

**Applied Materials (AMAT)**

April 15th, 2018

Josh Zahn and Jeff Steers

Info Tech B

**Introduction**

Applied Materials (AMAT), the world's largest supplier of semiconductor fabrication tools, is a materials engineering company that provides manufacturing equipment, services, and software to the semiconductor, display, and related industries. Headquartered in Santa Clara, CA, AMAT can be broken down into three business segments (revenue): Semiconductor Systems (65%), Applied Global Services (21%), and Display and Adjacent Markets (13%). Broken down by region, their revenue comes from Asia Pacific (84%), The United States (10%), and Europe (6%). Within Asia Pacific, Korea, Taiwan, China, and Japan contribute to 94% of the revenue. The Semiconductor Systems segment develops, manufactures, and sells a wide range of manufacturing equipment used to fabricate semiconductor chips. The Global Services segment provides integrated solutions to optimize equipment and fab performance and productivity for semiconductor, display, and other products. The Display and Adjacent Markets segment produces products for manufacturing liquid crystal displays (LCDs), organic light-emitting diodes (OLEDs), and other display technologies for TVs, personal computers (PCs), electronic tablets, smart phones, and other consumer-oriented devices as well as equipment for processing flexible substrates.

Price (\$):	56.37	Beta:	1.57		<u>2016A</u>	<u>2017A</u>	<u>2018E</u>	<u>2019E</u>
Price Target (\$):	70.73	WACC:	8.3	Revenue (mil)	10,825	14,537	17,593	18,557
52 WK H-L (\$):	61.61-37.77	Current Ratio	3.14	% Growth	12.1	34.3	21	5.48
Market Cap (bil):	57.6	FCF/Share (%)	52.17	EBITDA	2,548	4,457	5,586	6,003
Float (mil):	1,044.60	EBIT/Int Exp:	19.54	EBITDA Margin	23.54	30.66	31.8	32.35
Short Interest (%):	1.31%	Debt/EBITDA (ttm):	1.24	EPS	1.56	3.2	3.41	4.46
Avg. Daily Vol (mil):	6.44	ROA (%)	20.21	P/Cash Flow	12.87	16.85	10.79	10.72
Dividend (\$):	.8	ROE (%)	41.46	P/E	18	17.42	12.69	12.10
Yield (%):	.73	ROIC (%)	28.58	EV/EBITDA	11.91	13.6	10.21	9.5

**Recommendation**

Applied Materials (AMAT) experienced an extremely successful 2017, growing revenues by 35%. This was driven by the need for data storage and processing, increasing screen size, Internet of Things, and a world that is increasingly moving digital. We expect this growth to continue as screen sizes will continue to grow as well as the need for a crisp, clear picture which AMAT products help supply. AMAT's Operating Margin also grew by 12% in 2017, which is in line with its steady growth over the past 5 years. This jump in growth can be attributed to their implementation of a collaborative cost savings strategy. We believe this will continue in the future and help AMAT grow their profitability and bottom line numbers. Not only does data need to be stored, but it also needs to be processed and AMAT's products help make that possible in a cost and energy efficient manner. It is estimated that by the year 2020, a city of one million people will produce 200 million gigabytes of data per day. This is a 269% increase from the current consumption of 54 million gigabytes a day. AMAT is poised to take advantage of this growth with their increasing R&D spending and their state of the art R&D facility located in the heart of Silicon Valley. Of the \$1.8 billion dollars of R&D spending, half is allocated towards updating and improving their existing products and the other half is allocated towards new products and innovations that will be used in the future. AMAT also has very strong financials, very few current liabilities and an ample amount of cash flow. In a volatile industry, having an excess supply of cash is key for the success of the company. As industry trend moves from 2D NAND to 3D NAND, AMAT's Semiconductor Systems segment is ready to capitalize on the opportunity. 2D NAND is currently being used in solid state drives (SSD's) for computers. An SSD is a much faster and efficient form of a hard drive and is where the computer industry is headed. An upgrade

from 2D NAND to 3D NAND gives computers significantly more storage capability along with the speed. In the Display and Adjacent Markets segment, tremendous opportunity exists as TV screens will eventually evolve from LED to OLED screens. Unlike LED, OLED screens can be made extremely thin, flexible, and remarkably small. They also have a faster response time and use significantly less power. These are key drivers for the future as electronics have been moving towards thinner screens that emit a clearer picture requiring less power. Also, OLED will be the screens used in bendable smartphones and TV's which will have a huge impact on revenue for the Display segment. Once the price-point for OLED screens drops, more and more consumers will begin to switch from appliances with LED screens to one's with OLED screens. With more semiconductors needed than ever before and AI/Big Data waiting to take off, we believe Applied Materials is a strong buy.

### Investment Thesis

**Semiconductor Systems:** Wafer Fabrication Equipment (Semiconductor Systems) is the largest business segment for AMAT and the market is projected to increase from \$32 billion in 2017 to \$45 billion in 2018, a 41% increase in one year. The increase in demand will result in larger revenues for the semiconductors systems segment of AMAT, where they have over 25% of the market share.

**AI/Big Data:** The big data market is projected to increase from \$41 billion in 2018 to \$89 billion in 2025, a 117% increase during that time. Meanwhile, the Artificial Intelligence(AI) market is projected to increase from \$8 billion in 2018 to \$90 billion in 2025, a 1025% increase during that time. AMAT will benefit directly from these emerging sectors, as the need for silicon will greatly increase, as it's vital to the creation of AI and big data servers.

**Display:** Display is the fastest growing business segment for AMAT, as revenues increased from \$700 million in 2013 to \$1.9 billion in 2017, a 171% increase in only 4 years. The company's served market is currently at 15% and is expected to reach 40% by 2020, a 167% increase in a 3-year span. The capitalization on emerging OLED technology combined with the display equipment market rising from \$8 billion in 2015 to \$18 billion in 2018 will drive the growth of AMAT's display business segment

**Research and Development:** In 2017, AMAT invested \$1.8 billion in R&D, the largest within the industry and over 30% of the entire AMAT team is dedicated exclusively to research and development. The Maydan Technology Center, which is a billion-dollar facility, is widely considered as the most advanced technology research lab in the world, with over \$100 million reinvested each year and over 500 engineers working 24/7 alongside customers to bring new innovations to life. Being the leader in innovation within the industry has resulted in AMAT having the largest IP portfolio, with nearly 12,000 patents.

### Valuation

To reach an intrinsic value for AMAT, two separate valuations were used. The first being a five-year free cash flow to the firm model. Using a terminal growth of 2.0% and a WACC of 9.16% we arrived at an intrinsic value of \$78.79. To compensate for the recent success of AMAT, we imputed a momentum premium of 1.5% into the cost of equity. Additionally, an EV/EBITDA multiple valuation was conducted using 2018 EBITDA of 4,961 mil and peer comparable multiple of 12.6x, resulting in a valuation of 66.38. The multiple showed AMAT is trading at a discount which leads us to believe there is room to grow. Weighting the two valuation models 65/35 favoring the EV/EBITDA model, a price target of \$70.73 was reached, resulting in a 24.36% upside. We used this split because revenues can vary significantly in the semiconductor industry which could lead to an inaccurate FCF model. The EV/EBITDA model gives us more consistency and less volatility in our valuation.

## Risks

**High Capital Intensity:** The majority of Applied Materials' innovation processes require a large amount of capital intensity, which results in a high fixed cost structure. Because of this, margins have the potential to greatly suffer when sales fall. Also, AMAT is forced to consistently spend a considerable amount on R&D to maintain a competitive edge within the industry, which increases the company's expenses considerably.

**Largely Exposed to Semiconductor Industry:** Applied Materials' largest business segment is Semiconductor Systems, which make up about 65% of the company's revenue. Because of this exposure to the semiconductor industry, the revenue of AMAT is largely dependent on the overall industry and if the industry suffers a setback, AMAT's share price will be negatively affected.

**Changes in Technology:** Technology, especially within the semiconductor industry, is constantly changing and because of that AMAT is forced to develop new products and disruptive technologies, improve and advance new applications for existing products and adapt products for use by customers in different applications and markets with varying technical requirements.

**Smartphone Demand:** A significant percentage of AMAT's business is with screen related production. A large portion of these screens are used in cellular devices and if smartphone demand changes, so could the revenues coming from their screen portion of business.

## Management and Compensation

Gary E. Dickerson (60) was appointed as CEO and a member of the Board of Directors in September 2013. Prior to his time at Applied Materials, Mr. Dickerson spent time at competitors Varian and KLA-Tencor where he held various positions. He has over 30 years of experience in the Semiconductor industry. Mr. Dickerson is heavily compensated via variable and long-term incentives. In 2017, 93% of his salary was comprised of variable elements with 75% of it consisting of equity with multi-year vesting.

## Stock Price Graph



## Peer Analysis

<i>Name</i>	<i>Ticker</i>	<i>Market Cap (billion)</i>	<i>Revenue (billion)</i>	<i>EBITDA (billion)</i>	<i>Free Cash Flow (billion)</i>	<i>P/E</i>
<b>Applied Materials</b>	<b>AMAT</b>	<b>57.6</b>	<b>14.54</b>	<b>4.28</b>	<b>3.26</b>	<b>14.9</b>
ASML Holding	ASML	71.4	9.05	2.91	1.48	33.58
LAM Research	LRCX	32.6	8.01	2.21	1.87	15.15
KLA-Tencor	KLAC	17	3.48	1.33	1.04	15.45
<i>Industry Average</i>		<i>5.72</i>	<i>2.03</i>	<i>.56</i>	<i>.26</i>	<i>17.27</i>
<i>Peer Average</i>		<i>40.33</i>	<i>6.84</i>	<i>2.15</i>	<i>1.46</i>	<i>21.39</i>

The Peer Group consists of three companies within the semiconductor industry each of a varying size. We believed this was the most accurate peer group given the volatility of their industry. Aside from the ratios above, AMAT has strong financials compared with their peer group. Specifically, AMAT has significantly more cash which is important to have to stay on the leading edge of innovation. In 2017, Applied led their peer group in R&D expenditures by over 33%.

### Ownership

% of Shares Held by All Insider Owners:	0.58%
% of Shares held by Institutional & Mutual Fund Owners:	99.42%

### Top 5 Shareholders

Holder	Shares	% Out
Vanguard Group	76,833,094	7.32
Blackrock	68,889,949	6.56
State Street Corp	53,024,372	5.05
Laurene Powell Jobs Trust	25,442,956	2.42
State Farm Mutual	20,335,346	1.94