



Business Description

Apple, Inc. (AAPL) is a technology company founded in 1976 that specializes in consumer electronics. Their revenues are primarily derived from their hardware, software, and services segments. Apple’s hardware product line includes smartphones (iPhone), tablets (iPad), personal computers (Mac), television boxes (Apple TV), and smartwatches (Apple Watch). All of Apple’s devices run on their state-of-the-art software operating system, known as iOS. Their services segment is comprised of App Store and licensing sales, as well as some subscription-based services such as Apple Music. While Apple integrates its own software in its devices, it has contracts with multiple hardware suppliers, most notably Qualcomm (QCOM), for its semiconductors and other device parts. Apple’s products are sold internationally online, through its 500+ company-owned Apple Stores, and other third-party retailers.

Industry Overview and Competitive Positioning

Midwestern soil is renown for its deep black color and fertile properties. In the 1930s, innovative agricultural efforts had introduced new soil-preservation techniques. However, farmers were content with the traditional and cheaper methods that began to erode the rich soil and eventually resulted in the Dust Bowl, a phenomenon that destroyed the agricultural market and ultimately exacerbated the Depression. For years, Apple’s “fertile soil” has been the iPhone but sales have started to erode recently as Apple has ignored alternative prospects in the PC market and expansionary opportunities abroad.

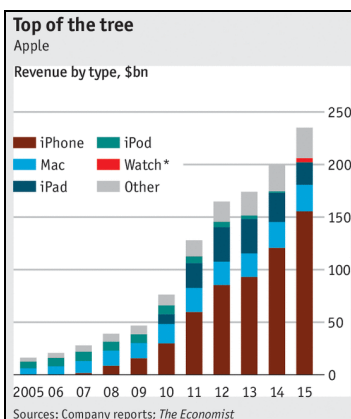
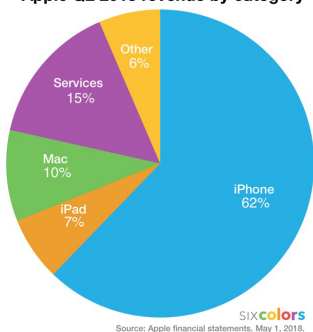
Technology industry is very cutthroat as established corporations wage a competitive war with high-potential upstarts. The tech titans, like Steve Jobs, mostly consist of former college students who had a brilliant idea and wrote a few lines of rudimentary code in their garage or dorm. Today, that model of succession lives on, and low costs of entry with significant economies of scale make the threat of new entrants a primary concern. Firms pour billions of dollars into marketing and R&D in return for a short time in the spotlight and marginal improvements. Apple’s biggest competitors are firms in the hardware field producing smart devices like Samsung, Google, Microsoft, and Huawei. These firms prioritize low cost structure whereas Apple utilizes its extensive moat to set a premium on many of its products. This approach, however, has made them suffer recently as their market share in smartphones has shrunk from its 2012-2015 highs. Apple’s clientele consist of individuals, small- and medium-sized businesses, and governments. As a result, Apple’s revenues are heavily tied to consumer spending patterns, and the Fed’s credit squeeze may put their near-to-middle term revenues in jeopardy. Loosening austerity programs abroad, however, may balance a portion of this out as governments turn to Apple for their hardware and operating systems.

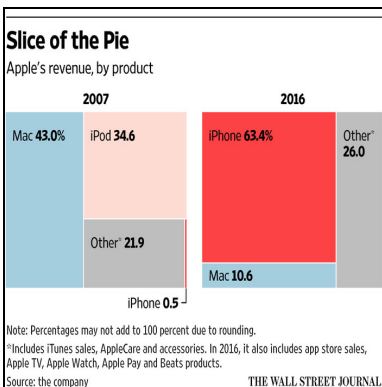
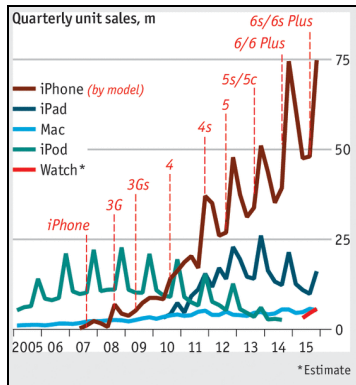
Apple’s position as an industry leader is not as solid as the market may believe as we have observed diminishing marginal improvements on the hardware and software components of their products. Firms like Apple often have one brilliant product - the iPhone - but improvements upon that product will only go so far to bolster consumer sentiment and keep the company in the spotlight. 2016 saw dropping revenues as a result of a lack of significant updates and releases for Apple products. That, coupled with the time constraints of an industry where a few months make the difference between revolutionary and obsolete and a lackluster iOS 12 update, puts Apple’s lead in question. The silver lining is that Apple has an established and loyal consumer base. Apple has built a moat by successfully propagating the belief that their products are the standard and irreplaceable. Marginal differences in rival devices make switching costs inexpensive but

Recommendation Guidance	
Target Price	\$212.00
Downside	3%
Recommendation	HOLD

Key Statistics	
Closing Price	\$215.50
Yield	1.24%
Forward P/E	16.3x
P/B	9.2x
ROIC (TTM)	22.9%
Tax Rate (TTM)	20.28%
Financial Leverage (TTM)	3.04
FCF (TTM)	\$58B
Revenue (TTM)	\$255B

Apple Q2 2018 revenue by category





inconvenient enough to ensure sustained revenue through customer loyalty. After implementing strategic fixes this year, iPhone sales have reflected this revived consumer confidence as quarter sales were up 20% year-over-year¹.

Apple has survived a few scandals, the most recent of which was the battery scandal. They were releasing updates that purposely made older devices run slower in order to encourage a shift towards their newer, more expensive product lines. In an industry where many companies have succumbed to the threat of substitution, Apple has been the impenetrable fortress comfortably surrounded by a deep moat. Scandals like the battery scandal is equal to Apple draining their own moat, and that is not something Apple should want to see dry up.

We believe Apple's perceived device dominance is a classic example of Keynes' "castles in the air" theory, where investors are driving up price more so on sentiment without full consideration of all factors.. Apple's market share in the PC market has managed slow increases, but has shrunk in the smartphone market. Apple has never been a controlling concern in their device markets, but has maintained a minority share not exceeding 25%. Apple's market share within the PC operating system market was 12.5% in 2017 compared to industry leader Microsoft's 82.9%. Apple's revenues from PC sales were 11% of total net sales in 2017. Apple's market share within the smartphone market was 14.6% in 2017, compared with industry leader Samsung's 21.9%. iPhone sales were 62% of total net sales in 2017.

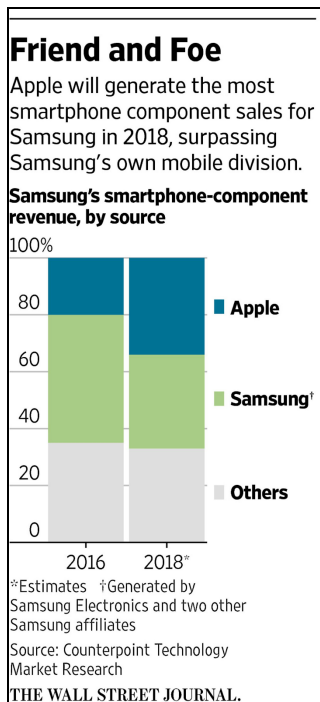
Apple is sensitive to volatility in their supply chain as the industry often seems shortages of crucial components, driving the price up even further. They outsource a lot of their manufacturing to Asian countries. However, there is a lot of competition in their supplier market, and this mitigates the risks of shortages and late or sub-par components.

Our guidance on Apple's current strategy is a heightened focus on improving iPhone sales by accelerating the release of newer additions with slight variations and add-ons in order to boost average selling prices with a more expensive product line. A strengthening dollar is also going to hurt them as they saw gains in Europe but a steep decline in their Greater China segment in 2017. 2018 has been stronger for them as they have seen four consecutive quarters of growth, most recently up 19% during the quarter year-over-year, in response to popular releases. They will be releasing more updates with pertinent features and betting on a weaker dollar in the future to continue this momentum. Upon reflection of the industry and current economic factors at play, we are setting our time horizon at 12-24 months before the investment would require a thorough revaluation.

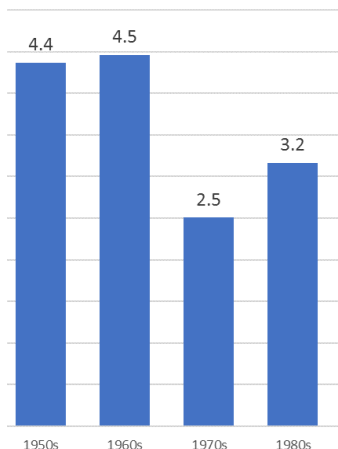
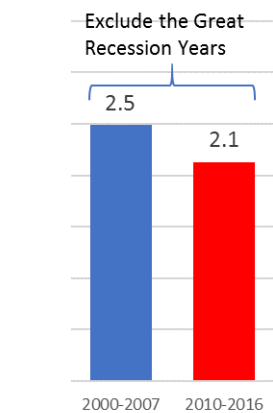
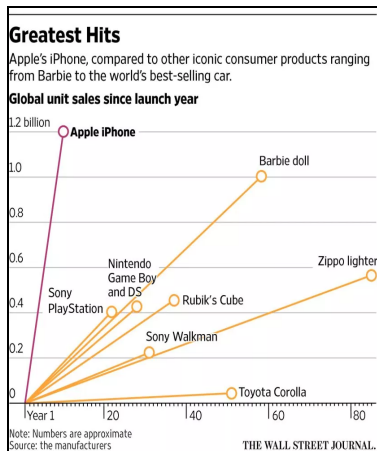
Valuation & Financial Analysis

Recommendation - Using a discounted cash flow analysis, we value AAPL at **\$212** after a Monte Carlo simulation accounting for a number of variables and assumptions. We are initiating a **HOLD** recommendation for Apple relative to their current market price of \$218, representing a 3% downside from our target price. Ultimately, we think that Apple is, in the words of value-investing titan Warren Buffet, a "wonderful company at a fair price" as opposed to a "fair company at a wonderful price". While a strong holding for a portfolio, current market prices do not give investors a sufficient margin of safety to justify an initial entry point into the stock.

Apple's robust free cash flow has been the primary driver of stock appreciation for the majority of their existence in the public markets. Dividends have only recently become a tool for



¹ <https://seekingalpha.com/article/4192790-apple-aapl-q3-2018-results-earnings-call-transcript?part=single>



U.S. GDP Growth
Source: FRED

management to return cash to shareholders, though they still rely heavily on share buybacks and internal reinvestment. Payout ratios still hover around a mere 25%, making dividend yields relatively low, thus giving investors little incentive to purchase Apple for dividends alone.² Reinvestment and share buyback programs, on the other hand, continue to dominate the corporate growth strategy. Multiples analysis is not as relevant here, either, since P/E, P/B, P/CF, and EV/EBITDA are all at 5-year highs for Apple, which reiterate our hold thesis.³ The entire industry also continues to run hot as the technology sector has propelled the majority of growth in the major American stock indices. This approach to growth makes a discounted cash flow model the most appropriate for valuing Apple.

1. Establishing High Growth Rates - Trailing-twelve-month cash flow growth sits at 15.5%, with an accompanying 7 year CAGR (compound annual growth rate) from 2010 to 2017 yields a 17.5% growth rate. The product of current ROIC and Reinvestment Rate gives us 17.5% in growth.⁴ Flatlining revenues and inconsistent cash flow growth signal a stagnation in the effectiveness of some of Apple's products and strategies. In order to account for the maturation of Apple's product lines and business units, we have established 2 periods of high growth for the model; the first two years are assigned a discounted 12% rate from the 15.5%-17.5% range established from surface level growth rates, and the subsequent 3rd year is assigned a further tapered 10% growth rate. In order to account for deviations in our assumption, we assigned a lognormal distribution function to both periods of growth; the first includes a mean of 12%, minimum of 5%, and standard deviation of 2%. The second assumes a mean of 10%, minimum of 5%, and standard deviation of 1.5%. A lognormal distribution within this range gives the assumption a right-skew to account for possible deviations upwards towards aforementioned growth rates before discounting (more so in the former period as opposed to the latter period), while also establishing a lower bound limit on growth predictions. Both variables are positively correlated 15%, implying that positive growth in one period will likely coincide with positive growth in the other (and vice versa). Customer reliance on Apple products and ancillary services will ensure continued growth within these conservative yet earnest parameters.

2. Terminal Rates - Our terminal growth rate assumes a BetaPERT distribution a mean of 2% for our base case, with a minimum of 1.5% and a maximum of 2.5%. U.S. GDP growth following the financial crisis in 2007-2008 has, in general, hovered within these bounds around the 2% mean, and has never trended as high as it was prior to the recession. Even for a large-cap core company like Apple, we want to assume a conservative and realistic growth rate for our period of perpetuity to ensure a reasonable long-term perspective of its growth prospects.

3. Taxes - We use Apple's 2017 effective tax rate of 20.2% for our base case scenario, but also add a BetaPERT distribution with a maximum of 25% and minimum of 15% for a diligent check of the model's sensitivity to this factor.

4. Risk-Free Rate - In a period of monetary tightening, we have factored in rising rates as a major pricing mechanism to the final price target in the model. Here, the BetaPERT distribution is used again with a mean of 3.5%, minimum of 3%, and maximum of 4.75%. With 10-year yields at 3%, continued tightening indications from the Federal Reserve, and steady, robust domestic economic prosperity, these higher initial assumptions account for the likelihood of

² Morningstar

³ See Appendix E,

⁴ Morningstar

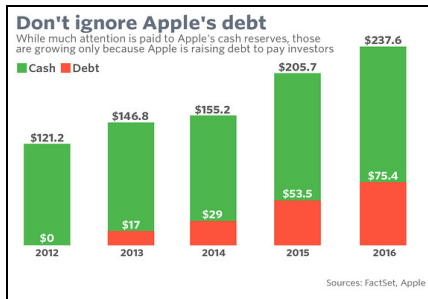


rates hikes in the short and long-term future. We are operating under the assumption of one more hike in September and two more in 2019, reflecting the consensus of the Board of Governors. A 3.5% mean gives us a 50 basis point margin of safety from current rates in the middle of a tightening cycle, and a 4.75% maximum gives us an upper bound for a potential pre-recession rate environment in the longer-term (as seen last in 2007).

	Cash Flow	ROIC* Reinvestment
TTM	15.5%	17.5%
CAGR	17.5% (7 yr)	-

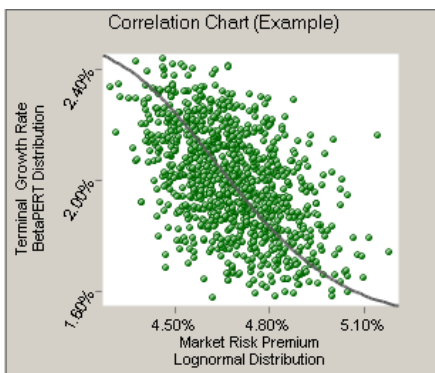
5. Market Risk Premium - For the MRP, a turn to bearish sentiment in the markets is accounted for in the discounted cash flow model. The base case mean is 4.68%, the implied premium in September 2018 according to Dr. Aswath Damodaran of NYU’s Stern School of Business.⁵ However, the standard deviation sits at 0.45% to create a right-skew distribution in the event of recession. In 2008 we saw the MRP in American equity markets increase to a lofty 6.92%. More than any other variable in the model, this assumption takes into account the current timing of the business cycle, which is currently in its longest bull market run in market history. Our intent is not to be doomsayers of market turmoil, although we think it is crucial to remember and understand that like all bull markets, this one too must come to an end. The natural ebb-and-flow of the business cycle and capital markets is often out of the government’s or monetary body’s control; the motive behind this assumption is simply that when markets turn, stocks on aggregate will decrease in price and value.

6. Net Debt - Apple has seen a rapid increase in both short-term and long-term debt since 2013. The 5-year CAGR for LTD is 41%, and the 4-year CAGR for STD is 30%. Management has also announced that in conjunction with the new tax treatment of repatriated earnings, they intend to decrease their massive cash holding through share buybacks and reinvestment. For our model, we assume a 20% YOY increase in LTD from 2017, a 15% YOY increase in STD, and a 15% decrease in cash. This brings net debt from a current level of \$85B to \$121B under these conditions. Under the BetaPERT distribution, the mean is \$121B, the minimum is our current \$85B, and the maximum is \$141B (net debt under 41% LTD growth, 30% STD growth, and 15% cash reduction).



7. WACC - Although most of the cost of capital sensitivity in this particular model is derived from the aforementioned factors of the risk-free rate and market risk premium, we still assess the WACC for impact on final share price target. Our base case WACC of 8.2% is derived from the after-tax market value of debt times its respective weight, plus the CAPM (where beta = 1.2, an aggregate of Reuters, Yahoo! Finance, and NASDAQ) multiplied by the respective weight of equity. The base case risk-free rate and market risk premium from earlier are also used here. Our minimum is 7.5% and our maximum is 9.5%.

8. Correlations - Along with the positive correlation between high growth rate years, we also assigned correlations to both the market risk premium and the terminal growth rate relationship (correlation = -0.5), as well as the market risk premium and net debt relationship (correlation = 0.5). We can reasonably assume that as the market risk premium increases, long term economic growth suffers as a result, leading to a decrease in the macroeconomic terminal growth rate. Additionally, under the theoretically poor market conditions, net debt will increase in an effort to prop up cash flow in spite of likely decreasing revenues and net income. For capital, management would both burn through their cash pile, and potentially take on more debt in the short term to maintain normal business operations.



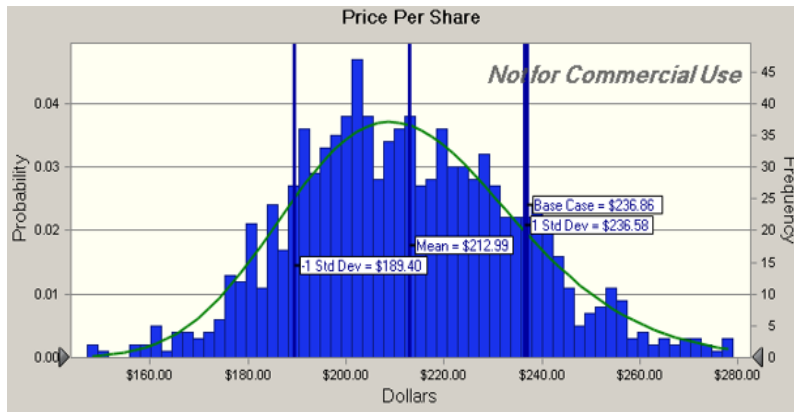
⁵ <http://pages.stern.nyu.edu/~adamodar/>



Simulation

After running 10,000 trials, the Monte Carlo simulation yielded a no-risk base case of \$236 considering the 2017 free cash flow to firm of \$58.5B. After statistical adjustments for our assumptions, the simulation yielded a mean target price of \$212, with a standard deviation of \$23.

Sensitivity of the model is concentrated in the high growth of period 1 at a positive 22.3% impact on the share price, followed by the terminal growth at a +20.4%. The WACC has a negative impact of 20.3%, and the market risk premium comes in next with a -15.3%. The sensitivity of other assumptions can be seen in the appendix, both from the Monte Carlo breakdown, and the base case relationship between WACC and growth rates.⁶



Financial Analysis

While still an industry-leader in margins, Apple’s gross and operating margins have slipped from lofty heights in 2012 of 44% and 35%, respectively, to TTM figures of 38%

and 26%.⁷ They have maintained consistent margins since this drop off, though, all while continuing to employ their premium pricing strategy. EPS growth has held considerably steady even through a rough 2016 where iPhone sales decreased for the first time in their revolutionary history. Over the past 7 years, EPS has grown at a CAGR of 23%.

Capex continues to be on the rise in the midst of an exceptional economy where companies are spending more on aggregate, mostly thanks to 2017 tax cuts in the US; AAPL has expended 14.5B in the trailing twelve month period compared to \$9.8B as recently as 2014 (CNBC). Research and development, the core of any technology company, has risen to 13.5B in the trailing twelve month period. This is nearly a 70% increase since 2015 as management pumps significant amounts of capital into new industries outside their core product lines.

Share buybacks as a means of returning capital to shareholders will continue to be an effective strategy for management. An additional \$100B on top of the existing \$300B program will propel this existing strategy. The growth nature of Apple limits their appetite for dishing out dividends, though dividend growth has been steady nonetheless; since their initial distribution in 2012, dividends have grown at a CAGR of 36%, an impressive pace for a company that continues to reinvests most of their income.⁸ Year over year EPS growth has been fairly inconsistent, though in 2017 we saw respectable growth of 10.8%, and Apple has done it’s best to smooth the cyclicity in the face of revenue and net income declines.

Apple’s main concern moving forward is the rapid growth of their debt and the resulting increase in key financial ratios as seen on the left hand side.⁹ These factors were accounted for in our valuation model as mentioned above. As Apple continues to pursue significant growth, management needs to tread lightly and ensure that the balance sheet stays clean and supported by cash flow and revenue growth.

Key Ratios (2017)	
Current Ratio	1.28
Quick Ratio	1.09
Leverage	2.80
Debt/Equity	0.73

⁶ See appendix G, I

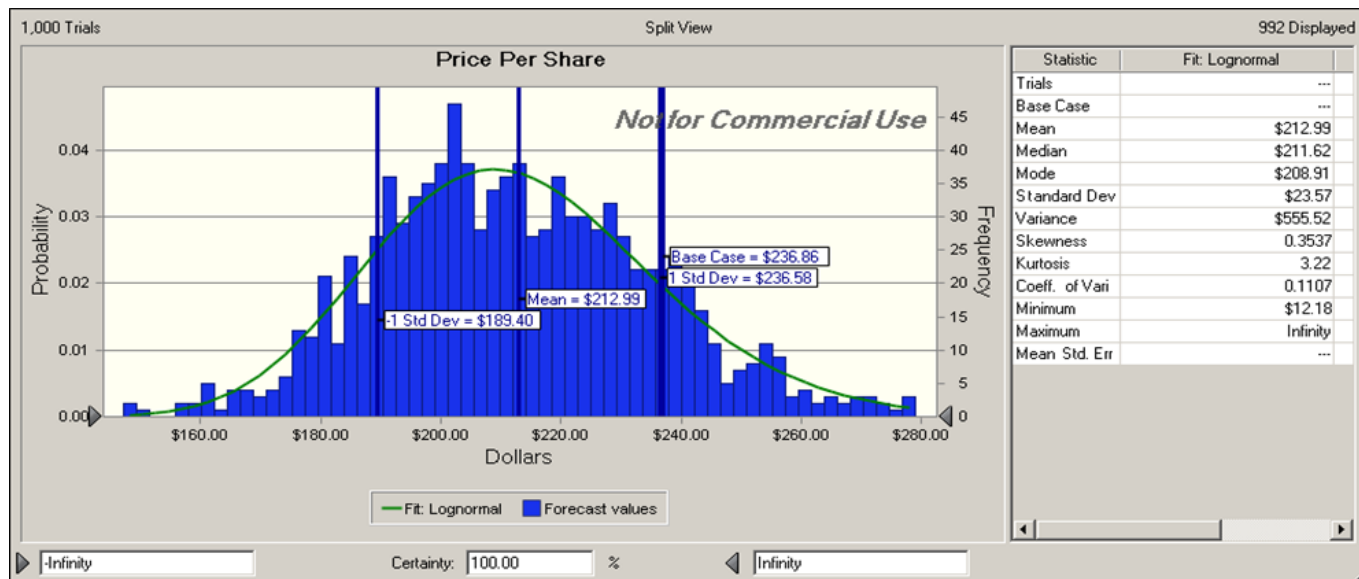
⁷ See appendix B, F

⁸ See Appendix D

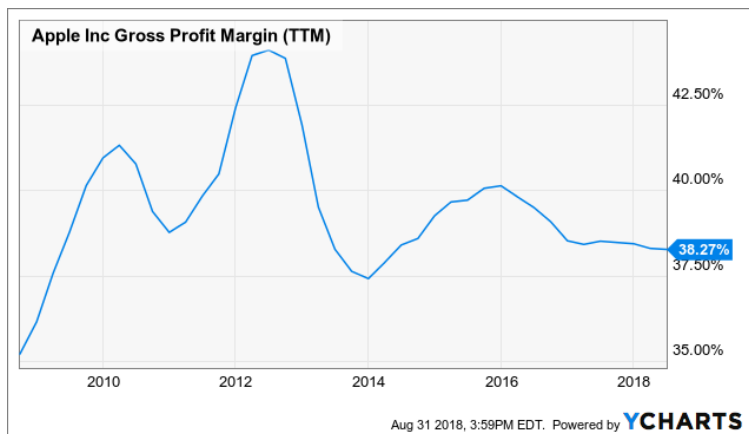
⁹ See appendix C, F



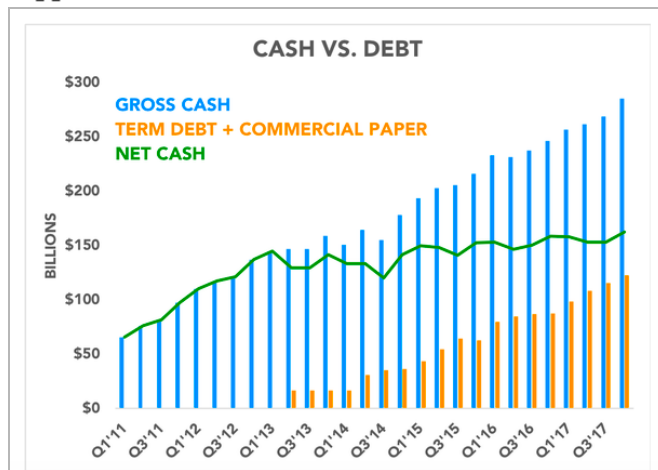
Appendix A



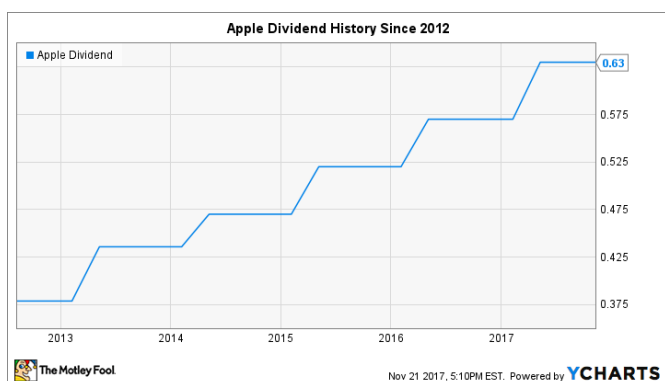
Appendix B



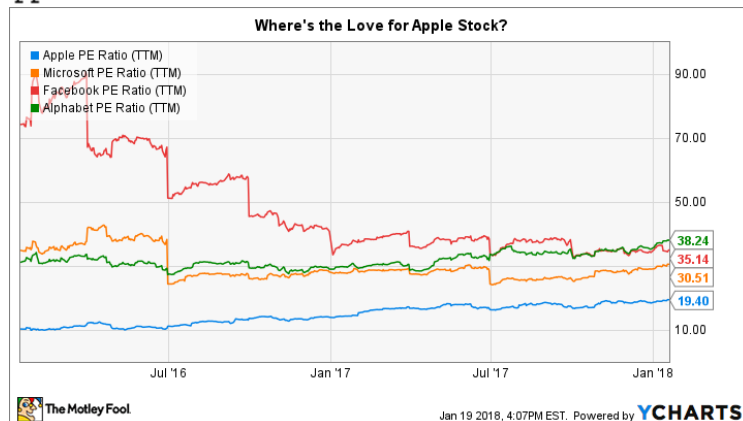
Appendix C



Appendix D



Appendix E





Appendix F

	Stock	Ind Avg	Relative to Industry
Price/Earnings TTM	19.7	18.5	<div style="width: 10%; background-color: red;"></div>
Price/Book	9.2	6.9	<div style="width: 33%; background-color: red;"></div>
Price/Sales TTM	4.3	3.1	<div style="width: 39%; background-color: red;"></div>
Rev Growth (3 Yr Avg)	7.8	4.3	<div style="width: 81%; background-color: green;"></div>
Net Income Growth (3 Yr Avg)	7.0	9.1	<div style="width: 23%; background-color: red;"></div>
Operating Margin % TTM	26.6	22.5	<div style="width: 18%; background-color: green;"></div>
Net Margin % TTM	22.0	17.1	<div style="width: 28%; background-color: green;"></div>
ROA TTM	16.2	11.3	<div style="width: 44%; background-color: green;"></div>
ROE TTM	45.4	37.8	<div style="width: 21%; background-color: green;"></div>
Debt/Equity	0.8	0.6	<div style="width: 33%; background-color: red;"></div>

- Avg +

Appendix G

Sensitivity Table (Growth rate is on the x-axis and discount rate is on the y-axis)								
\$ 236.62	-5.0%	-2.5%	0	2.5%	5.0%	7.5%	10.0%	
7%	226.72	233.21	239.69	246.18	252.67	259.15	265.64	
7.50%	212.97	219.10	225.22	231.35	237.47	243.60	249.72	
8.00%	201.52	207.34	213.16	218.99	224.81	230.63	236.46	
8.50%	191.82	197.39	202.96	208.53	214.10	219.66	225.23	
9.00%	183.52	188.86	194.21	199.56	204.91	210.26	215.61	
9.50%	176.31	181.47	186.63	191.79	196.95	202.11	207.27	
10.00%	170.01	175.01	180.00	184.99	189.99	194.98	199.98	
10.50%	164.45	169.30	174.15	179.00	183.84	188.69	193.54	

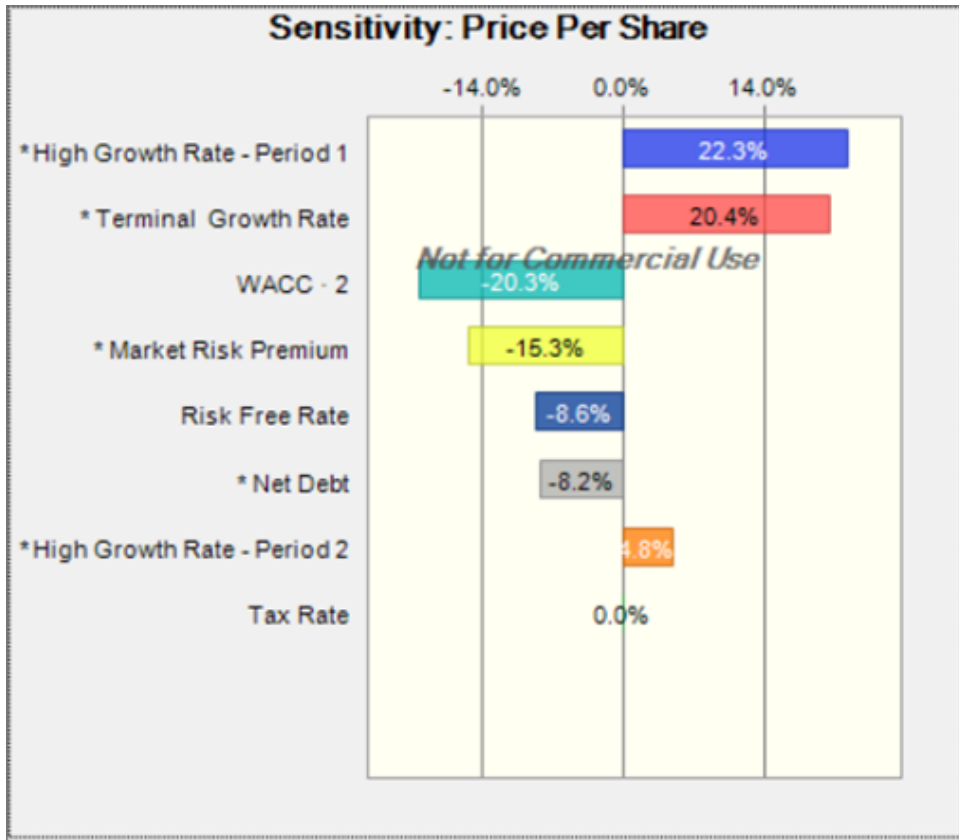
*sensitivity based on base case scenario of \$236 per share.

Appendix H

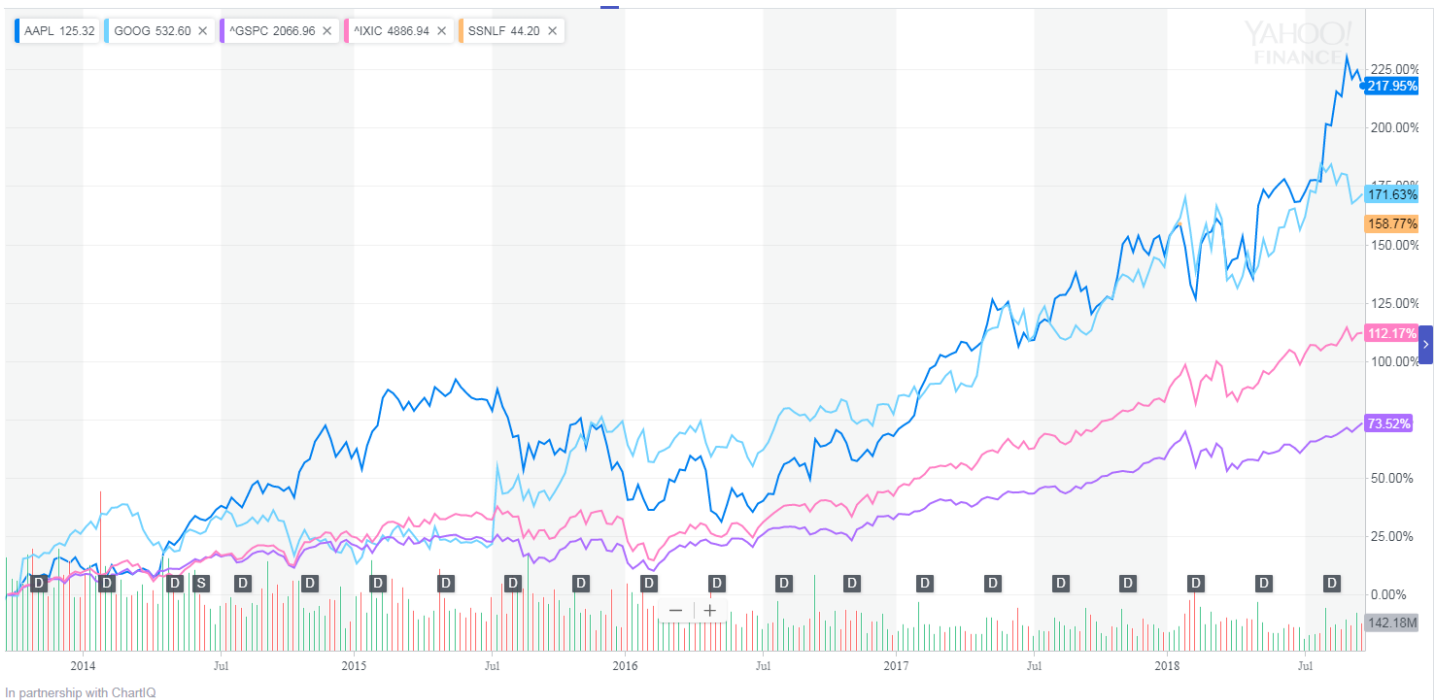




Appendix I



Appendix J



*AAPL vs competitors and indices; AAPL in dark blue, GOOG in light blue, Samsung in yellow, NASDAQ in pink, and the S&P 500 in purple.



Appendix K

iPhone

The following table presents iPhone net sales and unit sales information for 2017 , 2016 and 2015 (dollars in millions and units in thousands):

	2017	Change	2016	Change	2015
Net sales	\$ 141,319	3%	\$ 136,700	(12)%	\$ 155,041
Percentage of total net sales	62%		63%		66%
Unit sales	216,756	2%	211,884	(8)%	231,218

Source: <http://investor.apple.com/investor-relations/sec-filings/default.aspx>

Sales Data

The following table shows net sales by operating segment and net sales and unit sales by product for 2017 , 2016 and 2015 (dollars in millions and units in thousands):

	2017	Change	2016	Change	2015
Net Sales by Operating Segment:					
Americas	\$ 96,600	12 %	\$ 86,613	(8)%	\$ 93,864
Europe	54,938	10 %	49,952	(1)%	50,337
Greater China	44,764	(8)%	48,492	(17)%	58,715
Japan	17,733	5 %	16,928	8 %	15,706
Rest of Asia Pacific	15,199	11 %	13,654	(10)%	15,093
Total net sales	\$ 229,234	6 %	\$ 215,639	(8)%	\$ 233,715

Net Sales by Product:

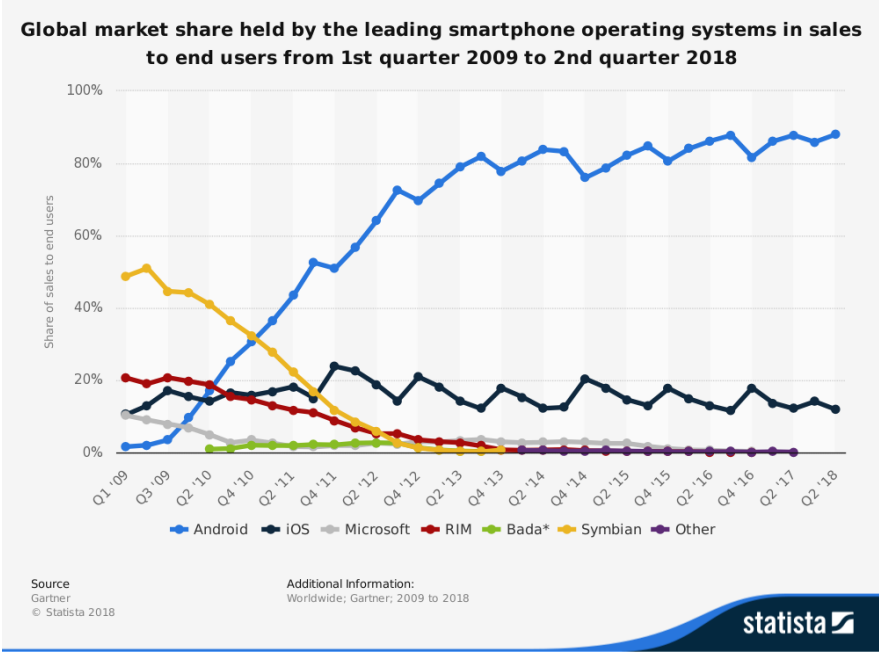
iPhone (1)	\$ 141,319	3 %	\$ 136,700	(12)%	\$ 155,041
iPad (1)	19,222	(7)%	20,628	(11)%	23,227
Mac (1)	25,850	13 %	22,831	(10)%	25,471
Services (2)	29,980	23 %	24,348	22 %	19,909
Other Products (1)(3)	12,863	16 %	11,132	11 %	10,067
Total net sales	\$ 229,234	6 %	\$ 215,639	(8)%	\$ 233,715

Unit Sales by Product:

iPhone	216,756	2 %	211,884	(8)%	231,218
iPad	43,753	(4)%	45,590	(17)%	54,856
Mac	19,251	4 %	18,484	(10)%	20,587



Appendix L



Source:

<https://www.statista.com/statistics/266136/global-market-share-held-by-smartphone-operating-systems/>

Appendix M

