

CISCO SYSTEM (CSCO)

March 11, 2020

Networking and Communication Equipment

Stock Rating

Buy

Investment Thesis

We recommend a buy stock rating for Cisco System Inc. Cisco System has been a leading player in the networking and communication equipment industry as the company generates a huge portion of revenue from switches and routers products. In addition, Cisco is also developing various trending technological products such as intent-based network and IoT. Therefore, we believe that Cisco is expecting a strong revenue growth in the next five years.

Drivers of Thesis

- Cisco states in their annual report in 2019 that they are transforming their offerings to meet the evolving needs of our customers. We believe that Cisco will be benefiting from this transformation as more businesses today rely heavily on software and applications
- Cisco will gain a strong position in other trending markets such as AI, cloud-computing, and cybersecurity as they continually acquire tech companies. Therefore, we forecast that Cisco security segment will be increasing 14.65% in 2020
- The strong growth trend for markets such as IoT, ethernet switches and routers, cybersecurity helps Cisco generate more revenue from related products as Cisco released new 100 series wireless access points and routing devices

Risks to Thesis

- Coronavirus will slow down Cisco's revenue and affect its supply chain in 2020
- As Cisco increases its activities in other product markets, Cisco will face intense competitions from different product markets
- As an IT company, Cisco needs to follow market trends closely and spend largely on research and development process to develop products and services

Earnings Estimates

Year	2017	2018	2019	2020E	2021E	2022E
EPS	1.92	0.02	2.63	3.25	3.39	3.56
Analyst EPS growth	-9.85%	-9.89%	130.5%	23.6%	4.3%	5.01%

12 Month Performance



Target Price

Henry Fund DCF	\$68.44
Henry Fund DDM	\$102.81
Relative Multiple	\$54.16

Price Data

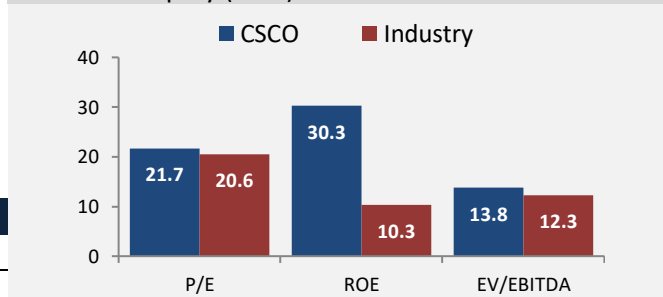
Current Price	\$40.08
52wk Range	\$36.29 – 58.26
Consensus 1yr Target	\$52.62

Key Statistics

Market Cap (B)	\$170B
Shares Outstanding (M)	\$4341M
Institutional Ownership	74.9%
Five Year Beta	1.20
Dividend Yield	3.6%
Est. 5yr Growth	5.3%
Price/Earnings (TTM)	19.47
Price/Earnings (FY1)	21.66
Price/Sales (TTM)	4.50
Price/Book (mrq)	7.16

Profitability

Operating Margin	28.01%
Profit Margin	22.39%
Return on Assets (TTM)	11.25%
Return on Equity (TTM)	30.27%



Data Source: Factset

Company Description

Cisco designs and sells a broad range of internet technologies since 1984. Cisco focuses on networking, security, collaboration, applications and the cloud. Cisco has business globally, which has organized into the following three geographic segments: Americas, Europe, Middle East, and Asia Pacific (APJC). Cisco is the leading player in switches and routers market as majority of Cisco's revenue come from the sales of switches and routers equipment.

EXECUTIVE SUMMARY

Cisco Systems Inc (CSCO) is a technology services provider, which designs, manufactures and sells Internet protocol (IP)-based networking systems and other products. Cisco's revenue come from products and services, which includes four sublines of infrastructure platforms, applications, security and other products. Service business accounts for the rest.

To capture the recent trending technological markets and that have been predicted to seize the market over 3 to 5 years, Cisco has been developed products and services related to 5G, IoT (internet of thing), AI, and intent-based network. In addition, Cisco has acquired many tech companies to increase its researching capability. For example, 5G is predicted to contribute to a global GDP of \$1.4 trillion over the next 10 years. Therefore, we believe that following these trending technological markets will provide sustainable revenue to Cisco.

Although Cisco captures the latest trends in the market, it suffers risks from the possibility of failing a research project, quick life cycle, and international markets. Cisco spends a huge portion of their spending on research and development progress, and they compete by having a short product cycle. These are risks that will likely affect the performance of Cisco in the future.

Current events like trade war and coronavirus create uncertainty in Cisco's industry. We recommend a buy rating for Cisco based on its strong projected market size and revenue growth over 3 to 5 years, but we highly recommend keeping tracking risk factors and current events that are correlated with Cisco and its industry.

Revenue Decomposition

Cisco has decomposed its revenue into infrastructure platforms, applications, security, other products, services. In addition, Cisco is operating in three different areas, which consists Americas, EMEA, APJC. In this section, we are going to break down Cisco' revenue and analyze each revenue sections in details

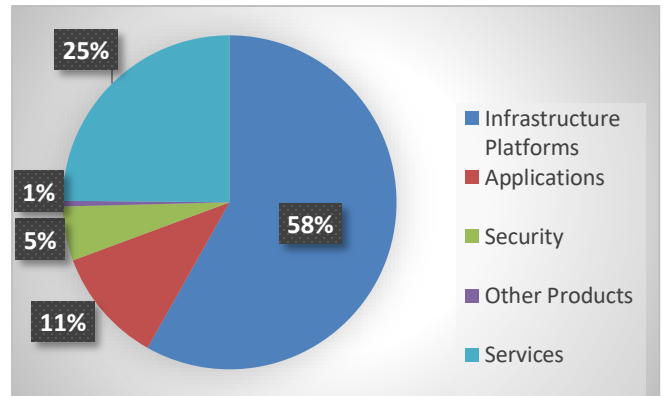
Products and Services

Cisco has broken down its revenue into two main categories, which are products and services. Cisco has further grouped products and services into the following

categories: Infrastructure platform, applications, security, other products, and services. The graph below shows Cisco revenue breakdown as percentage of total revenue in 2019.

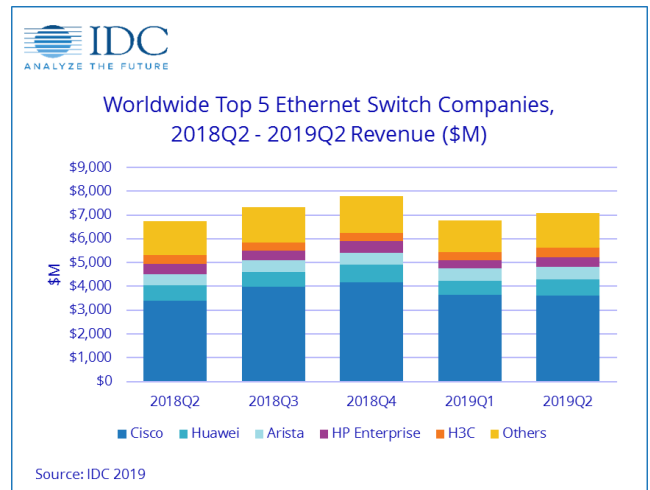
According to Cisco annual report (10K)¹, Cisco infrastructure platform consist of their core networking technologies of switching, routing, wireless, and data center products that are designed to work together to deliver networking capabilities and store data.

Cisco Revenue Breakdown as % of sales in 2019



Data Source: Cisco 10K, 2019

Based on the graph showing above, most of Cisco's revenue come from the infrastructure platforms, which makes up 58% of Cisco's total revenue. This is not surprising because Cisco has been a leading player in this market for a long time.



Data Source: IDC

According to the graph which shows worldwide top 5 ethernet switch companies provided by IDC, Cisco

dominants 60% of the ethernet switch and router market², which means that most of switches and routers in the US are provided by Cisco. Therefore, Cisco has generated a huge portion of its revenue from the infrastructure platforms.

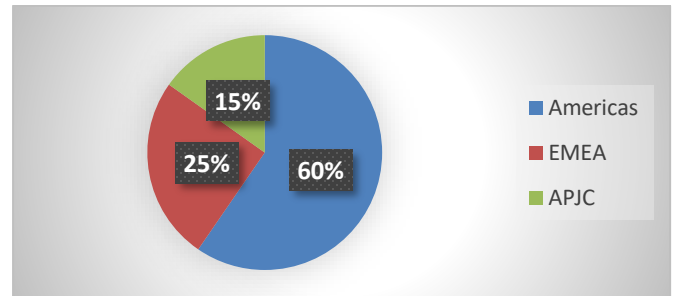
Services section also makes up a huge portion of Cisco's revenue, which is 25%. According to Cisco annual report¹, service consists of technical support services and advanced services. In 2019, Cisco has introduced Customer Experience, which is combining their service and support offerings into one organization that is responsible for the end-to-end customer experience. Revenue coming from service category has been an important component for tech companies as customers frequent require technical and software support from the company.

Applications and security categories are two fastest growing revenue categories for Cisco as they are shifting their business from hardware to software and applications subscription. On the other hand, Cisco begins to invest more on cybersecurity market as they have more data that needed to be protected and desire to build a secure cloud environment. Although revenue coming from these two categories are relatively small compared to the infrastructure platforms and services, these two categories are projected to see a strong growth in the next three years as Cisco emphasizes more on software and cybersecurity markets.

According to Cisco annual report¹, other products category primarily consists of cloud and system management products. However, on October 28, 2018, Cisco completed the sale of the Service Provider Video Software Solutions business which was included in this category. Therefore, other products category only accounts for 1% of Cisco's total revenue and this account will no longer exist on Cisco financial statement after 2019. In this report, we will talk about the sale of the Service Provider Video Software Solutions business in details later.

Therefore, we forecast that Cisco's sales will grow at 7.05%, 7.38%, and 14.65% for segments infrastructure platform, applications, and security based on discussion above.

Geographic (Americas, EMEA, APJC)



Data Source: Cisco 10K, 2019

From the geographical perspective, Cisco operates in three segments: America, EMEA (Europe, Middle East, and Africa), and APJC (Asia Pacific, Japan, and China). The largest return is driven by America segment, which takes up a 60% of Cisco's total revenue. In addition, EMEA and APJC account for 25% and 15% in 2019¹ based on the graph showing above.

Most of Cisco's products are manufactured in mainland China and Mexico as China and Mexico have relatively low cost of labor compared to the other countries. China has more Cisco's factories than Mexico, and Cisco has a research and development center in China. However, with the current economic situation (trade war and coronavirus), we believe that Cisco's revenue coming from all these three segments will decline, especially from the APJC segment. Although we are expecting to see a decline in revenue from EMEA and Americas segments, APJC will suffer a higher declining rate than other two segments in 2020. Therefore, we believe that Americas region will still be the main market for Cisco system.

RECENT DEVELOPMENTS

In this section, we are going to analyze Cisco's recent developments and their strategies to gain more market share in networking and communication equipment industry. Topics include transition from hardware to software focused, SPVSS business, and acquisition.

Second Quarter Earning

The computer-networking giant Cisco said it racked up net income of \$2.9 billion, or 68 cents per share in their second quarter earnings. In addition, Cisco said that revenue declined 4% year-over-year to \$12.01 billion, and they

declared a quarterly dividend of 36 cents per common share, up 3% over the previous quarter. Cisco beats analysts' estimates, but investors were not impressed with the company's continuing revenue declines, and the stock is now trading down around 4% after hours.

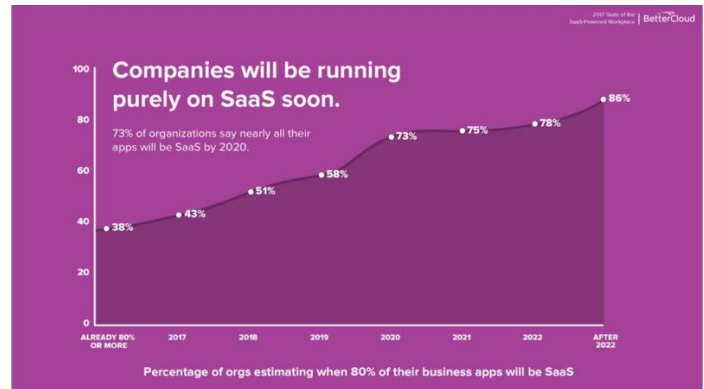
As macroeconomic issues like Brexit and trade with China stabilize, "uncertainty will dissipate and some of our customers will pick up again," said by Cisco Chief Executive. In addition, we believe that concerns over the coronavirus will have some impact in China, where Cisco gleans about 2% of its total sales, but it won't blunt what has been a gradual turnaround. At this point, we believe that the coronavirus situation in China will not have an impact on Cisco's sales in the third quarter.

Transition to Software and Application

Cisco states in their annual report in 2019¹ that "We are transforming our offerings to meet the evolving needs of our customers. As part of the transformation of our business, we continued to make strides during fiscal 2019 to develop and sell more software and subscription-based offerings."

In order to transform their business from hardware to software focused, Cisco has introduced several software arrangements including system software, on premise software, hybrid software and SaaS offerings. Cisco has made some progresses on transforming their business as they increase the investment on their collaboration software (unified communication, Cisco Telepresence), AppDynamics, and IoT software offerings. As a traditional leading player in the hardware industry, Cisco needs time to fully transform their business, but we believe that Cisco made the right decision.

One of the areas that Cisco emphasizes heavily on is SaaS (Software as a service). SaaS is a software distribution model in which a third-party provider hosts application and makes them available to customers over the Internet. According to Finance Online³, \$76 billion is the expected growth of the SaaS public market by 2020.



Data Source: Finance Online

In addition, many companies are expecting to run purely on SaaS based on the graph above. The data suggest that 86% of apps will be SaaS after 2022³. On the other hand, the affordable price of SaaS technology helps expand the corporate ecosystem with a number of new apps and involve everyone on board in how those apps are managed and operated.

Therefore, we believe that Cisco has made the right decision of transforming their traditional business and we forecast a revenue growth of 7.38% for Cisco application segment.

SPVSS Business

In the second quarter of fiscal 2019, Cisco has completed the sale of the SPVSS (service provider video software solutions) business for around \$1 billion. Cisco has recognized an immaterial gain from the transaction with revenue of \$168 million and \$903 million for years ended July 27th, 2019 and July 28th, 2018. Permira funds has completed the acquisition of Cisco's Service Provider Video Software Solutions business and created a new company named Synamedia.

"While we are in a golden age of TV, our customers face challenges including the rising cost of content, soaring piracy levels, and the impact of large OTT challengers on the market." said by Yves Padrines, CEO of Synamedia. Cisco saw the difficulty of continuing their video service business as more people move away from the cable TV to online streaming service, and they saw a significant decline in revenue from SPVSS business. On the other hand, competitions in online streaming service are harsh. Netflix, as one of the biggest online streaming service providers, creates a high barrier for other companies to enter this

industry. Cisco, as a traditional hardware company, has little chance surviving in this industry.

According to Yvette Kanouff⁴, Cisco's formal manager of SPVSS business, "Cisco's strategy is focusing on our five key areas of networking, multi-cloud, security, data, and collaboration. Given this strategic direction, it is the right time for the SP video group to be a stand-alone company." We believe that Cisco made the right decision to sell off its SPVSS business and focus on trending fields (security, multi-cloud, networking) that they are good at researching. We believe that selling SPVSS business do not have a huge impact on Cisco's sales since historical sales of SPVSS business were relatively small compared to the total sales.

Acquisitions

Cisco, as a company with strong financial capability, has increased its speed of acquiring companies to strength their products' research capability in different markets. In 2019, Cisco has acquired five companies including Exablaze, Cloud Cherry, Voicea, Sentryo, and Singularity Networks. In this section, we are going to analyze some of these five companies in details.

According to Cisco Exablaze acquisition announcement⁵, Exablaze technology complements Cisco's networking portfolio and plays a key role in the delivery of next-generation platforms for low-latency applications. By acquiring Exablaze, it complements Cisco's current switching technology with low latency rate, which further advances Cisco's leading position in the ethernet switch and router market.

As more data are being collected and stored in Cisco's data centers, Cisco has realized the importance of data analytics. Cloud Cherry is a company that focus on predictive analysis. "Together with Cisco's cognitive approach, companies can transform their contact center from delivering reactive care to providing cutting edge predictive support and move from isolated customer interactions to cohesive, engaging experiences resulting in improved business outcomes."⁶

Voicea is a company that focus on AI technology based in California. According to Cisco Voicea acquisition announcement⁷, "this acquisition reflects Cisco's vision of Cognitive Collaboration, interoperability, and workplace transformation through combining the power of AI, ML,

software, hardware, and the network to remove friction and get work done faster and smarter." With Voicea technology, Cisco can improve their existing software function and utilize AI technology to improve customer service.

Cisco is acquiring companies to increase its market share in areas such as cybersecurity, cloud-computing, and networking. Although Cisco is a new player in these markets, they have researched products and gained market shares effectively by acquiring related companies. We believe that Cisco's acquisitions will help them enhance their leading position in the ethernet switch and router market while experiencing a strong growth from newly entered markets. Therefore, we forecast that Cisco's cybersecurity and application segment will see an increase of 14.65% and 7.38% in 2020 as Cisco continue to strength its security and application department by acquiring more companies.

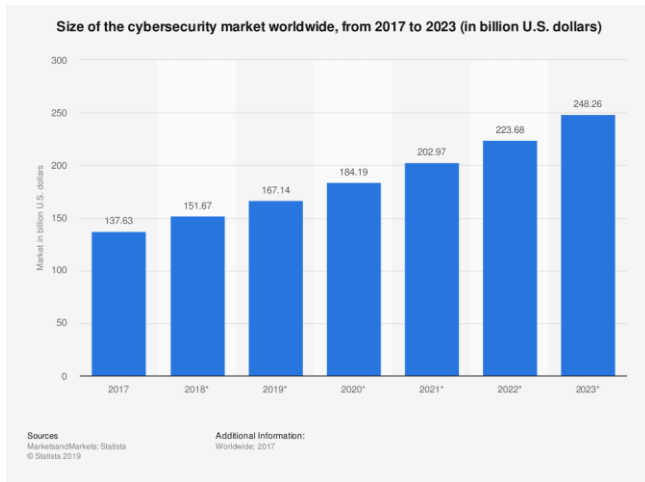
INDUSTRY TRENDS

We believe that Cisco is in the networking and communication equipment industry (see industry report for more details about this industry). Several markets in this industry are trending recently, which includes cybersecurity, multicloud, and internet of thing (IoT). In this section, we are going to analyze these three markets individually.

Cybersecurity

Cyber security becomes an important market in the networking and communication equipment industry as we move into a digitalized world where the public is concerned about data security and personal privacy. As the demand for a safety networking environment increase, companies in the networking and communication equipment industry begin to focus on cyber security and develop related products.

The bar chart below shows the size of the cybersecurity market worldwide, from 2017 to 2023. The global cybersecurity market is expected to grow to 248.26 billion from 167.14 billion in 2019, which indicates that cyber security market is going to expand with a huge demand in the next three years.



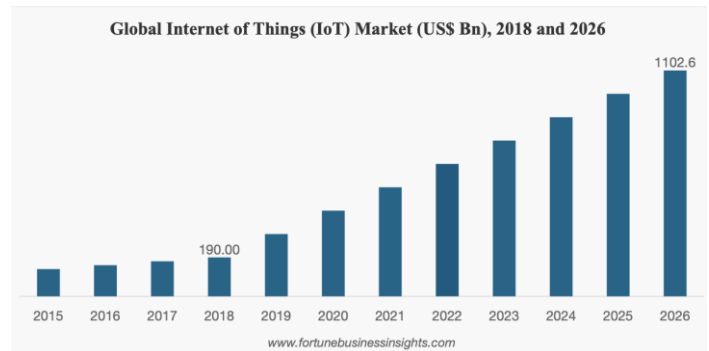
Data Source: Statista

Cisco System is one of the companies that invest heavily on cyber security market recently. Cisco has increased its spending on security product lines, and its revenue of security component as a percentage of product revenue has increased from 5% to 7% for the year 2015 to 2019. According to Cisco annual report in 2019¹, “security continues to be a leading priority for our customers as they defend against ongoing ransomware and account breaches that represent risk of compromise and economic loss to their businesses.” Cisco’s security offerings are powered by cloud-delivered threat intelligence based on Cisco Talos technology, which helps prevent attacks by identifying the most advanced threats.

In addition to develop related products that prevent advanced threats. Cisco has acquired two cybersecurity companies in 2018 and 2019, these two companies are Duo Security and Sentyo. With the advanced security technology coming from these two companies, Cisco will now be able to securely connect any user to any application on any network. In conclusion, we believe that cybersecurity market will be one of the most important markets in the next three years as more data are flowing on internet every day. Cisco has made a huge progress in this market as they have constantly developed advanced products and acquired two cybersecurity companies. Therefore, we anticipate that Cisco will be a major player in this market for the next three years.

Internet of Things (IoT)

Internet of thing refers to connect any devices with an on and off switch to the internet. Devices can be anything such as cellphones, washing machines, and so on.



Data Source: Fortune Business Insights

The above graph shows the global internet of thing market from the year 2015 to 2026. Based on the graph, the market size of internet of thing will increase dramatically from 190 billion in 2018 to 1102 billion in 2026, and the market will expand at a CAGR of 24.7% throughout the forecast years.

Internet of thing will become a main trend in the next two years because of the explosion of IoT devices, apps, and most importantly, machine-to-machine (M2M) devices. According to Cisco 2020 global networking trend report¹⁰, machine-to machine (M2M) devices will account for 51% (14.6 billion) of all networked devices in the year 2022.

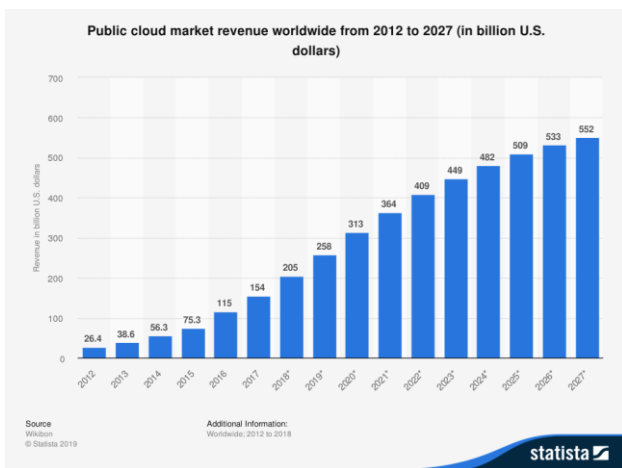
Cisco has accelerated its development of the complementary architecture, network function virtualization (NFV), which will be used to manage IoT devices. On the other hand, Cisco NFV infrastructure solution provides the basic infrastructures to run network function virtualization, which improves cost efficiency and enable faster service deployment.

In addition, Cisco has introduced Catalyst 9000 series of switches which were developed for security, mobility, IoT, and the cloud. With the Catalyst 9000 series of switches, Cisco has advanced its progress in building a network for Internet of thing (IoT). According to Cisco annual report¹, Cisco has already deployed its Catalyst 9000 series of switches into the campus. “Within campus switching are our Catalyst 9000 series of switches that include hardware with embedded software, along with a software subscription referred to as Cisco DNA. Cisco DNA provides automation, analytics and security features and can be

centrally monitored, managed, and configured.” To further advance its role in IoT industry, Cisco has acquired Sentryo, a France-based company which focus on industrial control (ICS) network. Sentryo’s industrial IoT solution will help Cisco develop a strong position in IoT industry. In conclusion we have a strong expectation that Cisco will be the beneficiary under the high growth of IoT industry as Cisco actively participating in IoT industry.

Multicloud Environment

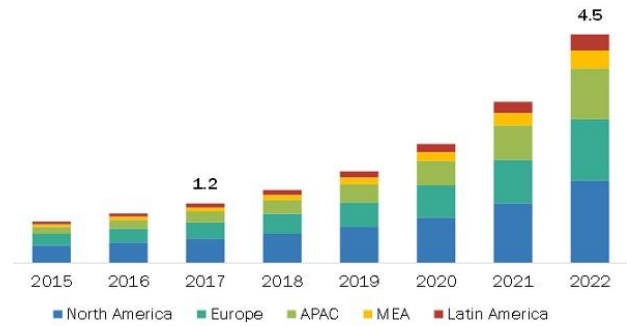
Cloud computing is one of the hottest trends in IT industry these years. According to Microsoft Azure¹¹, cloud computing is the delivery of computing services, including servers, storage, and software to lower operating costs and run the business efficiently. Many companies such as Arista Network and Cisco in the networking and communication equipment industry have developed advanced cloud models and services and put into the market.



Data Source: Statista

The bar chart above shows the public cloud market revenue worldwide from 2012 to 2027. It is clear that the public cloud market will bring a significant amount of revenue to the industry. In addition, IDC (International Data Corporation)²in its 2019 report states that worldwide spending on public cloud services and infrastructure will more than double over the 2019-2023 forecast period.

MULTI-CLOUD MANAGEMENT MARKET, BY REGION (USD BILLION)



Source: Investor Presentation, Secondary Literature, Expert Interviews, and MarketsandMarkets Analysis

Data Source: Markets and Markets

The chart above analyzes the market size in the multi-cloud management market. Looking at this graph, North America will have the largest market size in this market, and it is expected to seize a huge portion of this market in 2022. Following North America, Europe is anticipated to hold the second-largest market size in the cloud market. Lastly, the market size of the cloud market in the Asia Pacific region is expected to be growing as well.

Company like Cisco has already noticed the importance of multicloud environment. In their 2019 annual report¹, they stated that “Our customers are operating in multicloud environments with private, public, and hybrid clouds. Our cloud strategy is to deliver solutions designed to simplify, secure, and transform how customers work in this multicloud world to maximize business outcomes.”

Cisco is focusing on enabling simple, intelligent, automated and highly secure clouds by delivering the infrastructure to navigate complex IT environments through software and subscription-based offerings including Webex, Meraki cloud networking, and certain other Security and Applications offerings. In addition, Cisco has acquired two cloud companies in 2018, which are July Systems and Skyport Systems. Both of these two companies have provided necessary cloud technology to Cisco. In conclusion, Cloud market is one of the fastest-growing markets in the industry, and we believe that cloud business will generate a significant portion of revenue to Cisco in the next three years.

Competitions and Life Cycle

In this section, we are going to outline Cisco's life cycle and identify Cisco's competitors in different markets to evaluate Cisco's position in each market.

Quick Life Cycle

Companies in IT industry is facing rapid technological developments, evolving standards, changes in customer requirements, and new product introductions and enhancements¹. To survive in this industry, companies need to develop new products and improve existing products that meet customers' expectations. As a result, IT companies typically end up with high research and development expense.

According to Cisco annual report in 2019¹, "Recent areas of increased focus include our intent-based networking technologies (which encompasses switching, routing, and wireless technologies within Infrastructure Platforms), security, and analytics products. Our expenditures for research and development costs were expensed as incurred." Cisco are increasing their research and development expense every year as they are developing products in different markets. We believe that Cisco will continue to increase their spending on research and development as they move into the maturity phase.

Intense Competitions

In addition to quick life cycle, Cisco is facing intense competition. Cisco current competitors include: Amazon Web Services LLC; Arista Networks, Inc.; Broadcom Inc.; CommScope Holding Company, Inc.; Check Point Software Technologies Ltd.; Dell Technologies Inc.; Extreme Networks, Inc.; F5 Networks, and so on. As Cisco enters to many new product markets, it will compete with more companies. For example, as Cisco enters cybersecurity market and gain more market share on that market, Cisco is going to compete with other cybersecurity companies that Cisco has never competed with before.

According to Cisco annual report¹, Cisco is also facing price-focused competition from various companies in Asia region, specifically from Chinese companies. Although barriers to enter this industry are relatively low, Companies that are strategic alliance partners with Cisco like Google and Amazon may acquire or form alliances with

other Cisco's competitors, thereby reducing their business with Cisco.

Peer Comparisons

As an IT company, Cisco is facing competitions from different markets as Cisco increase their activities in new product markets, which include ethernet switch and router market, cybersecurity, and SaaS (Software as a service) markets. In this section, we are going to identify Cisco's competitors from each of these three markets and analyze Cisco's position in these markets.

Ethernet switch and router market

Company Name	Market Value	Sales	Net Income	Gross Margin	RD Expense	Sales 3-year growth
Cisco System	171968	49613	11054	65.4%	5736	6.1
Juniper Networks	7484	4365	345	60.5%	854.9	-10.9
Hewlett Packard Enterprise	11659	26485	1205	34.3%	1878	-41.9
Broadcom	99008	24146	2635	72.9%	3582	45.2
Arista Networks	15135	2401	859	64%	431	113.5

Data Source: Factset

Companies that we choose to do a comparison with in the ethernet switch and router market include Cisco System, Juniper Networks, Hewlett Packard Enterprise, and Arista Networks. These companies are operating in the ethernet switch and routers market. The chart above summarizes the comparison results for the year 2019.

In terms of the market value, Cisco is the leading company in this industry with a total market value of \$168278 million. The market value of Hewlett Packard Enterprise and Arista Networks are closed to each other in 2019.

Juniper Networks has the smallest market value in this comparison.

Looking at sales of these companies, Cisco has the largest sales in this comparison group, and it maintains a positive of 6.1% three-year sales growth rate. However, Hewlett Packard Enterprise and Juniper Networks do not maintain a positive three-year sales growth rate, especially Hewlett Packard Enterprise. One thing to be noticed is that Arista Network has a significant three-year sales growth rate of 113.5% in 2019, which is surprising compared to the rest of companies in this group.

To summarize, we believe that Cisco System is the leading player in this industry with the ability to maintain a positive sales growth rate and generate a high gross margin number. In addition, Cisco System has spent the most on research and development in this comparison. As for Hewlett Packard Enterprise, we believe that this company is currently at the maturity phase where its sales and net income are decreasing. On the other hand, Arista Networks is currently at growing phase, and we are expecting to see Arista Networks to make more sales in the next three year. Lastly, although Juniper Networks has relatively small market value compared to the rest of the companies, we expect that Juniper Networks will have a positive sales growth rate in the next two year as the company develop more cloud-based products.

Cybersecurity Market

We choose companies Cisco System, Palo Alto Networks, Norton LifeLock, Check Point Software, and IBM to do a comparison in the cybersecurity market. The chart above summarizes the comparison results for the year 2019.

Cisco has the largest market value in this comparison group followed by IBM, one of the largest companies in the US. For the companies Palo Alto Networks, Norton, and Check Point, their market values are closed to each other. In addition, Palo Alto Networks is the only company in this comparison that has a net loss in 2019.

To summarize this comparison, Cisco System, as the biggest company in this comparison, has achieved a great performance in 2019. Although only 6% of Cisco revenue coming from cybersecurity products in 2019, Cisco is currently developing more cybersecurity products, and its strong position in the market will help Cisco generate more revenue by deploying cybersecurity products. Doesn't like

Cisco, other companies in this comparison such as Norton, Check Point, and Palo Alto Networks are specialized in developing cybersecurity products, but we believe that these companies will be profitable in the next two years as cybersecurity becomes a hottest market in the public. Lastly, as one of the biggest companies, IBM has a negative 3.5 three-year sales growth rate. However, as a mature company, IBM has spent a huge portion on research and development progress, and we believe that IBM will likely to increase their sales in the next two years as they come up with better products and services.

Company Name	Market Value	Sales	Net Income	Gross Margin	RD Expense	Sales 3-year growth
Cisco System	171968	49613	11054	65.4%	5736	6.1
Palo Alto Networks	18596	3782	-174.3	76%	531	99.1
Norton Life Lock	11635	2459	444	85.8%	263	-3
IBM	103731	73560	9434	48.5%	5611	-3.5
Check Point	14807	2037	825.6	90.4%	237.4	14.5

Data Source: Factset

SaaS (Software as a service) Market

We choose companies Cisco System, salesforce, ServiceNow, Shoptify, and workday to do a comparison in the SaaS market. The chart above summarizes the comparison results for the year 2019.

In terms of SaaS market, Cisco is still a leading player in this market with the largest sales and net income in this comparison. Although the majority of Cisco's revenue come from their switches and routers products and only 11% of their revenue come from the software, Cisco is shifting from hardware to software market, and we believe that with Cisco's great foundation in ethernet switch and

router market, they will gain a large market share in the software market as well.

In addition, Salesforce is a company that has a close market value to Cisco. Based on the comparison above, Salesforce’s performance is good in 2019, which has a gross margin of 68%. We believe that Salesforce is one of the fastest growing companies in this comparison, and it has the capability to against Cisco’s position in software market.

Other companies in this comparison includes ServiceNow, Shopify, and Workday. These companies are specialized in software market. Although Shopify and Workday do not generate a net income in 2019, they have a three-year sales growth of 305% and 130%. We believe that as software market becomes more popular, these companies will likely to gain significant revenue from their software products.

To summarize, we believe that Cisco System will still be the leading player in this market as it has strong research capability to develop new products. Salesforce, as one of the fastest growing companies these two years, will likely to compete with Cisco in software market. Although the rest of three companies in this comparison will not have the power to compete with Cisco in the short term, they will benefit from the strong growth of software market in the next three years and be able to sell more software products to the customers.

We have attached a table that summarizes all figures below.

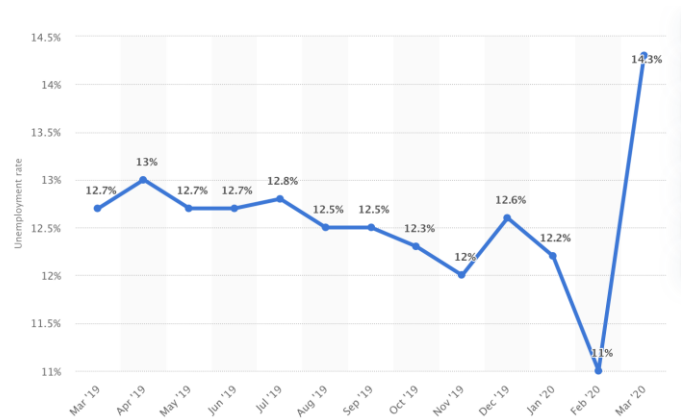
Company Name	Market Value	Sales	Net Income	Gross Margin	RD Expense	Sales 3-year growth
Cisco System	171968	49613	11054	65.4%	5736	6.1
Salesforce	134751	21585	126	79%	2849	103
ServiceNow	54808	4720	626,7	82.5%	755	148
Shopify	68173	2290	-124.8	53.6%	383.1	305
Workday	32514	4452	-480.7	77.2%	1337	130

Data Source: FactSet

ECONOMIC OUTLOOK

Macroeconomic factors are key to analyze the performance of a company or an industry. In this section, we are going to discuss the current economic conditions and macroeconomic factors.

Unemployment

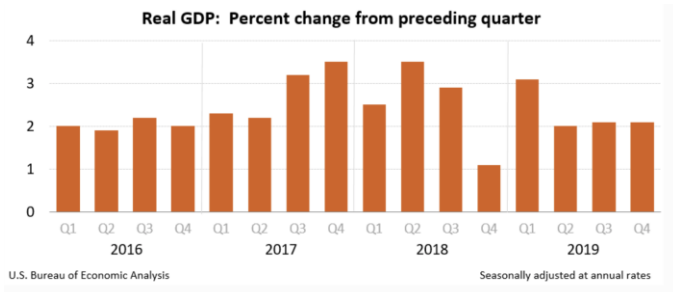


Data Source: Statista

The chart above shows the unemployment rate trend in the US from the year 2019 to March 2020. The current unemployment rate in March 2020 is 14.3%, which is considered a very high unemployment rate. With the impact of the coronavirus, we believe that future

unemployment rate will continue to rise until the outbreak has been under controlled.

Real GDP



Data Source: US Bureau

The chart above shows the real GDP growth by years. According to the US Bureau of Economic Analysis, real GDP increased by 2.1 percent in the fourth quarter of 2019. Compared to the past real GDP growth rate, it is a relatively stable growth rate. However, we believe that US real GDP growth will slow down in the short term due to the outbreak of coronavirus in the US recently, which will also slow down Cisco’s revenue and the growth rate of the industry.

Coronavirus

The outbreak coronavirus in Wuhan, China has created a huge impact globally. Unsurprisingly, coronavirus has affected companies that have businesses in China in this industry, especially their supply chain. Cisco manufactures most of its products in mainland China, and its supply chain are affected due to coronavirus.

The impact of this issue would be small if the coronavirus did not last long. However, the situation of coronavirus is getting worse not only in China but also in other countries. Therefore, we believe that the impact of coronavirus to Cisco and its industry is huge. We strongly recommend investors to keep watching news about coronavirus as it creates a huge impact to the industry as well as the overall economy in other countries.

We believe that the coronavirus helps Cisco with its service segment. For example, Cisco says Webex video-calling service is seeing record usage too, even as competitor Zoom draws all the attention. Although Cisco is losing some consumers due to the coronavirus, its service segment might make up some of its losses.

Trade War

One of the economic issues that we are currently facing is the trade war between the US and China. Cisco has operating branches in China like many other companies in this industry.

The trade war has increased the tariffs on imports into the US. According to Richard¹⁶, companies like Cisco suffered the impact of increased tariffs. “For suppliers of data center technology such as Cisco, a recent increase in import tariffs to 25 per cent has already started to bite.”

We believe that trade war creates a huge impact to Cisco since the trade war has banned the sales of important technology equipment to China. In addition, a high tariff on imports will slow down the revenue’s growth of Cisco, and therefore reduce the market size.

INVESTMENT POSITIVES

- Transition from hardware to software business will help Cisco generate more sales and revenue
- As Cisco acquires more tech companies, they will have the ability to develop products in different markets
- The strong growth trend for markets like Cybersecurity, cloud, and internet of thing (IoT) will further help Cisco gain more market shares in different markets

INVESTMENT NEGATIVES

- Coronavirus will decrease Cisco’s revenue in 2020 and affect its supply chain
- Cisco is facing intense competitions from different markets
- Cisco is in a quick life cycle industry, which requires the company to invest heavily on research and development process to develop products

VALUATION

This section is going to outline our key model assumptions and project Cisco’s future performance by using several valuation models.

Revenue

Cisco experienced a strong growth in revenue of 5.22% from 2018 to 2019, which was the highest revenue growth compared to the last five year. In 2019, Cisco's revenue coming from applications, security, and infrastructure platforms have been the main drivers of its revenue. Although it is likely that Cisco could still maintain a strong growth rate in revenue in 2020, several factors have caused us to forecast a negative growth rate in revenue for Cisco in 2020.

The spread of Coronavirus is one the reasons that we forecast a negative revenue growth rate of 1.71% for Cisco in 2020. The tech industry has suffered a huge impact from Coronavirus as many tech companies have factories in mainland China. Cisco, one of the huge tech companies in the US, produces a significant amount of their products in mainland China. As Chinese government stops workers going back to work, Cisco supply chain has been affected greatly.

In February 18, Cisco published their 10Q, which states that total revenue decreased by 4% compared with the second quarter of fiscal 2019. In addition, product revenue down 6% and service revenue up 5%. (Cisco 10Q). Therefore, we forecast product revenue in 2020 will be down by 2.87% and service revenue will up by 1.80% as there are more uncertainties in the next 6 months.

We forecast a positive 5.37% and 7.11% revenue growth rate in 2021 and 2022 since Cisco is currently developing products related to 5G, IoT (Internet of thing), and AI. These industries are expecting to have a strong growth in the next two or three years. If Cisco deployed these products into the market two years later, it would definitely bring a huge revenue growth to Cisco. In addition, product revenue and service revenue will be growing at a fast rate as people begin to use new generation products and require more technical services.

We forecast a positive 2.01% and 3.39% revenue growth rate in 2023 and 2024. We believe that revenue coming from products and services will grow slightly slower than 2022, that is because as more people and businesses get used to the new generation products, they will stop buying new products and require technical services. However, we forecast a revenue growth of 3.39% in 2024, and we believe that Cisco will come up with new products as most tech companies have quick life cycle, which means that

they need to develop innovative products to keep up with the market trend.

In conclusion, we believe that Cisco will experience a negative revenue growth rate in 2020 due to the current economy situation. However, as newly developed products being deployed into the market in the next two years, Cisco will generate a strong product revenue, which drives up their total revenue. In the long term, Cisco will maintain a stable performance by developing products that meet customers' demand. Therefore, I forecast that Cisco's revenue will increase from 51016 million in 2020 to 60728 million in 2024.

Research and Development

One of the most important account for a tech company is research and development. As a tech company, Cisco has a quick life cycle, and it means that Cisco has to constantly develop products that meet customers' demand. We believe that Cisco's research and development expense will increase year by year as they start researching and developing new products like high-speed router and cloud-platform. Therefore, we have projected that Cisco's research and development expense will increase every year.

Valuation Models

The current price of Cisco System is \$40.08 as for March 10, 2020. I have used three models to predict the stock price of Cisco system, which are discounted cash flow model, dividend discount model, and relative PE model. Discounted cash flow model has given me a target price of \$68.44, dividend discount model has provided me a target price of 102.81, and relative PE has given me a target price of \$54.16. From my opinion, I think discounted cash flow model has provided me with a more accurate prediction than dividend discount model and relative PE model. We have a strong faith in the discounted cash flow model because we are more certain to project the cash flows generated by Cisco each year for the next five year in our model. Therefore, based on our discounted cash flow model, we recommend a buy rating for Cisco system.

KEYS TO MONITOR

Cisco is in an industry which is largely depending on rapid technological developments, evolving standards, changes in customer requirements, and new product introductions

and enhancements. We recommend keeping tracking the recent products and services developed by Cisco System to determine the Cisco's performance. In addition, Cisco spent significantly on the research and development process, so keep tracking of Cisco's product development processes is crucial as well.

Coronavirus is an economic event that will significantly impact Cisco's performance. Therefore, we recommend investors monitoring the latest news regarding Coronavirus.

Lastly, it is important to monitor macroeconomic factors such as Real GDP, unemployment rate, inflation, and Fed interest rate since these key macroeconomic factors will not only affect the economy as a whole but also the company like Cisco.

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Cisco Systems, Inc.*Revenue Decomposition*

All figures in millions of U.S. Dollar.

<i>Fiscal Years Ending Jul. 30</i>	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Infrastructure Platforms	27,817.00	28,322.00	30,191.00	32,320.00	34,980.00	36,630.00	37,853.00	39,314.00
Growth %	-3.58%	1.82%	6.80%	7.05%	8.23%	4.72%	3.34%	3.86%
Applications	4,568.00	5,036.00	5,803.00	6,231.00	6,893.00	7,283.00	7,467.00	7,564.00
Growth %	2.93%	10.25%	15.00%	7.38%	10.62%	5.66%	2.53%	1.30%
Security	2,152.00	2,352.00	2,730.00	3,130.00	3,338.00	3,590.00	3,681.00	3,804.00
Growth %	9.29%	9.29%	16.00%	14.65%	6.65%	7.55%	2.53%	3.34%
Other Products	1,168.00	999.00	281.00	0	0	0	0	0
Growth %	-41.48%	-14.47%	-71.87%	0.00%	0.00%	0.00%	0.00%	0.00%
Product	35,705.00	36,709.00	39,005.00	37,885.00	40,513.00	43,897.00	44,885.00	46,798.00
Growth %	-4.16%	2.81%	6.25%	-2.87%	6.94%	8.35%	2.25%	4.26%
Service	12,300.00	12,621.00	12,899.00	13,131.00	13,243.00	13,679.00	13,850.00	13,930.00
Growth %	2.56%	2.61%	2.20%	1.80%	0.85%	3.29%	1.25%	0.58%
Total	48,005.00	49,330.00	51,904.00	51,016.00	53,756.00	57,576.00	58,735.00	60,728.00
Growth %	-2.52%	2.76%	5.22%	-1.71%	5.37%	7.11%	2.01%	3.39%

Cisco Systems, Inc.*Income Statement*

All figures in millions of U.S. Dollar.

<i>Fiscal Years Ending Jul. 30</i>	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Revenue								
Product	35,705	36,709	39,005	37,885	40,513	43,897	44,885	46,798
Service	12,300	12,621	12,899	13,131	13,243	13,679	13,850	13,930
Total revenue	48,005	49,330	51,904	51,016	53,756	57,576	58,735	60,728
Cost of Sales								
Product	-13,699	-14,427	-14,863	-14,396	-15,395	-16,681	-17,056	-17,783
Depreciation and Amortization	9,497	9,237	9,250	12,858	16,457	20,056	23,655	27,254
Service	-4,082	-4,297	-4,375	-4,202	-4,238	-4,377	-4,432	-4,458
Total cost of sales	-17,781	-18,724	-19,238	-18,598	-19,633	-21,058	-21,488	-22,241
Gross margin	30,224	30,606	32,666	32,418	34,123	36,518	37,247	38,487
Operating Expense								
Research and development	-6,059	-6,332	-6,577	-7,410	-8,349	-9,407	-10,599	-11,943
Sales and marketing	-9,184	-9,242	-9,571	-8,987	-9,134	-9,350	-9,478	-9,560
General and administrative	-1,993	-2,144	-1,827	-1,796	-1,892	-2,027	-2,067	-2,138
Amortization of purchased intangible assets	-259	-221	-150	-130	-90	0	0	0
Restructuring and other charges	-756	-358	-322	-310	0	0	0	0
Total operating expenses	-18,251	-18,297	-18,447	-18,633	-19,466	-20,784	-22,145	-23,640
Operating income	11,973	12,309	14,219	13,785	14,658	15,734	15,102	14,847
Interest Income / expense net	477	565	449	258	302	325	478	321
Interest income	1,338	1,508	1,308	1,130	1,034	1,278	1,234	1,104
Interest expense	-861	-943	-859	-872	-732	-953	-756	-783
Other income / loss, net	-163	165	-97	-82	-42	187	128	236
Interest and other income /loss, net	314	730	352	417	415	446	532	432
Income before provision for benefit from income taxes	12,287	13,039	14,571	13,961	14,918	16,246	15,708	15,404
Provision for benefit from income taxes	-2,678	-12,929	-2,950	-2,932	-3,133	-3,412	-3,299	-3,235
Net income	9,609	110	11,621	11,029	11,785	12,834	12,409	12,169
Per share								
Basic	1.92	0.02	2.63	3.25	3.39	3.56	3.40	3.45
Weighted average shares								
Basic	5,010	4,837	4,419	4,365	4,389	4,412	4,436	4,460
Dividends Per Share	1.10	1.24	1.36	1.41	1.47	1.55	1.48	1.50

Cisco Systems, Inc.*Balance Sheet*

All figures in millions of U.S. Dollar.

<i>Fiscal Years Ending Jul. 30</i>	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Assets								
Current Assets								
Cash and cash equivalents	11,708	8,934	11,750	14,051	19,570	28,326	34,320	42,415
Investments	58,784	37,614	21,663	12,565	7,287	4,227	2,451	1,422
Accounts receivable, net of allowance for doubtful accounts	5,146	5,554	5,491	6,072	6,714	7,425	8,210	9,079
Inventories	1,616	1,846	1,383	1,359	1,432	1,534	1,565	1,618
Deferred tax assets	4,239	3,219	4,065	3,709	3,533	3,134	3,244	3,473
Other current assets	6,449	7,889	7,468	7,672	7,881	8,096	8,318	8,545
Total current assets	83,703	61,837	47,755	45,428	46,418	52,743	58,108	66,552
Other Assets								
Depreciation and Amortization	9,497	9,237	9,250	12,858	16,457	20,056	23,655	27,254
Property and equipment, net	3,322	3,006	2,789	3,873	4,957	6,041	7,125	8,209
Goodwill	29,766	31,706	33,529	33,529	33,529	33,529	33,529	33,529
Purchased intangible assets, net	2,539	2,552	2,201	2,208	2,281	2,462	2,751	2,893
Other Assets	6,249	6,464	7,454	7,657	7,867	8,081	8,302	8,529
Total Assets	129,818	108,784	97,793	105,554	111,509	122,912	133,470	146,965
Liabilities								
Current Portion of long-term debt	4,747	5,238	5,998	5,764	5,329	4,896	4,763	5,328
Commerical Paper	3,245	0	4,193	0	0	0	0	0
Total Short-term debt	7,992	5,238	10,191	5,764	5,329	4,896	4,763	5,328
Accounts payable	1,385	1,904	2,059	2,018	2,119	2,267	2,312	2,382
Income taxes payable	98	1,004	1,149	1,195	1,303	1,459	1,503	1,563
Accrued compensation	2,895	2,986	3,221	3,166	3,336	3,573	3,645	3,769
Deferred revenue	10,821	11,490	10,668	10,916	11,655	12,605	12,783	13,031
Other current liabilities	4,392	4,413	4,424	4,348	4,582	4,907	5,006	5,176
Total current liabilities	35,575	32,273	41,903	33,171	33,652	34,604	34,775	36,576
Other Liabilities								
Long-term debt	25,725	20,331	14,475	14,186	13,902	13,624	13,351	13,084
Income taxes payable	1,250	8,585	8,927	9,284	10,120	11,334	11,674	12,141
Deferred revenue	7,673	8,195	7,799	7,280	8,033	8,848	8,954	9,091
Other long-term liabilities	1,450	1,434	1,309	1,299	1,288	1,278	1,268	1,257
Total liabilities	71,673	70,818	74,413	65,220	66,995	69,687	70,021	72,150
Equity								
Common stock and additional paid-in capital	45,253	42,820	40,266	41,385	42,504	43,623	44,742	45,861
Retained earnings / accumulated deficit	20,838	1,233	-5,903	5,124	16,908	29,741	42,148	54,316
Accumulated other comprehensive income / loss	46	-849	-792	-792	-792	-792	-792	-792
Total Cisco shareholders' equity	66,137	43,204	33,571	45,717	58,620	72,572	86,098	99,385
Noncontrolling interests	0	0	0	0	0	0	0	0
Total equity	66,137	43,204	33,571	45,717	58,620	72,572	86,098	99,385
Total liabilities and equity	129,818	108,784	97,793	105,554	111,509	122,912	133,470	146,965

Cisco Systems, Inc.*Historical Cash Flow Statement*

All figures in millions of U.S. Dollar.

<i>Fiscal Years Ending Jul. 30</i>	2017	2018	2019
Operating Activities			
Net income	9,609	110	11,621
Adjustments to reconcile net income to net cash provided by operating activities	4,267	13,556	4,210
Depreciation, amortization, and other	2,286	2,192	1,897
Share-based compensation expense	1,526	1,576	1,570
Provision for receivables	-8	-134	40
Deferred income taxes	-124	900	-350
Excess tax benefits from share-based compensation	-153	0	0
Gains / losses on divestitures, investments and other, net	154	-322	-24
Change in operating assets and liabilities, net of effects of acquisitions and divestitures	586	9,344	1,077
Accounts receivable	756	-269	-84
Inventories	-394	-244	131
Financing receivables	-1,038	-219	-249
Other assets	15	66	-955
Accounts payable	311	504	87
Income taxes, net	60	8,118	312
Accrued compensation	-110	100	277
Deferred revenue	1,683	1,205	1,407
Other liabilities	-697	83	151
Net cash provided by operating activities	13,876	13,666	15,831

Cisco System.Inc*Forecasted Cash Flow Statement*

All figures in million

Fiscal Years Ending Jul. 30	2020E	2021E	2022E	2023E	2024E
Cash flow from operating activities					
Net Income	11,029	11,785	12,834	12,409	12,169
Depreciation	2,442	2,150	2,286	2,192	1,897
Deferred Tax Asset	2,172	-3,770	-4,289	-6,930	5,207
Change in Accounts Receivables	-581	-642	-710	-786	-869
Change in Inventories	24	-73	-102	-31	-53
Change in other current assets	-204	-209	-215	-221	-227
Change in other assets	-203	-209	-215	-221	-227
Change in Accounts Payable	-41	101	148	45	69
Change in income taxes net	0	0	0	0	0
Change in accrued compensation	-55	170	237	72	124
Change in deferred revenue	248	738	950	178	248
Change in other liability	-76	234	326	99	170
Change in other long-term liability	-10	-10	-10	-10	-10
Net Cash provided by operating activities	14,744	10,263	11,240	6,797	18,499
Cash flow from investing activities					
Proceeds from sales and maturities of investments	-9,098	-5,277	-3,061	-1,775	-1,030
Capitalization of Intangible assets	7	73	181	289	142
Net Cash provided by investing activities	-9,098	-5,277	-3,061	-1,775	-1,030
Cash flow from financing activities					
Proceeds from Issuances of common stock	1,119	1,119	1,119	1,119	1,119
Payment of short-term debt	-4,427	-435	-433	-133	-10,091
Payment of Long-term debt	290	284	278	272	-267
Payment of dividend	-326	-435	-387	-287	-135
Accumulated other comprehensive income / loss	0	0	0	0	0
Net Cash provided by financing activities	-3,345	533	577	971	-9,374
Net change in cash	2,301	5,519	8,757	5,993	8,095
Cash and Cash equivalent Beg	11,750	14,051	19,570	28,326	34,320
Cash and Cash equivalent End	14,051	19,570	28,326	34,320	42,415

Cisco Systems, Inc.*Common Size Income Statement (as % of sales)*

All figures in millions of U.S. Dollar.

Fiscal Years Ending Jul. 30	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Revenue								
Product	74.38%	74.42%	75.15%	74.26%	75.36%	76.24%	76.42%	77.06%
Service	25.62%	25.58%	24.85%	25.74%	24.64%	23.76%	23.58%	22.94%
Total revenue	100.00%	100.00%	100.00%	100%	100%	100%	100%	100%
Cost of Sales								
Product	28.54%	29.25%	28.64%	28.22%	28.64%	28.97%	29.04%	29.28%
Service	8.50%	8.71%	8.43%	8.24%	7.88%	8.43%	8.43%	8.43%
Total cost of sales	37.04%	37.96%	37.06%	36.46%	36.52%	36.57%	36.59%	36.62%
Gross margin	62.96%	62.04%	62.94%	63.54%	63.48%	63.43%	63.41%	63.38%
Operating Expense								
Research and development	12.62%	12.84%	12.67%	12.67%	12.67%	12.67%	12.67%	12.67%
Sales and marketing	19.13%	18.74%	18.44%	17.62%	16.99%	16.24%	16.14%	15.74%
General and administrative	4.15%	4.35%	3.52%	3.52%	3.52%	3.52%	3.52%	3.52%
Amortization of purchased intangible assets	0.54%	0.45%	0.29%	0.25%	0.17%	0.00%	0.00%	0.00%
Restructuring and other charges	1.57%	0.73%	0.62%	0.61%	0.00%	0.00%	0.00%	0.00%
Total operating expenses	38.02%	37.09%	35.54%	36.52%	36.21%	36.10%	37.70%	38.93%
Operating income	24.94%	24.95%	27.39%	27.02%	27.27%	27.33%	25.71%	24.45%
Interest Income / expense net	0.99%	1.15%	0.87%	0.51%	0.56%	0.56%	0.81%	0.53%
Interest income	2.79%	3.06%	2.52%	2.21%	1.92%	2.22%	2.10%	1.82%
Interest expense	1.79%	1.91%	1.65%	1.71%	1.36%	1.66%	1.29%	1.29%
Other income / loss, net	0.34%	0.33%	0.19%	0.16%	0.08%	0.32%	0.22%	0.39%
Interest and other income /loss, net	0.65%	1.48%	0.68%	0.82%	0.77%	0.77%	0.91%	0.71%
Income before provision for benefit from income taxes	25.60%	26.43%	28.07%	27.37%	27.75%	28.22%	26.74%	25.37%
Provision for benefit from income taxes	5.58%	26.21%	5.68%	5.75%	5.83%	5.93%	5.62%	5.33%
Net income	20.02%	0.22%	22.39%	21.62%	21.92%	22.29%	21.13%	20.04%

Cisco Systems, Inc.*Common Size Balance Sheet (as % of sales)*

All figures in millions of U.S. Dollar.

Fiscal Years Ending Jul. 30	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Assets								
Current Assets								
Cash and cash equivalents	24.39%	18.11%	22.64%	27.54%	36.41%	49.20%	58.43%	69.84%
Investments	122.45%	76.25%	41.74%	24.63%	13.56%	7.34%	4.17%	2.34%
Accounts receivable, net of allowance for doubtful accounts	10.72%	11.26%	10.58%	11.90%	12.49%	12.90%	13.98%	14.95%
Inventories	3.37%	3.74%	2.66%	2.66%	2.66%	2.66%	2.66%	2.66%
Deferred tax assets	8.83%	6.53%	7.83%	7.54%	7.17%	6.53%	6.58%	6.69%
Other current assets	13.43%	15.99%	14.39%	15.04%	14.66%	14.06%	14.16%	14.07%
Total current assets	174.36%	125.35%	92.01%	89.05%	86.35%	91.61%	98.93%	109.59%
Other Assets								
Property and equipment, net	6.92%	6.09%	5.37%	7.59%	9.22%	10.49%	12.13%	13.52%
Goodwill	62.01%	64.27%	64.60%	65.72%	62.37%	58.23%	57.09%	55.21%
Purchased intangible assets, net	5.29%	5.17%	4.24%	4.33%	4.24%	4.28%	4.68%	4.76%
Deferred tax assets	8.83%	6.53%	7.83%	7.83%	7.83%	7.83%	7.83%	7.83%
Other Assets	13.02%	13.10%	14.36%	15.01%	14.63%	14.04%	14.13%	14.04%
Total Assets	270.43%	220.52%	188.41%	206.90%	207.43%	213.48%	227.24%	242.01%
Liabilities								
Total Short-term debt	16.65%	10.62%	19.63%	11.30%	9.91%	8.50%	8.11%	8.77%
Accounts payable	2.89%	3.86%	3.97%	3.96%	3.94%	3.94%	3.94%	3.92%
Income taxes payable	0.20%	2.04%	2.21%	2.34%	2.42%	2.53%	2.56%	2.57%
Accrued compensation	6.03%	6.05%	6.21%	6.21%	6.21%	6.21%	6.21%	6.21%
Deferred revenue	22.54%	23.29%	20.55%	21.40%	21.68%	21.89%	21.76%	21.46%
Other current liabilities	9.15%	8.95%	8.52%	8.52%	8.52%	8.52%	8.52%	8.52%
Total current liabilities	57.46%	54.80%	61.10%	65.02%	62.60%	60.10%	59.21%	60.23%
Other Liabilities								
Long-term debt	53.59%	41.21%	27.89%	27.81%	25.86%	23.66%	22.73%	21.55%
Income taxes payable	2.60%	17.40%	17.20%	18.20%	18.83%	19.69%	19.88%	19.99%
Deferred revenue	15.98%	16.61%	15.03%	14.27%	14.94%	15.37%	15.24%	14.97%
Other long-term liabilities	3.02%	2.91%	2.52%	2.55%	2.40%	2.22%	2.16%	2.07%
Total liabilities	132.65%	132.94%	123.73%	127.84%	124.63%	121.03%	119.22%	118.81%
Equity								
Common stock and additional paid-in capital	94.27%	86.80%	77.58%	81.12%	79.07%	75.77%	76.18%	75.52%
Retained earnings / accumulated deficit	43.41%	2.50%	-11.37%	10.04%	31.45%	51.65%	71.76%	89.44%
Accumulated other comprehensive income / loss	0.10%	-1.72%	-1.53%	-1.55%	-1.47%	-1.38%	-1.35%	-1.30%
Total Cisco shareholders' equity	137.77%	87.58%	64.68%	89.61%	109.05%	126.04%	146.59%	163.66%
Noncontrolling interests	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total equity	137.77%	87.58%	64.68%	89.61%	109.05%	126.04%	146.59%	163.66%
Total liabilities and equity	270.43%	220.52%	188.41%	206.90%	207.43%	213.48%	227.24%	242.01%

Cisco Systems, Inc.
Value Driver Estimation

All figures in millions of U.S. Dollar.

<i>Fiscal Years Ending Jul. 30</i>	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
EBITA								
Revenues	48,005	49,330	51,904	51,016	53,756	57,576	58,735	60,728
LESS								
Cost of Sales	17,781	18,724	19,238	18,598	19,633	21,058	21,488	22,241
Research and development	6,059	6,332	6,577	7,410	8,349	9,407	10,599	11,943
Sales & marketing	9,184	9,242	9,571	8,987	9,134	9,350	9,478	9,560
General & administrative	1,993	2,144	1,827	1,796	1,892	2,027	2,067	2,138
Amortization of purchased intangible assets	259	221	150	130	90	0	0	0
PLUS								
Implied interest on Operating Leases	26	26	36	36	36	36	36	36
EBITA	12,755	12,693	14,577	14,130	14,693	15,770	15,138	14,883
Adjusted Taxes								
Income Tax Provision	2,678	12,929	2,950	2,932	3,133	3,412	3,299	3,235
PLUS								
Tax Shield on Restructuring	159	75	68	65	0	0	0	0
Tax on Leases	6	6	8	8	8	8	8	8
Tax Shield on Interest Expense	301	330	301	183	154	200	159	164
LESS								
Tax Shield on Interest Income	468	528	458	237	217	268	259	232
Less Adjusted Tax	2,675	12,812	2,868	2,950	3,077	3,351	3,206	3,175
Plus Deferred Income Taxes	-124	900	-350	-281	-124	-36	-136	238
NOPLAT	9,956	781	11,359	10,899	11,493	12,383	11,796	11,946
Invested Capital (IC):								
Operating Current Asset								
Normal Cash	2,688	2,762	2,907	2,857	3,010	3,224	3,289	3,401
Accounts Receivable	5,146	5,554	5,491	6,072	6,714	7,425	8,210	9,079
Inventory	1,616	1,846	1,383	1,359	1,432	1,534	1,565	1,618
Other Current Assets	6,449	7,889	7,468	7,672	7,881	8,096	8,318	8,545
Operating Current Asset	15,899	18,051	17,249	17,960	19,038	20,280	21,382	22,642
Operating Current Liabilities								
Accounts Payable	1,385	1,904	2,059	2,018	2,119	2,267	2,312	2,382
Income Taxes Payable	98	1,004	1,149	1,195	1,303	1,459	1,503	1,563
Accrued Compensation	2,895	2,986	3,221	3,166	3,336	3,573	3,645	3,769
Deferred Revenue	10,821	11,490	10,668	10,916	11,655	12,605	12,783	13,031
Operating Current Liabilities	15,199	17,384	17,097	17,295	18,412	19,904	20,243	20,744
Net Operating Working Capital	700	667	152	665	626	376	1,139	1,898
Plus: Net Property, Plant, and Equipment (PPE)								
Net Intangible Assets	2,539	2,552	2,201	2,208	2,281	2,462	2,751	2,893
Other Assets	6,249	6,464	7,454	7,657	7,867	8,081	8,302	8,529
PV of Operating Leases	1,808	1,830	1,768	1,732	1,819	1,946	1,985	2,045
Plus: Net Other Operating Assets	10,596	10,846	11,423	11,598	11,967	12,490	13,038	13,466
Deferred Revenue (Long-term)	7,673	8,195	7,799	7,280	8,033	8,848	8,954	9,091
Other long-term liabilities	1,450	1,434	1,309	1,299	1,288	1,278	1,268	1,257
Less: Other Operating Liabilities	9,123	9,629	9,108	8,579	9,321	10,126	10,221	10,349
Invested Capital (IC):	5,496	4,890	5,255	7,557	8,229	8,781	11,081	13,225
Free Cash Flow (FCF):								
NOPLAT	9,956	781	11,359	10,899	11,493	12,383	11,796	11,946
Change in IC	-1,501	-605	365	2,302	671	552	2,301	2,144
FCF	11,457	1,387	10,994	8,597	10,821	11,831	9,495	9,802
Return on Invested Capital (ROIC):								
NOPLAT	9956	781	11359	10899	11493	12383	11796	11946
Beg. IC	6997	5496	4890	5255	7557	8229	8781	11081
ROIC	142%	14%	232%	207%	152%	150%	134%	108%
Economic Profit (EP):								
Beg. IC	6997	5496	4890	5255	7557	8229	8781	11081
x (ROIC - WACC)	136%	8%	226%	201%	146%	144%	128%	102%
EP	9528	445	11059	10577	11030	11879	11258	11267

Cisco System
Key Management Ratios

Fiscal Years Ending Jul. 30	2017	2018	2019	2020E	2021E	2022E	2023E	2024E
Liquidity Ratios:								
Current Ratio (CA/CL)	3.03	2.29	1.51	1.37	1.38	1.52	1.67	1.82
Quick Ratio ((CASH+AR)/CL)	2.98	2.22	1.46	0.61	0.78	1.03	1.22	1.41
Cash Ratio (cash/CL)	2.56	1.72	1.05	0.42	0.58	0.82	0.99	1.16
Asset-Management Ratios:								
Inventory Turnover (Rev/AVG INV)	12.20	10.54	11.60	37.53	37.53	37.53	37.53	37.53
Receivables Turnover (Rev/ AVG AR)	4.77	4.81	4.92	8.40	8.01	7.75	7.15	6.69
Assets Turnover (Rev/Assets)	0.38	0.41	0.50	0.48	0.48	0.47	0.44	0.41
Financial Leverage Ratios:								
Debt Ratio (total debt/TA)	0.30	0.28	0.31	0.24	0.22	0.19	0.17	0.16
LT Debt/Total Asset	0.20	0.19	0.15	0.13	0.12	0.11	0.10	0.09
LT Debt/Total Equity	0.39	0.47	0.43	0.31	0.24	0.19	0.16	0.13
Profitability Ratios:								
Gross Margin ((Rev-COGS)/Rev)	1.59	1.61	1.59	1.57	1.58	1.58	1.58	1.58
Return on Assets (net income/TA)	0.07	0.00	0.12	0.10	0.11	0.10	0.09	0.08
Return on Equity (net income/total SE)	0.15	0.00	0.35	0.24	0.20	0.18	0.14	0.12
Payout Policy Ratios:								
Dividend Payout Ratio (Dividend+Repurchase/EF)	0.57	62.00	0.52	0.43	0.43	0.44	0.43	0.43

Cisco System

Weighted Average Cost of Capital (WACC) Estimation

Cost of Equity:

Risk-Free Rate	1.14%
Beta	1.14
Equity Risk Premium	5.15%
Cost of Equity	7.01%

Cost of Debt:

Pre-Tax Cost of Debt	2.01%
Marginal Tax Rate	0.37
After-Tax Cost of Debt	1.27%

Market Value of Common Equity:

Total Shares Outstanding	4419
Current Stock Price	\$39.93
MV of Equity	176,450.67

MV Weights

84.54%

Market Value of Debt:

Short-Term Debt	10191
Current Portion of LTD	5998
Long-Term Debt	14475
PV of Operating Leases	1601
MV of Total Debt	32,265.00

15.46%

Market Value of the Firm

208,715.67

100.00%

Estimated WACC

6.12%

Cisco System*Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models*

Key Inputs:

CV Growth of NOPLAT	3.00%
CV Year ROIC	108%
WACC	6.12%
Cost of Equity	7.01%

Fiscal Years Ending Jul. 30	2020E	2021E	2022E	2023E	2024E
------------------------------------	--------------	--------------	--------------	--------------	--------------

DCF Model:

Free Cash Flow (FCF)	8597	10821	11831	9495	9802
Continuing Value (CV)					371873
PV of FCF	8101	9609	9899	7486	293196

Value of Operating Assets: 328291

Non-Operating Adjustments

LESS PV of Operating Leases	-1601
LESS ESOPS	-439
LESS Short-term Debt	-10191.0
LESS Long-term Debt	-20473.0

Value of Equity 295587

Shares Outstanding 4419.0

Intrinsic Value of Last FYE \$ 66.89

Implied Price as of Today \$ 68.44**EP Model:**

Economic Profit (EP)	10577	11030	11879	11258	11267
Continuing Value (CV)					360792
PV of EP	9967	9794	9939	8876	284459

Total PV of EP 323035

Invested Capital (last FYE) 5255.4

Value of Operating Assets: 328291

Non-Operating Adjustments

LESS PV of Operating Leases	-1601
LESS ESOPS	-439
LESS Short-term Debt	-10191.0
LESS Long-term Debt	-20473.0

Value of Equity 295587

Shares Outstanding 4419.0

Intrinsic Value of Last FYE \$ 66.89

Implied Price as of Today \$ 68.44

Cisco System

Dividend Discount Model (DDM) or Fundamental P/E Valuation Model

Fiscal Years Ending Jul. 30	2020E	2021E	2022E	2023E	2024E
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EPS	3.25	3.39	3.56	3.4	3.45
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Key Assumptions

CV growth of EPS	4.20%
CV Year ROE	20.00%
Cost of Equity	7.01%

Future Cash Flows

P/E Multiple (CV Year)				\$ 30.92	
EPS (CV Year)					3.45
Theoretical Dividend				\$ 2.73	
Future Stock Price				125.23	
Dividends Per Share	\$ 1.41	\$ 1.47	\$ 1.55	\$ 1.48	\$ 1.50
Discounted Cash Flows	\$ 1.32	\$ 1.28	\$ 1.26	\$ 96.62	

Intrinsic Value as of Last FYE \$ 100.49

Implied Price as of Today **\$ 102.81**

Cisco System

Relative Valuation Models

Ticker	Company	Price	EPS 2020E	EPS 2021E	P/E 20	P/E 21	Est. 5yr EPS gr.	PEG 20	PEG 21
ANET	Arista Network	\$193.12	\$8.76	\$10.09	22.05	19.14	0.074	297.91	258.65
JNPR	Juniper Network	\$21.22	\$1.75	\$1.90	12.13	11.17	0.089	136.24	125.49
MSFT	Microsoft	\$162.01	\$5.68	\$6.33	28.52	25.59	0.144	198.08	177.74
HPE	Hewlett Packard Enterp	\$12.79	\$1.85	\$1.96	6.91	6.53	0.072	96.02	90.63
FFIV	F5 Networks	\$119.95	\$9.60	\$10.23	12.49	11.73	0.098	127.50	119.65
VMW	Vmware	\$120.52	\$6.74	\$7.69	17.88	15.67	0.170	105.18	92.19
Average					16.66	14.97		160.16	144.06

CSCO	Cisco System	\$39.93	\$3.25	\$3.39	12.3	11.8	1.20%	1,022.5	980.3
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Implied Relative Value:

P/E (EPS20)	\$	54.16
P/E (EPS21)	\$	50.75
PEG (EPS20)	\$	6.25
PEG (EPS21)	\$	5.87

Cisco System

Present Value of Operating Lease Obligations

Fiscal Years Ending Jul. 30	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Year 1	300.0	310.0	320.0	330.0	340.0	350.0	346.0	363.0	417.0	392.0	441.0
Year 2	250.0	260.0	270.0	280.0	290.0	300.0	435.0	446.0	467.0	483.0	494.0
Year 3	225.0	230.0	235.0	240.0	245.0	250.0	435.0	446.0	467.0	483.0	494.0
Year 4	175.0	180.0	185.0	190.0	195.0	200.0	178.0	190.0	210.0	234.0	190.0
Year 5	100.0	104.0	108.0	112.0	116.0	120.0	178.0	190.0	210.0	234.0	190.0
Thereafter	290.0	300.0	310.0	320.0	330.0	340.0	183.0	160.0	143.0	111.0	54.0
Total Minimum Payments	1340.0	1384.0	1428.0	1472.0	1516.0	1560.0	1755.0	1795.0	1914.0	1937.0	1863.0
Less: Cumulative Interest	89.0	91.9	94.8	97.7	100.6	103.4	100.1	100.9	105.6	107.1	95.2
PV of Minimum Payments	1251.0	1292.1	1333.2	1374.3	1415.4	1456.6	1654.9	1694.1	1808.4	1829.9	1767.8
Implied Interest in Year 1 Payment		25.1	26.0	26.8	27.6	28.5	29.3	33.3	34.1	36.3	36.8
Pre-Tax Cost of Debt	2.01%	2.01%	2.01%	2.01%	2.01%	2.01%	2.01%	2.01%	2.01%	2.01%	2.01%
Years Implied by Year 6 Payment	2.9	2.9	2.9	2.9	2.8	2.8	1.0	1.0	1.0	1.0	1.0
Expected Obligation in Year 6 & Beyond	100	104	108	112	116	120	178	160	143	111	54
Present Value of Lease Payments											
PV of Year 1	294.1	303.9	313.7	323.5	333.3	343.1	339.2	355.8	408.8	384.3	432.3
PV of Year 2	240.2	249.9	259.5	269.1	278.7	288.3	418.0	428.6	448.8	464.2	474.7
PV of Year 3	212.0	216.7	221.4	226.1	230.8	235.5	409.8	420.2	439.9	455.0	465.4
PV of Year 4	161.6	166.2	170.8	175.5	180.1	184.7	164.4	175.5	193.9	216.1	175.5
PV of Year 5	90.5	94.1	97.8	101.4	105.0	108.6	161.1	172.0	190.1	211.8	172.0
PV of 6 & beyond	252.6	261.3	270.1	278.8	287.6	296.3	162.4	142.0	126.9	98.5	47.9
Capitalized PV of Payments	1251.0	1292.1	1333.2	1374.3	1415.4	1456.6	1654.9	1694.1	1808.4	1829.9	1767.8

Cisco System

Effects of ESOP Exercise and Share Repurchases on Common Stock Account and Number of Shares Outstanding

Number of Options Outstanding (shares):	104
Average Time to Maturity (years):	4.34
Expected Annual Number of Options Exercised:	24

Current Average Strike Price:	\$ 38.21
Cost of Equity:	7.44%
Current Stock Price:	\$39.93

Fiscal Years Ending Jul. 30	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
Increase in Shares Outstanding:	24	24	24	24	24	24	24	24	24	24
Average Strike Price:	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21	\$ 38.21
Increase in Common Stock Account:	916	916	916	916	916	916	916	916	916	916
Change in Treasury Stock	0	0	0	0	0	0	0	0	0	0
Expected Price of Repurchased Shares:	\$ 39.93	\$ 42.90	\$ 46.09	\$ 49.52	\$ 53.21	\$ 57.16	\$ 61.42	\$ 65.99	\$ 70.90	\$ 76.17
Number of Shares Repurchased:	-	-	-	-	-	-	-	-	-	-
Shares Outstanding (beginning of the year)	4340.580184	4,365	4,389	4,412	4,436	4,460	4,484	4,508	4,532	4,556
Plus: Shares Issued Through ESOP	24	24	24	24	24	24	24	24	24	24
Less: Shares Repurchased in Treasury	-	-	-	-	-	-	-	-	-	-
Shares Outstanding (end of the year)	4,365	4,389	4,412	4,436	4,460	4,484	4,508	4,532	4,556	4,580

Cisco System

Valuation of Options Granted under ESOP

Current Stock Price	\$39.93
Risk Free Rate	1.14%
Current Dividend Yield	3.10%
Annualized St. Dev. of Stock Returns	39.08%

Range of Outstanding Options	Number of Shares	Average Exercise Price	Average Remaining Life (yrs)	B-S Option Price	Value of Options Granted
Range 1	2	6.94	2.80	\$ 29.90	\$ 60
Range 2	2	47.00	5.40	\$ 8.99	\$ 18
Range 3	100	38.66	4.35	\$ 10.41	\$ 1,041
Total	104	\$ 38.21	4.34	\$ 13.76	\$ 1,119.18

Cisco System

Sensitivity Tables

		Beta							
		68.44	1.08	1.10	1.12	1.14	1.16	1.18	1.20
Equity Risk Premium	0.0215	1,901.19	1,464.87	1,191.00	1,003.09	866.16	761.94	679.97	
	0.0315	219.43	208.39	198.37	189.25	180.90	173.24	166.18	
	0.0415	113.61	109.43	105.54	101.90	98.49	95.28	92.27	
	0.0515	75.28	72.87	70.59	68.44	66.40	64.47	62.64	
	0.0525	72.75	70.44	68.25	66.19	64.24	62.39	60.63	
	0.0535	70.37	68.15	66.06	64.07	62.20	60.42	58.73	
	0.0545	68.13	66.00	63.98	62.08	60.27	58.56	56.93	

		Pre-Tax Cost of Debt							
		68.44	1.98%	1.99%	2.00%	2.01%	3.01%	4.01%	5.01%
Risk Free Rate	0.84%	56.45	56.31	56.16	56.02	44.47	36.50	30.67	
	0.94%	56.28	56.14	56.00	55.86	44.36	36.42	30.61	
	1.04%	56.11	55.97	55.83	55.69	44.25	36.34	30.55	
	1.14%	55.95	55.81	55.67	55.53	44.14	36.26	30.49	
	1.24%	55.78	55.64	55.50	55.36	44.03	36.18	30.43	
	1.34%	55.62	55.48	55.34	55.20	43.92	36.11	30.37	
	1.44%	55.45	55.31	55.17	55.04	43.81	36.03	30.31	

		CV NOPLAT GROWTH							
		68.44	1.5%	2%	2.5%	3%	3.5%	4%	4.5%
WACC	6.06%	47.83	53.40	60.54	70.01	83.18	102.73	134.83	
	6.08%	47.59	53.10	60.16	69.50	82.47	101.67	133.03	
	6.10%	47.34	52.80	59.78	69.00	81.77	100.63	131.27	
	6.12%	47.10	52.51	59.40	68.51	81.09	99.61	129.56	
	6.14%	46.86	52.21	59.03	68.02	80.42	98.60	127.88	
	6.16%	46.63	51.92	58.66	67.54	79.75	97.62	126.25	
	6.18%	46.39	51.63	58.30	67.06	79.10	96.65	124.66	

		Pre-Tax Cost of Debt							
		68.44	1.98%	1.99%	2.00%	2.01%	3.01%	4.01%	5.01%
Beta	1.08	75.37	75.34	75.31	75.28	72.54	69.97	67.57	
	1.1	72.95	72.92	72.89	72.87	70.28	67.85	65.57	
	1.12	70.66	70.64	70.61	70.59	68.14	65.85	63.69	
	1.14	68.51	68.48	68.46	68.44	66.12	63.95	61.89	
	1.16	66.47	66.45	66.42	66.40	64.21	62.14	60.19	
	1.18	64.54	64.52	64.49	64.47	62.39	60.43	58.57	
	1.20	62.71	62.69	62.66	62.64	60.67	58.80	57.03	