5	46.7	53.3	57.9
EBITDA	6.95	38.2	41.6	60.6	69.3	76.6
<b>Growth</b>						
Revenue Gth (%)	49.8	216.0	18.4	17.6	17.2	9.0
EBITDA Gth (%)	14.0	449.5	8.9	45.7	14.4	10.6
Opg Profit Gth (%)	35.3	474.5	5.7	40.9	13.9	8.8
Net Profit Gth (Pre-ex)	(1.5)	575.3	4.1	39.4	14.1	8.8
<b>Margins &amp; Ratio</b>						
Gross Margins (%)	37.4	32.9	34.0	37.0	36.5	36.5
Opg Profit Margin (%)	9.3	17.0	15.2	18.2	17.6	17.6
Net Profit Margin (%)	6.6	14.5	12.8	15.1	14.7	14.7
ROAE (%)	17.0	73.1	45.5	43.6	36.9	31.1
ROA (%)	10.9	39.0	26.5	29.0	25.4	22.3
ROCE (%)	17.1	72.4	44.7	42.6	36.3	30.8
Div Payout Ratio (%)	16.6	24.9	27.4	25.0	25.0	25.0
Net Interest Cover (x)	1,309.0	NM	NM	NM	NM	NM

Source: Company, DBS Bank

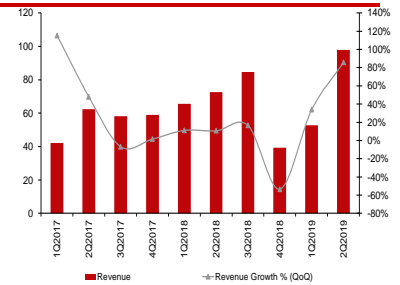
## Margins Trend



## Quarterly / Interim Income Statement (\$5m)

FY Dec	1Q2018	2Q2018	3Q2018	4Q2018	1Q2019	2Q2019
Revenue	65.7	72.7	84.7	39.4	52.7	97.9
Cost of Goods Sold	(43.2)	(49.8)	(57.5)	(22.8)	(32.6)	(62.8)
<b>Gross Profit</b>	<b>22.4</b>	<b>22.9</b>	<b>27.2</b>	<b>16.6</b>	<b>20.2</b>	<b>35.2</b>
Other Oper. (Exp)/Inc	(12.3)	(11.4)	(13.5)	(12.2)	(12.3)	(16.3)
<b>Operating Profit</b>	<b>10.1</b>	<b>11.5</b>	<b>13.7</b>	<b>4.35</b>	<b>7.82</b>	<b>18.9</b>
Other Non Opg (Exp)/Inc	0.0	0.0	0.0	0.0	0.0	0.0
Associates & JV Inc	(0.2)	0.0	0.0	0.25	0.09	0.05
Net Interest (Exp)/Inc	0.06	0.04	0.07	0.09	0.08	0.07
Exceptional Gain/(Loss)	0.0	0.0	0.0	0.0	0.0	0.0
<b>Pre-tax Profit</b>	<b>10.0</b>	<b>11.5</b>	<b>13.8</b>	<b>4.68</b>	<b>7.98</b>	<b>19.0</b>
Tax	(1.8)	(2.0)	(2.4)	(0.3)	(1.4)	(3.3)
Minority Interest	0.0	0.0	0.0	0.0	0.0	0.0
<b>Net Profit</b>	<b>8.22</b>	<b>9.50</b>	<b>11.4</b>	<b>4.39</b>	<b>6.60</b>	<b>15.7</b>
Net profit bef Except.	8.22	9.50	11.4	4.39	6.60	15.7
EBITDA	9.96	11.5	13.7	4.59	7.91	18.9

## Revenue Trend



Mainly due to a reduction in orders from its main customer

## Growth

Revenue Gth (%)	11.2	10.7	16.5	(53.5)	34.0	85.7
EBITDA Gth (%)	(5.8)	15.3	19.2	(66.4)	72.1	139.3
Opg Profit Gth (%)	(5.5)	13.4	19.1	(68.2)	79.8	141.4
Net Profit Gth (Pre-ex)	(15.4)	15.5	19.9	(61.4)	50.2	138.1

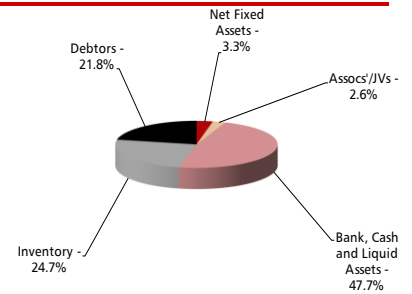
## Margins

Gross Margins (%)	34.2	31.5	32.1	42.1	38.2	35.9
Opg Profit Margins (%)	15.4	15.8	16.2	11.0	14.8	19.3
Net Profit Margins (%)	12.5	13.1	13.5	11.2	12.5	16.0

Source: Company, DBS Bank

**Balance Sheet (\$m)**

FY Dec	2016A	2017A	2018A	2019F	2020F	2021F
Net Fixed Assets	2.23	3.62	5.73	5.26	6.89	6.93
Invt in Associates & JVs	4.50	4.13	4.15	4.15	4.15	4.15
Other LT Assets	0.14	3.45	17.8	19.6	20.4	21.2
Cash & ST Invt	6.31	46.1	58.9	77.2	109	150
Inventory	17.4	35.8	27.4	40.0	47.4	51.6
Debtors	17.8	23.6	18.0	35.2	41.3	46.6
Other Current Assets	0.0	0.0	4.49	4.49	4.49	4.49
<b>Total Assets</b>	<b>48.4</b>	<b>117</b>	<b>136</b>	<b>186</b>	<b>234</b>	<b>285</b>
ST Debt	0.08	0.01	0.0	0.0	0.0	0.0
Creditor	16.7	52.2	33.1	45.3	52.2	59.1
Other Current Liab	1.05	6.04	10.6	12.9	14.2	15.2
LT Debt	0.01	0.0	0.05	0.0	0.0	0.0
Other LT Liabilities	0.32	0.59	3.21	3.21	3.21	3.21
Shareholder's Equity	30.2	57.8	89.5	125	164	208
Minority Interests	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Cap. &amp; Liab.</b>	<b>48.4</b>	<b>117</b>	<b>136</b>	<b>186</b>	<b>234</b>	<b>285</b>
Non-Cash Wkg. Capital	17.5	1.10	6.22	21.6	26.8	28.5
Net Cash/(Debt)	6.23	46.1	58.8	77.2	109	150
Debtors Turn (avg days)	73.3	34.0	28.9	31.4	38.6	40.7
Creditors Turn (avg days)	118.0	85.1	90.9	75.3	79.4	83.6
Inventory Turn (avg days)	111.7	65.7	67.4	64.9	71.2	74.3
Asset Turnover (x)	1.6	2.7	2.1	1.9	1.7	1.5
Current Ratio (x)	2.3	1.8	2.5	2.7	3.1	3.4
Quick Ratio (x)	1.4	1.2	1.8	1.9	2.3	2.7
Net Debt/Equity (X)	CASH	CASH	CASH	CASH	CASH	CASH
Net Debt/Equity ex MI (X)	CASH	CASH	CASH	CASH	CASH	CASH
Capex to Debt (%)	(4,125.9)	34,971.4	27,632.7	N/A	N/A	N/A

**Asset Breakdown**

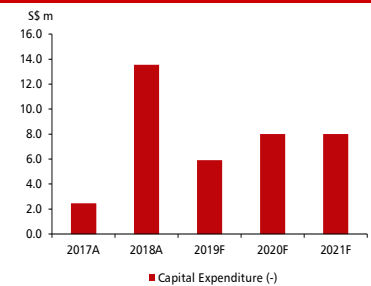
Source: Company, DBS Bank

## Cash Flow Statement (\$Sm)

FY Dec	2016A	2017A	2018A	2019F	2020F	2021F
Pre-Tax Profit	5.98	37.5	40.0	56.3	64.2	69.8
Dep. & Amort.	0.86	0.70	1.87	4.56	5.52	7.22
Tax Paid	0.01	(0.3)	(5.2)	(7.3)	(9.6)	(10.9)
Assoc. & JV Inc/(loss)	0.45	0.11	0.04	0.0	0.0	0.0
Chg in Wkg.Cap.	(9.0)	10.1	(4.7)	(17.7)	(6.5)	(2.6)
Other Operating CF	0.01	1.74	2.02	0.0	0.0	0.0
<b>Net Operating CF</b>	<b>(1.7)</b>	<b>49.9</b>	<b>34.1</b>	<b>35.9</b>	<b>53.6</b>	<b>63.5</b>
Capital Exp.(net)	3.51	(2.5)	(13.5)	(5.9)	(8.0)	(8.0)
Other Invts.(net)	0.0	0.0	0.0	0.0	0.0	0.0
Invts in Assoc. & JV	(4.7)	0.0	0.0	0.0	0.0	0.0
Div from Assoc & JV	0.0	0.0	0.0	0.0	0.0	0.0
Other Investing CF	0.02	0.07	0.30	0.0	0.0	0.0
<b>Net Investing CF</b>	<b>(1.1)</b>	<b>(2.4)</b>	<b>(13.2)</b>	<b>(5.9)</b>	<b>(8.0)</b>	<b>(8.0)</b>
Div Paid	(0.7)	(4.5)	(8.4)	(11.7)	(13.3)	(14.5)
Chg in Gross Debt	(0.1)	(0.1)	(0.3)	(0.1)	0.0	0.0
Capital Issues	0.0	0.15	0.63	0.0	0.0	0.0
Other Financing CF	(0.8)	(2.0)	(1.2)	0.0	0.0	0.0
<b>Net Financing CF</b>	<b>(1.5)</b>	<b>(6.4)</b>	<b>(9.2)</b>	<b>(11.7)</b>	<b>(13.3)</b>	<b>(14.5)</b>
Currency Adjustments	0.29	(1.4)	1.17	0.0	0.0	0.0
Chg in Cash	(4.1)	39.8	12.8	18.3	32.3	41.0
Opg CFPS (S cts)	17.1	60.7	14.4	19.9	22.3	24.5
Free CFPS (S cts)	4.31	72.4	7.64	11.1	16.9	20.6

Source: Company, DBS Bank

## Capital Expenditure



## Company Background

### Business Operations

AEM is a solutions provider for the back-end testing of the semiconductor manufacturing process. The company's key customer develops its own testers and AEM works with this customer by providing customised test handlers for burn-in tests, functional tests, and system-level tests.

### Types of Back-end Semiconductor Tests

Types of Back-end Tests	Functional Purpose
Burn-in tests	<ul style="list-style-type: none"> <li>To test for infant mortality</li> </ul>
Functional tests	<ul style="list-style-type: none"> <li>To test for the electrical characteristics of an integrated circuit</li> </ul>
System-level tests	<ul style="list-style-type: none"> <li>Loads the operating system and tests the IC in machine mode</li> </ul>

Source: Company, DBS Bank

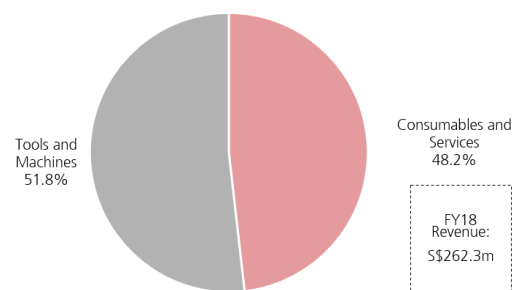
AEM works closely with its key customer in various stages to deliver test handlers. These various stages are packaged and termed "solutions". The early stages of the company's solutions include the designing and engineering of equipment and consumables. AEM then manufactures the equipment and consumables, and provides field support and post-sales replacements.

### AEM's Solutions Lifecycle

Lifecycle Stage	Business	Revenue Model
1. Design	<ul style="list-style-type: none"> <li>Automation research</li> <li>Automation design</li> </ul>	<ul style="list-style-type: none"> <li>Services</li> </ul>
2. Engineering	<ul style="list-style-type: none"> <li>Tools engineering</li> <li>Kits development</li> </ul>	<ul style="list-style-type: none"> <li>Services</li> </ul>
3. Manufacturing	<ul style="list-style-type: none"> <li>Equipment sales</li> <li>New kits and pans</li> </ul>	<ul style="list-style-type: none"> <li>Equipment sales</li> <li>Services</li> </ul>
4. Field Support	<ul style="list-style-type: none"> <li>24/7 site support</li> <li>Spares and RMA</li> </ul>	<ul style="list-style-type: none"> <li>Recurring kit/consumable sales</li> <li>Services</li> </ul>
5. Upgrades	<ul style="list-style-type: none"> <li>Upgrade engineering</li> </ul>	<ul style="list-style-type: none"> <li>Equipment sales</li> <li>Services</li> </ul>
6. Replacement	<ul style="list-style-type: none"> <li>Identify next-generation solution</li> <li>Start new equipment life cycle</li> </ul>	<ul style="list-style-type: none"> <li>To capture next commercial life cycle</li> </ul>

Source: Company, DBS Bank

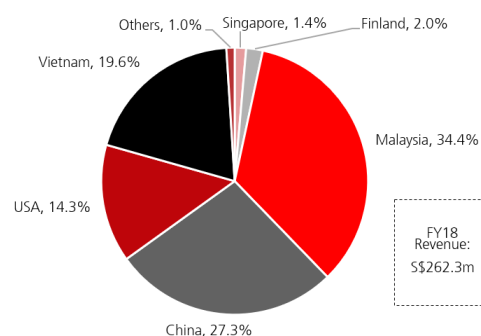
### FY18 Revenue by Business Segments



Source: Company, DBS Bank

AEM has four manufacturing plants which are located in Singapore, Malaysia (Penang), China (Suzhou) and Finland (Lieto). Its network of sales and field service offices, associates and distributors allow it to have a global market presence, with Malaysia and China accounting for a total of 61.7% of its revenue in FY18.

### FY18 Revenue by Geography



Source: Company, DBS Bank



## Management & Strategy

### Key Management Team

Name	Background & Experiences
Loke Wai San, 50	<p><b>Executive Chairman and Director.</b> Mr. Loke Wai San has been the Chairman of AEM since 2011. He is also the founder and CEO of Novo Tellus Capital Partners, a private equity fund adviser. Mr. Loke has a Master’s degree in Business Administration from the University of Chicago and a Bachelor of Science degree in Electrical and Electronics Engineering from Lehigh University.</p> <p>Mr. Loke has over 25 years of experience in global technology management and investment. He has been working with the management team to strengthen AEM’s relationship with its key customer as well as provided leadership for the company’s acquisitions in 2017 and 2018. His previous working experience includes being a Managing Director and head of Baring Asia’s US office and co-head for Southeast Asia from 2000 to 2010; a Vice President at a venture capital fund H&amp;Q Asia Pacific from 1999 to 2000; a Senior Manager at AT Kearney from 1995 to 1999; and an R&amp;D engineer with Motorola from 1991 to 1993.</p>
Chok Yean Hung, 54	<p><b>Chief Executive Officer.</b> Mr. Chok has been with AEM since 2012. He has a Bachelor of Electrical &amp; Electronics Engineering degree from the National University of Singapore.</p> <p>Mr. Chok has more than 30 years of management and technical experience in the semiconductor industry. His previous working experience includes being part of the founding management team of Ellipsiz Test, EEMS Asia Pte. Ltd, and United Test and Assembly Center Pte. Ltd (UTAC); serving as Senior Vice President of Operations at EEMS, overseeing both the Singapore and Suzhou sites; the Vice President of Test Operation from 1998 to 2004, managing Memory IC and Mix Signal ICs Test’s manufacturing, engineering, and development; a Product and Test Engineer in Texas Instruments (S) Pte. Ltd in 1998 rising to a Product Engineering Manager and Senior Member of Technical Staff.</p>

Source: Company, DBS Bank

### Business Strategy

**R&D to keep up and grow with key customers in an expanded Total Addressable Market (TAM).** Over the last few years, AEM’s key customer has pushed into new markets organically and through acquisitions. In addition, technological advancements have enabled IoT, AI, and autonomous driving, among others, thereby expanding Intel’s TAM. As such, AEM is continuing to invest in R&D to develop customised test handling solutions for its key customers for their wafer, package, panel, and interconnected system level test needs.

**Expanding offerings in System Level Test and its value chain.** As new technology is being adopted, semiconductor manufacturers have to meet increasingly high demand. System Level Tests, which are more comprehensive, are becoming increasingly required in safety-critical markets such as automotive, industrial, and medical equipment. AEM is seeking to capitalise on this trend by enhancing its capabilities as well as tapping on various areas in the supply chain through M&A.

Report contributed by: CHUNG Wei Le

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**BUY** (>15% total return over the next 12 months for small caps, >10% for large caps)

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*\*Share price appreciation + dividends*

Completed Date: 29 Nov 2019 07:00:19 (SGT)

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