Broadcom

Company Overview

Broadcom is a technology company that designs and supplies a wide range of semiconductor products and enterprise software. Throughout Broadcom's 50 years of operations, it has gained a strong market presence and bolsters impressive margins. Hock E. Tan has been the CEO since 2006 and has led the company to extraordinary heights through his aggressive mergers and acquisitions-focused strategies. The company has a history of purchasing and restructuring companies to maximize synergies and lower costs. The most recent of these acquisitions was VMware which was purchased for $69 billion. The goal of the VMware purchase was to expand its hybrid cloud portfolio and move the company away from consumers and towards enterprise solutions. The company's primary customers include WT Microelectronics, Apple, and Dell at 21%, 20%, and 14% of total revenue, respectively. As of early 2023, Broadcom entered into a multi-billion-dollar deal with Apple to use their chips in the United States where they will develop 5G radio frequency components. Since Broadcom's semiconductor sector operates under the fabless business model, they outsource most of their production to Taiwan Semiconductor Manufacturing Company (TSMC), accounting for 32% of AVGO's annual COGS. A key semiconductor product is their router switches. Router switches typically go on top of a server rack and assist in establishing a fast connection between servers in a data farm. The three main router switch chip lines are the Jericho, Tomahawk, and Trident. The most important of these chips moving forward will be the Jericho line as it is optimized for AI and machine learning. The other sector they operate in is Infrastructure Solutions and this involves making applications for enterprises such as DevOps or AIOps.

Industry Overview

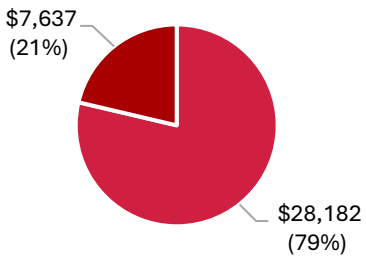
The whole technology sector is currently at the tail end of one of the greatest stock booms ever seen. Below is a graph of the S&P 500, an index already influenced heavily by the tech sector, compared to the semiconductor-specific SOX index. This sector is characterized by high-profit margins and a lot of potential for growth that the market has already mostly priced in. While not the largest in the sector, Broadcom's most similar competitor is Qualcomm. The fabless sector is primarily focused on the initial design and the end markets for the semiconductors. Since operating and maintaining a semiconductor factory is expensive and capital-intensive, fabless companies typically have lower debt and higher profit margins. The fabless sector is extremely competitive and requires constant innovation. Since AVGO offers so many products, they have different "main" competitors for each product. For router switches, Nvidia is the most dominant player offering both ethernet and InfiniBand options whereas Broadcom only offers ethernet. An important trait of companies that succeed in this sector is their ability to balance R&D spending with short-term profits. After the boom, companies that have strong patent barriers and specialize in a few specific products to drive innovation will pull ahead.

In terms of enterprise IT architecture, this is a future-oriented market with almost all large companies shifting to a cloud-based structure. The market is dominated by large players focusing on the overall company such as SAP and Oracle with a few smaller players like AVGO specializing in specific applications to optimize sector-specific business processes.

Enterprise applications can be broken into 3 main groups, central business applications like an ERP or CRM, central sector-specific business applications like the Applied Materials AGS, and smaller and more niche applications to handle additional company needs like the services Broadcom offers. The cyber security market is highly competitive and will only become more important moving into the future. Cybersecurity pairs well with enterprise architecture due to the importance of security in these essential business applications.

Revenue by Segment

($USD, millions)

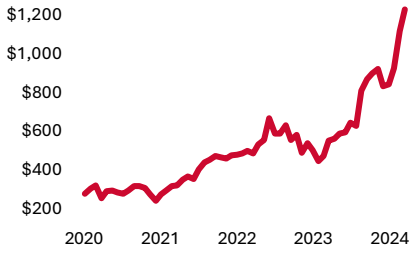


Stock Info

Ticker	AVGO
Price	$1,230
52-wk Hi/Lo	$572.10 - 1,284.55
Mkt Cap (Billions)	$575.81

Financials	(in millions)
Revenue	$35,819
EBITDA	$20,554
EPS	$32.98
ROE	60.31%
ROA	19.28%
ROI	23.57%
P/E	25.89x
EV/Sales	9.92x
EV/FCF	33.43x
Debt/EBITDA	2.42x

AVGO 5Y



Competitors (Mkt Cap)

AMD	284.78B
NVIDIA	1.50T
Texas Instruments	150.93B
Qualcomm	169.87B

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Broadcom, Inc

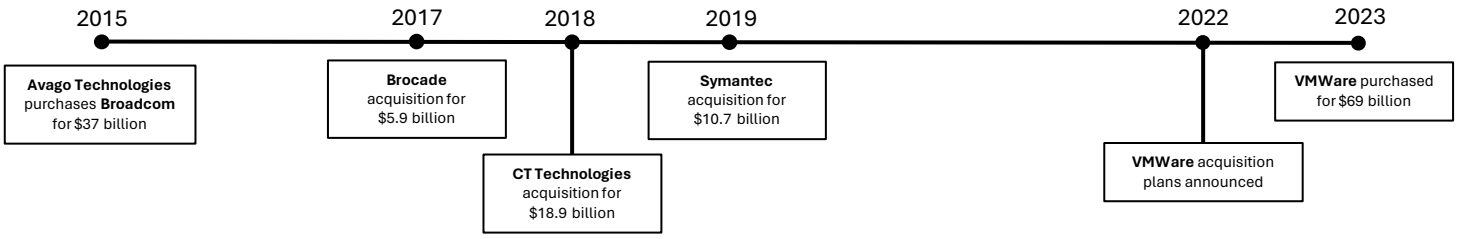
SELL Theses

Broadcom has been doing extremely well and boasts strong cash flows and profit margins. The stock seems strong on paper, but the market has already priced in strong growth and the stock is currently overvalued. My comparison analysis shows the company is overvalued with the medium P/E ratio for comparable companies being 23x compared to AVGOs 40x. Concerns related to the purchase of VMware and its ability to establish effective synergies and turn around the previously declining company prevent me from supporting a buy thesis. Another worry revolves around the business model that has allowed Broadcom to grow to its current size and its comparisons to General Motors. I also believe there to be better alternatives to Broadcom such as Qualcomm. This all being stated, this stock will most likely go up in the short term due to the growth rate of the tech sector, but I still recommend a hold/sell.

Lack of organic growth and insufficient R&D budget to maintain competitive advantage

When looking at the semiconductor sector, almost all companies have been caught up in the tech bubble, but this can't last forever. Looking toward the future, few companies will prevail as the leaders in the industry and a key trait will be focusing on a strong R&D budget that funnels into specific key products. A lot of Broadcom's recent growth has been seen through acquisitions, leading it to become a pseudo-private equity firm. They purchase late-stage companies and slash costs through restructuring and layoffs. My prediction is that they will have been spread too thin to maintain a strong competitive advantage due to the variety of technology-focused products. It will become more and more expensive to make any technological advancements and Broadcom will fall behind if it doesn't pick a lane. Just within their router switch segment, they maintain three main chip lines depending on the type of data center. This is a highly competitive market, competing directly with Nivida. Not only does Nivida have a larger R&D budget, but it specializes in a few products allowing it to maintain a competitive advantage. In this case, Broadcom offers comparable switches with small discrepancies in speed between the companies, but this may change if they don't specialize or increase their R&D budget. AVGO spent 5.23 billion on R&D, but this is distributed across several different business segments and is relatively small compared to Qualcomm's and Nvidia's 8+ billion-dollar budgets. In this highly competitive market, focusing R&D effectively will be the key driver of long-term success and Broadcom has a good risk of falling behind.

Acquisition Timeline (2015 – 2023)



Risky Acquisition of VMware

VMware was most known for the virtualization software that allowed one to run multiple virtual machines at the same time. This software was widely popular and the industry standard for years, but this is set to change. Currently, companies are shifting over their enterprise applications to massive cloud providers such as AWS or Azure. These companies have reached a certain size where vertical integration is not unrealistic in the next 5 or so years. AWS has already taken steps to build its own server infrastructure and network architecture, and virtualization of its VMs is next. I believe Broadcom acquired VMware to slash costs and squeeze out a few years of revenue from banks still relying on physical mainframes. Due to the success of previous mergers, the market has already priced in a mostly successful restructuring plan and good cost synergies. A lot of VMware executive members left before the merger due to worries of a culture clash, but they may have had crucial information on how to effectively restructure. Along with my concerns about the actual integration of VMware products into AVGO, this deal was purchased with $30 billion dollars in term loans, and an additional $8 billion in debt was assumed from VMware on top of their previous $40 billion total debt. Considering Broadcom's current high cash flow, this shouldn't be a problem in the short term, but if the VMware sales aren't as strong as expected, this could significantly inhibit their ability to pay off their debt. This increased debt may also lead to less money going into R&D, leading me to worry that they will fall behind competitors that are more specialized and have more invested in research.

Final Thoughts

Moving into late 2024 and beyond, it will be interesting to see the dichotomy between large name-brand companies vertically expanding and taking control of their manufacturing, as opposed to more unknown companies focusing on pouring R&D expenses into specific products to maintain a competitive advantage. For example, Apple has been trying to make its chips for a while now, but in September it signed a 3-year contract to continue using Qualcomm's Snapdragon chip in their phones. With Qualcomm investing $8 billion dollars into just a few products, there is a cat-and-mouse game that arises with Apple trying to catch up. This trend spans the industry and will be something I will continue to follow, especially looking at the enterprise application industry.

VIRGINIA TECH SEED

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