

## Advanced Micro Devices (Ticker: AMD US)

Advanced Micro Devices	
Ticker MyBolsa/website BiG	AMD
Ticker BiGlobal Trade	AMD
Ticker BiGTrader24	AMD
Ticker BiG Power Trade	AMD
P/E Ratio 2019E	51.49
P/BV Ratio	19.88
EV/EBITDA	4.55

Source: BiG Research

Price and Performance (Values in USD)	
Price	32.85
52 Week High	34.86
52 Week Low	15.72
YTD	78.0%
Average Daily Volume	72,320,880
Market Cap (mn)	35,531
Beta	1.65
Dividend	0.00
EPS	0.34

Source: BiG Research

Consensus (last 5m)	
Buy	16
Hold	17
Sell	5

Source: BiG Research

Financial Information	
Sales (USD mn)	6,475
EBITDA (USD mn)	621
Nº of Employees	10,100
ROA	6.3%
ROE	21.7%

Source: BiG Research

### Notes:

All quotes were updated on July 23, 2019 at 09h42.

### Relevant Information:

Use the following link to view our most recent publications:

<https://www.big.pt/InformacaoMercados/TradingIdeas/Index/-1>

Use the following link to see our recommendation history:

<https://www.big.pt/pdf/Newsletters/nld.pdf>

### Description

Advanced Micro Devices produces semiconductors for global clients. The portfolio of products offered by AMD include processors and chipsets for PCs, discrete graphics processing units (GPU) and professional graphics (included in the Computing and Graphics segment) and server and embedded processors, semi-custom System-on-Chip (SoC) products, development services and technology for game consoles (included in the Enterprise, Embedded and Semi-Custom segment). The Computing and Graphics segment accounted for 57% of 2017Y revenues, with the remaining 43% were accounted for the Enterprise, Embedded and Semi-Custom segment. The company processors compete with Intel products and its GPUs compete with NVIDIA's.

Created in 1969, it began trading in the NASDAQ exchange in 1972 and has a current market capitalization of USD 35.5 bn.

### Investment Thesis

**Intel weakness is AMD gain:** Intel has consecutively delayed the launch of 10 nanometre (nm) chips, with the newest launch date in the 2nd half of 2019. This delay has created the opportunity for AMD to over-innovate Intel, launching its 7 nm chips (a substitute of Intel's 10 nm) this year. The comparatively more advanced chip launches of AMD allow the company to capitalize on Intel's delays by capturing market share in the PC market.

**Gaming Industry Exposure:** Gaming is a USD 100 bn industry, and it continues to grow. While NVIDIA is the leader of GPU's for Gaming, AMD has also experienced growth in the graphics unit due to the increased popularity of gaming (and consequent demand for graphics).

**Increase in market share in datacenters:** Intel dominates the market of processors for datacenters. However, AMD (along with other competitors) are nipping at Intel's dominance, developing products for this segment. This is a growing industry and should support revenue growth for semiconductor sector as a whole.

**Ambitious Goals:** AMD has presented to the market an ambitious strategic model, supported by the portfolio of new products of the company. The strategic plan includes not only revenue growth, but also margin expansions, with AMD focusing on increasing sale prices of its products (in the past it was often seen as a 'cheaper' option to Intel and NVIDIA products, which penalized margins).

### Environmental, Social and Governance (ESG)

**Environment:** In 2018, the company used 129 GWh of electricity, 200 mn liters of water and approximately 2488 metric tons of CO2. In 2018 generated around 651 metric tonnes of waste.

**Social:** Employees did on average 1h of voluntary work in 2017.

**Governance:** The company only has 24% of women in its employees. Employee turnover is only 8%.

### Analyst:

João Calado, CFA

### Research:

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Income Statement (USD mn)	2016	2017	2018
Revenues	4319	5253	6475
Cost of sales	3316	3466	4028
Research & Development	1008	1196	1434
Marketing and sales	466	516	562
Other	-98	-52	0
<b>Operational Costs</b>	<b>4692</b>	<b>5126</b>	<b>6024</b>
EBIT	-373	127	451
Financial costs	156	126	121
Other expenses (gains)	-80	9	0
EBT	-449	-8	330
Taxes	39	18	-9
Others	10	7	2
<b>Net Income</b>	<b>-498</b>	<b>-33</b>	<b>337</b>
EPS	-0.6	-0.03	0.34

Source: Company Info; BiG Research

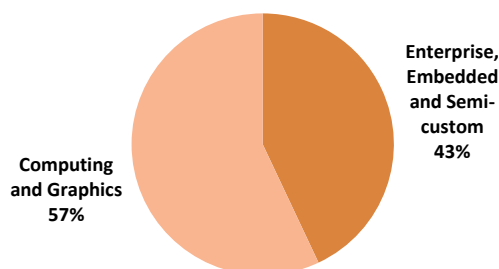
### Income Statement

AMD had 5 consecutive years of losses between 2012 and 2016, and was only able to break that in the past fiscal year, due to improving margins. The computing and graphics segment saw an increase of 54% YoY in revenues (to USD 3 bn) benefiting from the launch of more than 40 new CPUs and GPUs which improved AMD's pricing power. The Enterprise, Embedded, and Semi-Custom segment reported a flat annual revenue growth (revenues at USD 2.3bn), notwithstanding AMD re-entering the datacentre market through the launch of EPYC processor platforms. Gross margins grew from 23% to 34% in 2017, benefiting from a more favourable product mix and the removal of a charge of USD 340 mn (one was recorded in 2016).

Free Cash Flow (USD mn)	2016	2017	2018
Operational CF	81	12	34
Net Income	-498	-33	337
Depreciation & Amortization	133	144	170
Stock-based compensation	86	97	137
Net working capital	172	-244	-727
Others	188	48	117
Investment CF	277	-54	-170
Property, plant and machinery	-77	-113	-163
Financial investments	342	1	-78
Sale of client receivables	10	60	71
Others	2	-2	0
Financial CF	122	-33	28
Debt changes	-1343	-40	-41
Shares	687	20	70
Convertibles	782	0	0
Others	-4	-13	-1
Change in FCF	480	-75	-108
Final Cash & Equivalents	1266	1191	1083

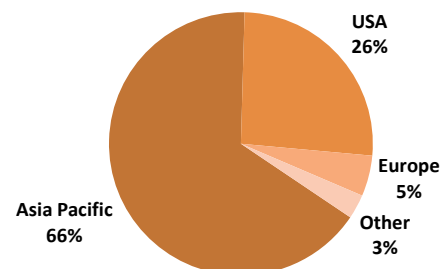
Source: Company Info; BiG Research

### Revenues by segment



Source: Company data

### Revenues by geography



Source: Company data

Balance Sheet (USD mn)	2017	2018
<b>Assets</b>	<b>3552</b>	<b>4556</b>
Cash & Equivalents	1185	1156
Receivables & customer fin	454	1235
Property Plant & Equipment	261	348
Inventories	694	845
Intangible Assets & Goodwill	289	289
Other Assets	669	683
<b>Liabilities</b>	<b>2956</b>	<b>3290</b>
Short term Debt	70	136
Long term Debt	1325	1114
Payables	796	1061
Accrued liabilities	555	763
Other liabilities	210	216
<b>Total Shareowner's Equity</b>	<b>596</b>	<b>1266</b>
<b>Total Equity and Liabilities</b>	<b>3552</b>	<b>4556</b>

Source: Company Info; BiG Research;

### Earnings

AMD reported 1<sup>st</sup> quarter revenues of USD 1.27bn in line with estimates and EPS of USD 0.06 vs est. USD 0.05. The revenues dropped 23% yoy as the Computing and Graphics segment sales declined. The revenue from Ryzen and EPYC processor and datacenter GPU more than doubled yoy. Revenues from Computing and Graphic segment declined as higher client processor sales were offset by lower Graphics sales.

In the 2<sup>nd</sup> quarter the company anticipates revenues of USD 1.47bn to USD 1.57 bn.

For 2019, the company expects to increase by 30% its Ryzen systems and by 50% the Ryzen notebooks. According to its guidance, revenues should rise by a high single digit and gross margin should achieve more than 41%. It expects its Free Cash Flow to be positive.

### Corporate Governance

**Lisa Su (CEO):** AMD has 12 member executive team (10 men, 2 women), led by Lisa Su. Su's career in AMD began in 2012 as senior vice president and general manager in charge of global business units, and her appointment to CEO occurred in October 2014. Her total compensation in 2017 reached USD 10,9 mn, of which 925 th was the base salary and the remaining 10 mn were mostly stock awards. The chairman of AMD is John E. Caldwell.



Source: AMD

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## ▲ Main products

### CPU (Central processing unit):



AMD Ryzen Threadripper. Source: AMD



AMD Ryzen 9. Source: AMD

- **Threadripper:** In October 2018 launched the 2<sup>nd</sup> generation of AMD Ryzen Threadripper: While the WX series focus is on users that require high computational power for heavy workloads, the X series is for gamers and streamers high performance and smooth games.

Name	Cores/Threads	Cache	Clock	Price USD
Ryzen Threadripper 2990WX	32/64	80MB	4.2GHz	1799
Ryzen Threadripper 2970WX	24/48	76MB	4.2GHz	1299
Ryzen Threadripper 2950X	16/32	40MB	4.4GHz	899
Ryzen Threadripper 2920X	12/24	38MB	4.3GHz	649

- **7nm:** In July 7<sup>th</sup> of 2019 it launched the Ryzen 3000 CPUs (7nm), examples:

Name	Cores/Threads	Cache	Clock	Price USD
Ryzen 9 3900X	12/24	70MB	4.6GHz	499
Ryzen 7 3700X	8/16	36MB	4.4GHz	329
Ryzen 5 3600	6/12	35MB	4.2GHz	199
Ryzen 3 3200G	4/4	6MB	4GHz	99

In September is expected to launch the Ryzen 9 3950X with 16 cores and 32 threads.

- **Laptops:** These are less powerful CPUs focused on saving energy in order to increase the battery capacity of laptops and mobile devices:

Name	Cores/Threads	Cache	Clock	Price USD
AMD Ryzen™ 7 3750H	4/8	6MB	4GHz	n.a.
AMD Ryzen™ 5 3550H	4/8	6MB	3.7GHz	n.a.
AMD Ryzen™ 3 3300U	4/4	6MB	3.5GHz	n.a.

- **Servers:**

Name	Cores/Threads	Cache	Clock	Price USD
AMD EPYC™ 7601	32/64	64MB	3.2GHz	4700
AMD EPYC™ 7551P	32/64	64MB	3GHz	3650
AMD EPYC™ 7451	24/48	64MB	3.2GHz	2450



AMD EPYC 7000 series. Source: AMD

### Recent and possible future launches:

Year	2017	2018	2019	2020	2021?
Architecture	Zen (1)	Zen (1) / Zen+	Zen (2)	Zen (3)	Zen (4)
Process Node	14nm	14nm / 12nm	7nm	7nm+	5nm?
Servers	EPYC 'Naples'	EPYC 'Naples'	EPYC 'Rome'	EPYC 'Milan'	EPYC 'Next-Gen'
Max Cores / Threads	32/64	32/64	64/128?		
Ultimate performance CPUs	Ryzen Threadripper 1000 Series	Ryzen Threadripper 2000 Series	Ryzen Threadripper 3000 Series	Ryzen Threadripper 4000 Series	Ryzen Threadripper 5000 Series
Max Cores / Threads	16/32	32/64	64/128?		
Desktops	Ryzen 1000 Series	Ryzen 2000 Series	Ryzen 3000 Series	Ryzen 4000 Series	Ryzen 5000 Series
Max Cores / Threads	8/16	8/16	16/32		

### GPU (Graphics processing unit):

- In July 7<sup>th</sup> of 2019 launched Radeon RX 5700 graphic cards.
- In February 2019, the Radeon VII, the first based on 7nm, was launched.

Name	Compute units	ROPs	Stream processors	Boost Frequency	Max memory size	Memory type	Price USD
Radeon™ VII	60	n.a.	3840	Up to 1750 MHz	16GB	HBM2	699
Radeon™ RX 5700 XT	40	64	2560	Up to 1905 MHz	8GB	GDDR6	399
Radeon™ RX 5700	36	64	2304	Up to 1725 MHz	8GB	GDDR6	349
Radeon™ RX Vega 64	64	64	4096	Up to 1546 MHz	8GB	HBM2	663
Radeon™ RX Vega 56	56	64	3584	Up to 1471 MHz	8GB	HBM2	399
Radeon™ RX 590	36	32	2304	Up to 1545 MHz	8GB	GDDR5	279
Radeon™ RX 580 (OEM)	36	32	2304	1266-1340 MHz	8GB	GDDR5	225

The 7nm Navi GPUs should be launched in the 3Q19.



AMD Radeon RX 5700 XT. Source: AMD

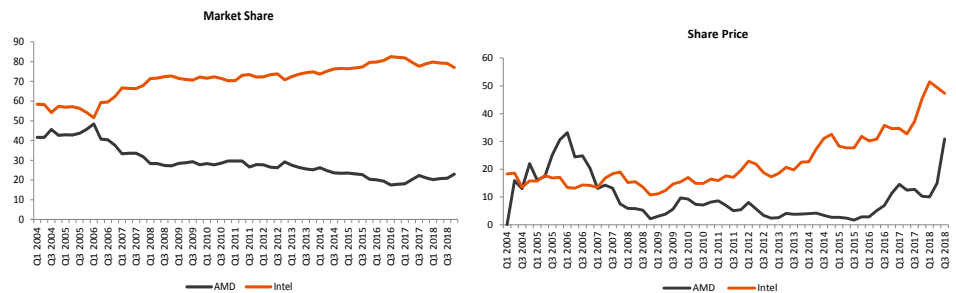
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**Risks**

**This time is different:** AMD has always been a smaller player in the semiconductor space (vs. the leader Intel). Thus the goal of capturing market share from Intel has also always been present, with varying degrees of efficacy, as Intel enjoys the protection of strong barriers of entry. As most of the gains of AMD’s stock this year are due to the expectations of market share gains, with consequent positive effect in the long run earnings growth, if the company disappoints those expectations (which are quite high as seen by AMD’s multiple premium), the stock could experience a strong correction.



Source: CPUBenchmark. Includes only x86 processors.

**Cryptocurrency:** AMD graphics are used to mine cryptocurrencies. In the height of the crypto prices boom, demand for the graphics was high, and this had a positive effect in the company revenues - in the 2<sup>nd</sup> quarter 2018 cryptocurrency mining accounted for 30% of the 100% YoY growth in graphics revenues. However, and as cryptocurrencies boom is increasingly a bust, demand for graphics has been greatly reduced with equal effect on revenue from this segment – AMD has already cautioned that effect of cryptocurrency mining chips will be negligible from the current quarter onwards. Thus the company loses one important growth vector to sustain the high expectations of earnings growth embedded in its multiples valuation.

**Cyclicality of the Semiconductor Industry:** The semiconductor industry is very cyclical, a factor which has benefited the sector in the past years, as the economic cycle has been positive. However in the event of an economic slowdown, semiconductors are one of the negatively impacted sectors. While the risk is experienced by the sector as a whole, AMD ‘expensive’ multiples exacerbate this risk for the company.

**Trade Wars:** Semiconductors generate a significant part of their revenues from Asia, with the Chinese market being one of the principal markets in that area. In AMD’s case China accounts for the largest share of revenues at around 33%. Thus the US and China trade war represents a risk for the semiconductors, which could be caught in the ‘crossfire’ as a means for China to retaliate against the US. Moreover a trade war exacerbates the risks of an economic slowdown, which also is negative for the sector. This risk is shared by the sector as a whole.

**Slowdown in PC sales:** After reaching its peak in 2011, sales of personal computers began declining in the past years. This decline negatively affects AMD by reducing demand for its processors. While the slowdown isn’t occurring as fast, and in 2018 sales have actually increased, PC sales have long stopped being the growth driver of revenues for semiconductors – hence their pivot to other revenue generating segments such as gaming and processors for server computers in datacenters.

Credit Ratings		
Agency	Rating	Outlook
S&P	BB-	POS
Moody's	Ba3	STABLE

Source: Company data

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**Comparative Analysis**

Name	Market cap (mn)	Currency	P/E 2019E	EV/EBITDA	YTD	EBITDA Margin
MICRON TECHNOLOGY INC	52,088	USD	7.6	2.1	49%	60.8
INTEL CORP	229,894	USD	12.0	7.7	9%	46.2
NVIDIA CORP	104,334	USD	32.2	31.6	28%	30.5
STMICROELECTRONICS NV	15,595	EUR	17.6	5.7	37%	23.7
ASML HOLDING NV	88,048	EUR	33.8	27.3	51%	27.0
ADVANCED MICRO DEVICES	35,531	USD	51.5	46.8	78%	9.7
Average exc. AMD			20.6	14.9	35%	37.6

Source: BIG Research

In the semiconductor sector AMD has the most expensive multiples profile. While the company has been able to improve operational performance in the past years (it reached positive EPS last fiscal year), its EBITDA margin still trails peers. We currently identify the ‘expensive’ nature of AMD’s stock as the main risk, as it exacerbates the potential of a strong correction in the event of the company not reaching expectations – which by the multiples that it trades can only be classified as high.

**Graph**



Source: BiGlobalTrade; BiG Research

**Upcoming Events**

**24<sup>th</sup> July, 2019: 2<sup>nd</sup> quarter results**

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- Clarification of the qualitative terms implied in the recommendations:
  - Buy, expected absolute return above 15%;
  - Accumulate, expected absolute return between +5% and +15%;
  - Keep/Neutral, expected absolute return between -5% and +5%;
  - Reduce, expected absolute return between -5% and -15%;
  - Sell, expected absolute return below -15%;The investment framework aforementioned is merely indicative and not globally strict.
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- The update of the investment recommendations models and respective price-targets will occur, usually, in a period of 6 to 12 months.
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