



End Session

- Home
- Companies
- Funds
- ETFs
- Markets
- Articles & Videos
- Portfolio
- Help & Education
- Newsletters
- Enter a Ticker or Name

Intel Corp INTC |

PDF Report

- Quote
- Chart
- Stock Analysis**
- Performance
- Key Ratios
- Financials
- Valuation
- Insiders
- Shareholders
- Transcripts
- Filings
- Bonds
- Options

Analyst Research Analyst Report Archive Top Rated Stocks in Sector

Intel Delivers a Monster Second Quarter Led by the Data Center Group; Raising Fair Value to \$65



by
Abhinav Davuluri
 Senior Equity Analyst

Analyst Note 08/08/2018

Intel held its Data-Centric Innovation Summit on Aug. 8, during which management highlighted the chip titan's numerous efforts in the data center. The presentations validated our confidence in our investment thesis for wide-moat Intel, as the shares continue to trade at an attractive discount to our unchanged \$65 fair value estimate.

Authors can be reached at [Analyst Feedback](#)

Morningstar's [Editorial Policies](#)

One of the key takeaways, in our view, was that 50% of the Xeon server processors sold to the 10 major cloud service providers in 2017 were custom-designed for the individual customer, up from 18% in 2013. We think Intel's increasingly deeper and more intimate relationship with cloud service providers to help them optimize workloads will make it difficult for competitors such as Advanced Micro Devices to capture meaningful server CPU share, at least in the growing cloud environment. On the artificial intelligence front, Intel captured \$1 billion in AI-related Xeon data center revenue in 2017, as we note the flexibility of its Xeon products to effectively run both AI and non-AI workloads is highly appealing to major cloud service providers. Consequently, we maintain our view that Intel will be a formidable force in both the data center and AI semiconductor markets for the foreseeable future, despite recent market enthusiasm for Nvidia, Xilinx, and AMD traction.

Business Strategy and Outlook 01/25/2018

Intel is the leader in the integrated design and manufacturing of microprocessors found in personal computers. With the rise in interconnectivity of devices ranging from PCs to smartphones, Intel strives to provide the most powerful and energy-efficient silicon solution to any product "smart and connected." The data centers used to facilitate the information stored, analyzed, and accessed by various front-end devices are mostly run with Intel server chips.

Intel differentiates itself first and foremost via the continued execution of Moore's law, which predicts transistor density on integrated circuits will double about every two years, meaning subsequent chips have substantial power, cost, and size improvements. This scaling advantage is perpetuated through higher-than-peer-average R&D and capital expenditure budget that allows it to control the entire design and manufacturing process in an industry where the majority of competition focuses on only one phase.

As cloud computing continues to garner significant investment, Intel's data center group will be an indirect beneficiary. Mobile devices have become the preferred device to perform computing tasks and access data via cloud infrastructures that require considerable server build-outs. This development has provided strong tailwinds for Intel's lucrative server processor business. We believe the Altera acquisition will help Intel maintain its recent growth trajectory in the space, as customers increasingly seek out customized server solutions that use field-programmable gate array chips.

Bulls Say

- Intel is one of the largest semiconductor companies in the world and holds the lion's share of the PC and server processor markets. The firm has sustained its position at the forefront of technology by investing heavily in R&D, and this trend should continue.
- Intel has made a string of savvy acquisitions to build its Artificial Intelligence and automotive offerings, including Altera, Mobileye, Nervana, and Movidius.
- The data center group has indirectly benefited from the proliferation of mobile devices. Server processor sales will be the main driver of growth in the near future.

Bears Say

- Intel is facing a PC market in secular decline and must successfully maintain its technology lead to prevent market share loss to AMD.
- The inability for Intel to break into the smartphone market at a reasonable level is cause for concern, as mobile devices continue to proliferate at the expense of PCs.
- The rise of alternative solutions in the data center is cause for concern, with Nvidia's GPUs being leveraged to accelerate server workloads.

Competitors INTC

More...

Name	Price	% Chg	TTM Sales \$ mil
Intel Corp	\$44.84	-0.12	66,230
Taiwan Semiconductor Manufacturing Co Ltd ADR	\$43.93	-1.39	32,815
Qualcomm Inc	\$72.10	-0.57	22,832
Broadcom Inc	\$229.45	-1.33	19,648
Texas Instruments Inc	\$104.27	-1.67	15,672
NVIDIA Corp	\$267.81	-1.83	11,877

The proliferation of mobile devices has come at the expense of the mature PC market, Intel's historic stronghold, with ARM and its cohorts replacing AMD as chief rival. The rise of artificial intelligence has also unleashed a new competitor in Nvidia for specialized chips to accelerate AI-related workloads. Consequently, Intel has built a broad accelerator portfolio via the acquisition of Altera for FPGAs, Mobileye for computer vision chips used in cars, Nervana neural processors, and Movidius video processing units. By 2021, we project the AI accelerator chip market to be \$20 billion, with Intel being a direct beneficiary.

Economic Moat 01/25/2018

We believe Intel's wide moat emanates from its superior cost advantages realized in the design and manufacturing of its cutting-edge microprocessors. This in-house capability supports a streamlined supply chain, shorter time to market, and the ability to scale promising products more rapidly. Semiconductor manufacturing is inherently capital-intensive and thus requires methodical planning and execution to keep the cost per chip at a reasonable level. Intel accomplishes this through investments in the latest process equipment technologies. However, in order for the economics of the business to be pragmatic, there needs to be strong demand via differentiated products that can be sold at high margins and sufficient volumes, which Intel achieves with its massive research and development budget that averaged \$12.65 billion annually from 2015 to 2017.

Following along the pathway prescribed by Moore's law, coined by one of Intel's chief founders Gordon Moore, the number of transistors per unit area doubles approximately every two years. As process technologies develop, the cost per unit area increases while the unit area per transistor decreases. Thus, by netting these two trends, Intel is able to decrease the cost per transistor with each successive technology node. This fundamental realization is at the core of Intel's one- to two-year lead over the rest of the chip industry. Intel's moat is encapsulated in its "tick-tock" strategy, in which the firm advances its technology node every two years (the tick), while it launches a new architecture for its microprocessors during the years in between (the tock). However, in recent years the combination of the secular PC decline and process development challenges have led Intel to adopt a "tick-tock-tock" strategy. In this variation, Intel similarly shrinks its process node in the first year, then spends the subsequent two years optimizing the architecture. We believe this is a sound strategy because server chips tend to lag the initial "tick." As a secondary moat source, we view the firm's engineering know-how related to advanced processor design and process technologies as an intangible asset not easily replicated by peers.

Server processors are manufactured with the same technology and many identical process steps as chips designated for PCs. Therefore, we believe that as the product mix offered by Intel shifts from mostly PC chips to predominantly server chips, there effectively won't be the need to overhaul any portion of wafer fabrication equipment. Generally, server processors favor performance over power efficiency, which we believe is Intel's forte and justifies its strong presence in the market. However, different classes of data centers have separate needs, and the potential for ARM-based server chips making a push into low-power servers is a plausible scenario. We see the lessons learned by Intel in mobile carrying over to servers, as its Atom server chips for low-power are more energy efficient than predecessors.

With Intel exiting the mobile application processor market in 2016, we believe the firm will be able to better allocate its resources. Intel has been building its wireless connectivity portfolio with multiple acquisitions to give it in-house Wi-Fi, Bluetooth, GPS, and near field communication technologies. The logic behind this strategy is to combine these components on an LTE modem chipset to provide a different way for Intel to break into a tier-one smartphone, such as Apple's iPhone, which Intel ultimately did in 2016 for certain iPhone 7 models. These investments have the potential to make an impact not only in mobile, but also in adjacent products ranging from 2-in-1 PCs (notebooks with PC and tablet functionality) to the Internet of Things. Although these developments don't move the needle for us just yet, we believe Intel is making a step in the right direction to establishing its presence in the mobile space.

Furthermore, the x86 ecosystem (in which Intel's core products coexist), is representative in the majority of PC and server chips. Network effects have played a big role in its dominance, as proprietary computer software has been written specifically for the x86 architecture, leading to significant switching costs to shift architectures. The growth in the PC market allowed Intel to invest heavily in R&D to fuel continued progress in the x86 architecture. However, with the PC market stagnating and ARM architecture exhibiting a commanding lead in mobile devices, x86 has continued to flourish in server processors. ARM has sought to enter the server market by way of servers tailored for energy efficiency, which results in a smaller footprint and lower total cost of ownership relative to traditional servers. Intel's processors are incumbent in the lion's share of servers, and we believe the x86 ecosystem coupled with the newer server CPU variants developed with 14-nanometer technology will thwart offerings by ARM.

Intel has also pursued adjacent markets to leverage its scale and resources, via both organic and inorganic methods. The firm has developed non-volatile memory solutions with Micron via a joint venture, including 3D NAND and 3D XPoint products. Meanwhile, Intel has made a flurry of acquisitions in recent years, including Altera in 2015 for FPGAs, Nervana and Movidius in 2016 for Artificial Intelligence-related chips, and Mobileye in 2017 for computer vision chips for cars. Each of these auxiliary businesses remain small relative to Intel's PC and data center groups. Nonetheless, each growth vector bears watching as we contemplate Intel's economic moat in the future.

We are most positive on Intel's acquisition of Mobileye, which sells computer vision processors, dubbed EyeQ, into production vehicles for basic functions such as advanced driver assistance systems. At the end of 2017, Mobileye's solutions could be found in 24 million cars on the road. Ingrained in the firm's strategy is developing scalable solutions, with its future EyeQ processors poised to incrementally approach Level 5 autonomy, with Intel's help. We believe Intel-Mobileye is well-suited to capitalize on the autonomous driving opportunity, given its strategy for scalability and real-time map development. Ultimately, meaningful penetration into the automotive market would be a net positive for Intel's moat, based on intangible assets and switching costs.

Fair Value and Profit Drivers 07/27/2018

We are raising our fair value estimate to \$65 per share from \$62. Our fair value implies a forward GAAP P/E ratio of 15 times. As the PC market continues to decline, we see server processors supplanting sales in PC processors, ultimately leading to overall revenue growth in the mid-single digits through 2022. In the near term, we see Intel's PC-derived revenue declining in the low single digits. However, the proliferation of cloud computing and burgeoning Big Data and artificial intelligence trends will provide tailwinds for the data center group, which we see growing at an 11% CAGR through 2022. By then, we believe the PC and data center groups will converge in percentage of total revenue, with both accounting for roughly 40% each. The firm's auxiliary businesses (Internet of Things, nonvolatile memory, programmable solutions [formerly Altera], and automotive [formerly Mobileye]) will also drive growth going forward, though these subsegments remain a small portion of total revenue at this juncture. Beyond our explicit five-year horizon, we foresee the automotive segment spearheading revenue growth. Mobileye's incumbency in countless advanced driver assistance systems programs and robust pipeline of design wins, coupled with Intel's technological and financial resources give us confidence Intel will be a formidable player in the race to self-driving cars. We estimate a \$7 billion 2025 opportunity for Intel and Nvidia's autonomous platform solutions and estimate both entities will capture meaningful portions of this opportunity (\$3.7 billion for Intel and \$3.3 billion for Nvidia in self-driving platform revenue). Intel's lead in process technology benefits from sizable R&D expenses (21% of revenue on average in recent years), which is critical to the firm's ability to sustain its advantage. Going forward, we believe increasing unit sales of server chips, which as a segment have above-corporate-average gross margins, will partially offset greater costs associated with cutting-edge process technologies. The firm's foray into 3-D NAND manufacturing to support its SSD business for servers, however, will depress gross

margins. Consequently, we see gross margins tracking around 62% over the next few years. Nonetheless, we think the firm can drive operating leverage with more-focused research and development spending toward data center and automotive end markets, while shifting resources away from the declining PC space, leading to operating margins in the low 30s.

Risk and Uncertainty 01/25/2018

The cyclical industry in which Intel operates will cause its profitability to fluctuate regardless of how successful it is in tailoring its processors to new markets. Our uncertainty rating is medium and reflects the underlying risk faced by Intel regarding the proliferation of mobile devices at the expense of PCs, the expanding role of server processors in its product mix, and the advancement of technology nodes to 10-nanometer, 7-nanometer, and so on. In the PC space, any misstep by Intel could lead to AMD capturing market share. While it is more likely that ARM-based processors could begin to steal server market share from Intel, it is also theoretically possible ARM processing power catches up to Intel core processors. Any prolonged delay in process technology by Intel would allow other semiconductor manufacturers to quell Intel's lead and offer processors at the same node as Intel or even surpass it. Recent achievements by Taiwan Semiconductor and Samsung seem to have turned this possibility into a reality, with the two foundries reaching the 10-nanometer node (in high volume capacity) in 2017, while Intel pushed out its 10-nanometer products to 2018. We note that not all processes are created equally, however, with nomenclatures serving as marketing terms over precise dimensions.

Stewardship 01/26/2018

We view Intel's stewardship of shareholder capital as Standard. Brian Krzanich took over as CEO in May 2013 following the retirement of Paul Otellini. Krzanich was previously COO and has been with the firm since 1982. Before becoming COO in January 2012, he held leadership positions in Intel's manufacturing organization. Robert Swan is the latest CFO for Intel, following a stint with private equity firm General Atlantic, as well as CFO roles at eBay, Electronic Data Systems, and TRW. Swan took over for Stacy Smith, who served as CFO from 2007 to 2016. Smith joined Intel in 1988 and has held various positions at the company, including finance, information technology, and sales and marketing roles. Smith took on a broader role within Intel leading manufacturing, sales, and operations, but will be retiring from Intel at the end of January 2018. Former CFO Andy Bryant remains at Intel and is now chairman of the board. We consider the firm to have a deep management bench.

Management has made the right moves to allow Intel to maintain its dominant position in computer processors in recent years, but the success of the firm's recent forays into new markets is still up for debate. Intel had been making a concerted effort to break into smartphone and tablet processors, which is the stronghold of ARM-based processors, with its Atom chips, and even paid \$1.4 billion to acquire Infineon's wireless connectivity chip business in 2011 to support the endeavor. In 2016, however, the firm seemingly ended its mobile pursuits, at least with respect to application processors. In addition, Intel acquired antivirus and security software maker McAfee for \$6.7 billion (net of cash) in 2011, with the vision of adding security features to its chips and hardware, which when integrated with software will provide more effective security solutions. Although strategically sound, it appears that Intel was unsuccessful in executing its vision for McAfee, having spun off 51% of the business in 2016.

In 2015, Intel acquired programmable logic device maker Altera for \$16.7 billion, mainly to serve large data center customers looking for customized server processors with field-programmable gate arrays. We view the rationale for this deal more favorably, as it is predominantly catered to the data center group that has bolstered Intel's revenue growth in recent years amid tepid demand for PCs. In 2017, Intel acquired Mobileye for \$15.3 billion, in order to kick-start its prospects in advanced driver assistance systems and autonomous driving. Albeit an expensive purchase, we concede Mobileye is a high-growth business that already has considerable design wins across major automakers.

Overview**Profile:**

Intel is one of the world's largest chipmakers. It designs and manufactures microprocessors and platform solutions for the global personal computer and data center markets. Intel pioneered the x86 architecture for microprocessors. It is also the prime proponent of Moore's law for advances in semiconductor manufacturing. While Intel's server processor business has benefited from the shift to the cloud, the firm has also been expanding into new adjacencies as the personal computer market has declined. These include areas such as the Internet of Things, memory, artificial intelligence, and automotive. Intel has been active on the merger and acquisitions front, recently acquiring Altera, Mobileye, Nervana, and Movidius in order to assist its efforts in non-PC arenas.

S&P 500 index data: S&P 500 Copyright @ 2018

All data from Morningstar except U.S. intraday real-time exchange quotes, which are provided by BATS when available. End-of-day quotes for Nasdaq, NYSE, and Amex securities will appear 15 minutes after close. Graph times are Eastern Standard. @ Copyright 2018 Morningstar, Inc.

Contact us. Please read our User's Agreement and Troubleshooting documents.
©2018 Morningstar, Inc. All rights reserved.