

## ANALYST(S)

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Companies mentioned in this report with a Buy rating:

- **Adobe** (ADBE - \$462.01) - SFL
- **Amphenol** (APH - \$109.14) - SFL
- **Analog Devices** (ADI - \$118.15)
- **Broadcom** (AVGO - \$329.21)
- **Check Point Software** (CHKP - \$128.08)
- **Cisco Systems** (CSCO - \$41.87)
- **Cognizant** (CTSH - \$66.89)
- **IBM** (IBM - \$123.84) - SFL
- **Keysight Technologies** (KEYS - \$104.00)
- **Mastercard** (MA - \$332.40)
- **Microsoft** (MSFT - \$209.70) - SFL
- **Nvidia Corporation** (NVDA - \$485.54) - SFL
- **PayPal** (PYPL - \$192.44) - SFL
- **Salesforce** (CRM - \$205.11) - SFL
- **Texas Instruments** (TXN - \$138.48) - SFL
- **Visa** (V - \$200.99) - SFL

Companies mentioned in this report with a Hold rating:

- **Apple** (AAPL - \$462.83)

Prices and opinion ratings as of market close on 08/19/20 and subject to change. Source: Bloomberg. SFL indicates companies on the Edward Jones Stock Focus List.

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## Investment Overview

Technology is the largest component of the S&P 500 and plays an important role in many industries across the global economy. We maintain an optimistic long-term view of the sector, which we believe is buoyed by several long-term trends. While we expect the sector to deliver above-average growth, the sector faces several risks related to potential regulation and trade. Companies exposed to these long-term trends that maintain healthy balance sheets will outperform over time, in our view.

**Technology Spending Remains Robust** - Technology spending remains elevated as many businesses continue to invest in newer technology to increase efficiency and enhance the overall customer experience. We expect technology spending to remain elevated for the next several years.

**Cloud, Big Data and Artificial Intelligence Driving Investment Spending** - The emergence of cloud services, data collection and the resulting analytics has driven substantial investment across the technology landscape. As more companies move their technology platforms to the cloud and embrace data analytics, investment in cloud infrastructure and spending on cloud services should remain robust.

**Internet of Things and Fifth Generation (5G) Are Opportunities** - As the number of connected devices increases and 5G services are rolled out, the rise of the Internet of Things (IoT) and the continued build-out of 5G capabilities should provide growth for the various components and infrastructure needed.

**Card, Digital and Mobile Payments Driving Growth** - The continued evolution of how consumers pay for goods and services provides attractive growth for payment providers. While the continued shift from physical currency to cards continues, more and more consumers are purchasing items through their computers or smartphones. This continual change in consumer payment preference should provide attractive long-term growth.

**Coronavirus Short-term Headwinds** - The spread of coronavirus will likely impact manufacturing and distribution of technology components and finished goods. We also anticipate decreased demand due to economic weakness globally. In our view, these will have an outsized impact on hardware and semiconductor companies, and less of an impact on software companies. Despite the negative near-term impacts of the virus, our long-term thesis around technology stocks remains unchanged.

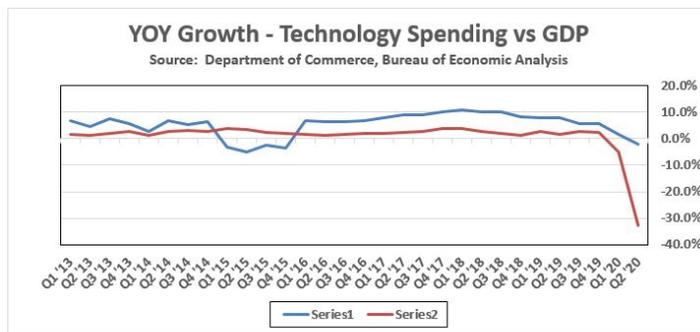
**Valuation** - We believe that our Buy-rated stocks trade at an attractive price-to-earnings (P/E) ratio relative to the companies' expected growth outlooks.

## Technology Spending Supportive of Growth

Overall technology spending continues to grow faster than the overall economy. Technology spending encompasses many business aspects, from purchasing new computers to building out data centers. Prior to the COVID-19 pandemic, U.S. GDP had grown on average 2.5% over the past five years. Over that same time period, the total dollars spent by businesses on technology has grown on average 5.8% (**Figure 1**). These healthy levels of investment touch many sectors within technology, ranging from hardware sales, software, and mobile-application development. This should help drive attractive sales growth across technology stocks over the next several years.

While a portion of this spending is for maintenance, a growing amount continues to be deployed for new technology and resources. Some of the bigger drivers include investments related to the cloud, analytics and software, all with the aim of cutting costs and creating a more seamless, tailored experience for customers. For example, a retail company would invest in a mobile platform, making it extremely easy for its potential customers to shop, purchase and pay through their smartphone. These types of digital experiences are growing more and more because customers demand it. This shift to more cloud-based digital experiences should help support technology spending growth.

Figure 1



Source: U.S. Department of Commerce, Bureau of Economic Analysis

## Cloud, Big Data and Artificial Intelligence Increasing in Importance

Within technology spending, cloud services and the resulting analytics have become increasingly important for companies around the world. Putting data or services "in the cloud" essentially means a company uploads its data or services to a server run by a third party. Companies can effectively "rent" cloud capacity to run their applications and store data. For most companies it is cheaper to rent

the technology infrastructure than to build out and maintain their own infrastructure onsite.

With cloud adoption still relatively light, this will likely support continued spending by cloud-service providers to build out the required infrastructure and capacity to support this growth. This spending encompasses semiconductors, routers, switches, servers and mainframes. Since 2010, capital investment by the main cloud-service providers has grown by 31% per year on average. The massive growth in data centers to provide this infrastructure has resulted in companies that are known as "hyperscalers" because of their substantial cloud services. While we don't expect this level of growth to continue, we expect it to remain elevated for the next several years.

The advent of the cloud has also spurred a substantial increase in data collection and the resulting analysis of this data, commonly referred to as "Big Data." The amount of data generated every year is tremendous. For example, in the past two years, 90% of the data in the world was generated, coming from things like Internet searches, purchases or emails. Cloud providers not only provide storage capacity, but also the analytics ability for all of this data. Collecting data, analyzing it and discovering useful conclusions have become increasingly important as companies try to target specific customers with advertising, and then create new products and services based on customer trends.

To aid in analysis, most companies use some form of artificial intelligence (A.I.) or machine learning (ML) to more effectively sort through large amounts of data to reach actionable conclusions. For example, a retailer could sift through its store data and find certain products sell better if placed in a certain area of the store, or more readily discern consumer preferences based on that store's location. While it is complex, the end goal is to use technology and data to create a frictionless, tailored client experience to drive stronger sales and to lower overall costs for the company.

## Internet of Things and 5G Are Opportunities

The Internet of Things (IoT) is a blanket term used to refer to connected, or "smart," devices such as thermostats, TVs, smartphones, digital assistants, cameras, etc. Consumer consumption has evolved from one device per person to multiple devices per person. This shift has resulted in increased demand for two things: the components needed for smart devices and the need for greater network

connectivity. To make a device smart requires additional components, such as semiconductors. As the proliferation of connected devices continues, this creates greater demand for needed electrical components.

In order for networks to handle the growing number of connected devices and significant amount of data that is transferred, networks must provide the required bandwidth to handle this volume. This comes in the form of 5G networks, which offer greater capacity and speed to handle the growing number of connected devices. The rollout of 5G networks will require a substantial amount of investment, driving demand for infrastructure components like modem chips and radio-frequency filters. In our view, the growth in connected devices and the build out of 5G networks should support demand for semiconductors and related components over the next several years.

### Card and Digital Payments Offer Long-term Growth

The rapidly changing world of payments presents one of the more attractive areas for growth within technology. While growing consumer spending certainly matters, how consumers make payments is becoming increasingly important. Consumers continue to gradually shift from cash payments to card payments. Despite heavy adoption in the U.S., cash payments still represent a majority of total payments globally, particularly in Europe (**Figure 2**). This presents an attractive growth opportunity as more payments move to cards. As the dominant payment networks expand into new markets and sign on new merchants, it creates a powerful network effect. This makes it extremely difficult for new companies to compete with the established payment networks. As consumer spending continues to gradually increase and the adoption of cards grows globally, we expect the payment processors to benefit from this growth.

Figure 2

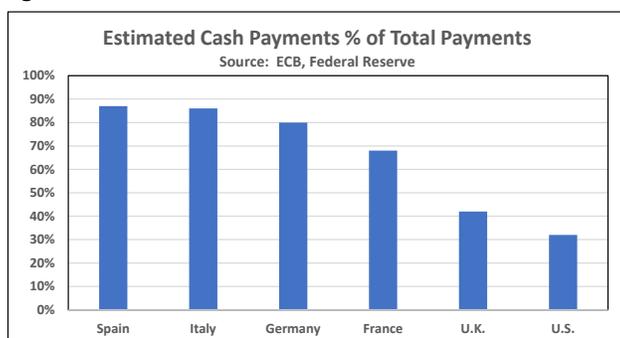


Figure 2 Data is as of 12/31/2018.

A second area of growth within payments is the growing adoption of digital payments. Many consumers are choosing to complete purchases digitally, using a computer or a smartphone. The growing adoption of digital payments drives greater purchasing volume and the demand for what are known as digital wallets. Digital wallets will store a consumer's information securely online, simplifying digital payments. Digital wallets can usually send all relevant information to a retailer with the click of a button, making the experience nearly frictionless and comparable to swiping a card at a physical location. As consumer preference for digital purchasing grows, this should drive transaction-volume growth across payment networks.

### Sector Challenges and Risks

We believe there are several key risks to consider when investing in technology stocks. First, there is an increased focus on regulation of large technology companies. While no significant regulations or laws have been passed that impact these companies, the increased debate ranges from heightened regulation to breaking up some of the larger tech companies.

Second, the potential impact from tariffs and trade risks could impact technology stocks. Many technology companies manufacture and export products to China, or vice versa. This means many technology companies are directly impacted by trade concerns, especially the potential for tariffs. Semiconductor companies are usually impacted the most, with software and services companies usually impacted the least. While longer-term we expect there will eventually be a trade deal between the U.S. and China, in the near term we expect increased volatility in technology stocks due to uncertainty around trade.

Finally, many technology stocks face an increasing technology curve, such as faster modem chips, faster switches for data centers, or faster processing cores. To stay ahead of the competition, let alone keep up with it, usually requires continued significant investment in research and development and/or equipment to manufacture products. If a technology company cannot keep up with the pace of change and lags rivals, it could quickly lose market share or become obsolete.

### Near-term Risks and Impacts From the Coronavirus (COVID-19)

The major challenges facing the technology industry related to the coronavirus can be grouped into three buckets: manufacturing in China, supply-chain disruptions, and overall impacts to demand.

While manufacturing capacity has been challenged for the sector, reports indicate that manufacturing capacity is rebounding in China. However, while manufacturing is recovering, the various shutdowns of businesses across the globe have impacted the overall supply chain, limiting the movement of materials for product manufacturing and the delivery of finished goods. Demand is the final component, which will vary across companies. For example, a software-subscription company catering to large corporate customers may not experience as much of a fall in demand because software is not dependent on manufacturing or the global supply chain. On the contrary, semiconductor and hardware companies may experience supply-chain disruptions or a decrease in demand. An example would be semiconductors that go into PCs or smart phones, where demand will likely be weaker due to falling consumer demand or various store closures. We believe it is paramount in times of elevated uncertainty and volatility to invest in companies that have strong balance sheets and a more visible earnings trajectory. We favour software and services companies in this environment because their businesses will likely be less impacted relative to other technology names due to less reliance on physical manufacturing and the global supply chain.

### How to Invest in Technology Stocks

We recommend that technology stocks comprise 20% of an investor's equity portfolio. Broadly speaking, technology stocks tend to be cyclical, underperforming during market pullbacks and outperforming during bull markets. Technology stocks are classified into three industries: software and services, hardware and equipment, and semiconductors and semiconductor equipment.

Software and services is the largest component, and we recommend investors start here when building portfolios. Most of the companies in this industry have exposure to cloud-based products and services or online and digital-payment services. Both of these businesses are major areas of innovation and should drive healthy growth for many of the software-and-services names. Valuations are usually higher for this group, but we believe the premium is warranted given the attractive growth drivers and expected above-average growth. Adobe, IBM, Microsoft, PayPal, Salesforce and Visa are Buy-rated software and services stocks and are all on the Stock Focus List. Check Point Software, Cognizant and MasterCard are also Buy-rated software and services names.

Hardware and equipment is the second-largest industry. Performance of this industry is heavily

driven by Apple because it is about 70% of the hardware and equipment index due to its substantial market capitalization. Stocks in this group focus on manufacturing the equipment and components needed for various products as well as the distribution of various technology components. While valuations tend to be lower for this group, this is represented in a lower growth outlook. Amphenol is Buy-rated and on the Stock Focus List. Cisco, Keysight Technologies and Motorola Solutions are also Buy-rated hardware and equipment names.

Semiconductors and semiconductor-equipment companies are involved with the design and manufacturing of semiconductors for use across a broad range of end-markets, ranging from mobile phones to automobiles. Semiconductor demand has weakened, impacted by softer demand for chips that go into mobile phones, falling demand for memory chips, and the lingering uncertainty related to trade concerns.

Semiconductors fall into two broad classifications: digital and analog. Digital chips tend to be state-of-the-art, pushing the envelope to make chips smaller, denser and faster. Examples of digital chips would be modems or processors found in smartphones. Analog chips are needed to convert continuous 'physical' signals such as temperature, sound or speed into digital data. Unlike their digital counterparts, analog manufacturers do not require state-of-the-art equipment and are not in a race to make the fastest or smallest chip. Examples of analog chips would be a heartbeat monitor in a wearable device. Texas Instruments and Nvidia Corporation are both leaders in their respective chip markets and are on the Stock Focus List. We also have a Buy rating on chip maker Broadcom.

**Valuation** -- Despite the strong performance in recent years, we believe that the valuations of large-cap technology companies remain attractive relative to their growth outlook. Larger companies tend to be more established and exhibit less volatility compared to small- and mid-cap peers. We see the most opportunity in companies that have exposure to our identified growth drivers, which should offer long-term growth above the sector average. When valuing technology stocks, we use a combination of valuation methodologies, including P/E ratios on an absolute and relative basis, as well as discounted cash flow (DCF) analysis.

**Please see the full opinions of the individual companies mentioned in this report for additional information, including valuation and risks.**

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