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The Wall Street Gap: A Theoretical Analysis of Company Valuation Discrepancy

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Abstract

Examination of prior research suggests that affiliated sell-side analysts are subject to conflicts of interest that cause them to issue optimistically biased stock recommendations for investment banking clients. Using a sample of public technology companies, I find that analysts have a theoretical discrepancy of up to 26% when valuing companies using a discounted cash flow model, and a 19-22% theoretical discrepancy when using comparable company analysis. I showcase how conventional valuation methodologies can allow sell-side analysts significant leeway that can be used to further unethical agendas and draw conclusions around the usefulness of regulatory intervention in the financial services industry.

Keywords

Investment Banking, Ethics, Analyst, Valuation, Wall Street

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I. Introduction

A long history of sell-side analyst bias towards affiliated investment banking clients finally prompted regulatory action headed by State Attorney General Elliot Spitzer in late 2002 after investor community outcry amid the 2000 stock market crash (Pinedo, 2015). This article will begin by examining prior literature that investigates affiliation bias in sell-side analysts before these regulations were imposed to determine whether a conflict of interest problem was prevalent in the financial services industry. I will then test the hypothesis that additional regulation is the solution to temper conflict of interest issues by comparing these findings to those after regulatory enforcements. This will lead to exploring ways affiliated analysts are hypothetically able to manipulate conventional valuation models to justify artificially optimistic stock rankings for investment banking clients without compromising their reputation with inaccurate earnings per share (EPS) estimates.

The case study section of this article provides a theoretical simulation of how an affiliated analyst could conceal optimistically biased company valuations without altering EPS forecasts. I attempt to simulate findings of previous research to quantify the theoretical amount of justifiable valuation leeway analysts may have using the two primary valuation methodologies. It is obvious that valuation models can be adjusted to alter outputs, therefore I specifically focus on altering only objective variables that are based on irrefutable market data, such as varying the historical durations used to calculate risk-free rate and market risk premium. This creates a hypothetical environment in which valuation discrepancy is not only reasonable, but supported by justifiable methodologies. This environment can be used to calculate the theoretical discrepancy analysts may have in company valuation. Case study findings are representative of analysts' internal company valuations used to justify stock recommendations, not the actual stock price changes that result from their behaviors.

This is an important ethical issue to study because even though analysts do not have a direct influence on stock prices, they are considered specialized experts on particular companies. Therefore, the investor community often takes their recommendations seriously, prompting them to buy or sell accordingly, which in turn will impact stock prices (Loh & Stulz, 2011). Even though several analysts

often cover prominent stocks, investors receive a disproportionate amount of research from sell-side analysts with investment banking ties. This is due to the fact that affiliated analysts issue recommendations sooner and unaffiliated analysts discontinue stock coverage in proportionally greater numbers, causing analysts that are most likely to be biased to have significantly greater influence on investor perception (O'Brien, McNichols, & Lin, 2005).

A. Background

It is common for people to confuse the variety of positions in finance that are referred to as analyst. This article references the sell-side analyst. Sell-side analysts conduct equity research at brokerage firms. Brokerage firms serve as intermediaries for buying and selling securities for pension funds, mutual funds, and other large institutions as well as individual clients. The analyst's primary role is to review stocks and conduct supporting research, which is available to clients who use the information to make investment decisions.[1] This expertise is also provided to potential clients, and often the investing public, to incentivize them to trade on their platform. Most brokerage firms have investment banking divisions, which provide advisory for capital raising, mergers and acquisitions (M&A), and other corporate finance transactions. The relationship between the two arises from clients viewing strong research capabilities as a signal that a firm has expertise to provide admirable investment banking services (Newsome, 2005).

II. Prior Research

A. Ethical Issues Prior to Global Settlement Regulations

Sell-side analysts are often faced with ethical dilemmas as they have the fiduciary duty to provide unbiased stock recommendations to the investing public, but also to create maximum value for their firm and corporate clients. Because their compensation is tied to firm profits, analysts' ethical duties to the public can be overshadowed by the desire to win future investment banking clients and to maintain beneficial relationships with current clients, prompting analysts to artificially manipulate specific company analysis in their favor.

Contrary to conventional belief, the practice of issuing optimistically biased recommendations to specific stocks does not entice the corresponding companies to pursue advisory from the analyst's investment bank. Studies by Ljungqvist,

[1]Analysts often rank stocks using a 3-tier rating system with "buy," "hold," and "sell" categories. They also set specific earnings per share (EPS) expectations.

Marston, and Willhelm (2009) and Kolasinski and Kothari (2008) find that the generation of these positively skewed reports does not increase the probability of winning specific corporate clients. Another incentive for analysts to interject bias into their stock recommendations lies in promotion of existing investment banking clients. This unethical motivation will be the focus of this article as it yields clear results for investment banking clients and their advisors.

Before discussing literature in support of this phenomenon, it is important to examine whether these actions are motivated by selection bias or conflict of interest because it will help determine whether regulations will be impactful or not. Selection bias occurs when accurate selection of data is compromised by one's attitudes, behaviors, and beliefs ("Definition of selection bias," 2018). In the context of this article, the selection of data refers to various assumptions that drive company valuation. While this is not optimal, additional regulation will not be able to mitigate the effects of selection bias as it is often an inevitable and unavoidable aspect of our human nature. Conflict of interest differs from selection bias as it involves two different groups whose demands are at odds with one another (McCombs School of Business, 2018). Hence, a conflict of interest would occur if an analyst is encouraged to perform incompatible actions by two different groups of stakeholders. In theory, this ethical issue can be alleviated through government intervention by aligning the incentives of stakeholder groups, or by blocking the relationship between an analyst and a stakeholder group altogether.

Previous studies such as Dugar and Nathan (1995), Iskoz (2002), Lin and McNichols (1998), and Michaely and Womack (1999) imply an issue of selection bias around equity underwriter affiliation, but not necessarily a conflict of interest problem (Kolasinski & Kothari, 2008). The question of whether conflicts of interest are the driving factor of biased stock reporting is tackled by Kolasinski and Kothari (2008) and O'Brien et al. (2005).

Kolasinski and Kothari (2008) examine this in the context of M&A advisory, which accounts for the largest source of investment banking revenue. Their findings indicate that investment banking affiliation increases the odds that an analyst will upgrade the acquirer within 90 days of the M&A transaction by over 1.5 times in all cash deals.[2] In transactions that are financed with all stock, affiliation to the target increases the odds that an analyst will upgrade the buyer's stock by a factor of over two soon after, not before, the exchange ratio is fixed.[3] The significance of

[2]M&A transactions can be financed through any mixture of stock, debt, and cash (Rosenbaum, 2013).

[3]The target is the seller in an M&A transaction. When an M&A transaction is financed with stock, the most common price structure is a fixed exchange ratio, which is the ratio of the number of shares of the buyer's stock will be exchanged for each share of the seller's stock. The ratio is negotiated prior to public announcement of the deal, and remains fixed between announcement and closing.

upgrading the acquirer's stock after the exchange ratio is fixed is that artificially driving up the buyer's share price will create more valuable shares for a client (the seller), essentially forcing the buyer to pay a higher price for the deal than originally agreed upon. Both findings are unlikely to be the result of selection bias, and therefore support the authors' conflict of interest hypothesis. Further, after affiliated sell-side analysts upgrade their assessment of a given stock, they are reluctant to change their EPS projections, which is consistent with findings from Dechow, Hutton, and Sloan (2000) and Malmendier and Shanthikumar (2004). The hesitation around altering EPS forecasts could come from fear of affiliated companies missing earnings expectations, which also strengthens the conflict of interest theory.[4]

O'Brien et al. (2005) examine the conflict of interest hypothesis using IPO underwriting affiliation.[5] The study finds that sell-side analysts are significantly more likely to accelerate optimistic recommendations as well as delay pessimistic recommendations for investment banking clients, concluding that this is indicative of a conflict of interest problem. The hypothesis that these recommendations are indeed artificially skewed is underscored by the fact that affiliated analysts' recommendations consistently underperform compared to those by unaffiliated analysts (Michaely & Womrack, 1999*).* Kolasinski and Kothari (2008) believe the findings of O'Biren et al. (2005) can be explained as selection bias, but I disagree. While advisors do collect fees on IPO underwriting regardless of subsequent stock performance, they are still incentivized to issue optimistically biased ratings to drive up prices as investors often sue when newly public companies underperform. For example, a class-action lawsuit against 55 investment banks from the late 1990's stock market boom has forced firms to make exorbitant payouts, including $425 million from J.P. Morgan Chase (Dash & Anderson, 2006). Post-IPO stock performance will also impact a bank's reputation, and therefore their ability to win and retain clients in the future since reputation is one of the primary reasons corporate clients select investment banks (Rosenbaum, 2013).

B. The Global Analyst Research Settlement and Consequences

The issue of sell-side analyst conflict of interest and its effects on misleading the investor community became so prominent that it prompted the regulatory actions that occurred during the Global Analyst Research Settlement.[6] The settlement was between the Securities and Exchange Commission (SEC), the Financial Industry Regulatory Authority (FIRNA), the New York Stock Exchange

[4]EPS is the primary metric investors look at to evaluate company health. If a company announces earnings that are not in line with analyst expectations, the stock price will correct accordingly.
[5]IPO advisory is another significant source of revenue for investment banks.
[6]Commonly referred to as the "Global Settlement."

(NYSE) and the top ten investment firms.[7] Its 2003 finalization was designed to prevent the conflicts of interest discussed previously by separating investment banking and research departments physically as well as with "information firewalls" (Pinedo, 2015, p.1). In addition, budget allocation and collaboration between the two groups was prohibited (Pinedo, 2015).

This historical overhaul of the financial services industry was clearly necessary, but did it produce the desired alleviation of conflict of interest? A study by Carapeto and Gietzmann (2011) indicates that Global Settlement regulations have certainly reduced, but not closed, the gap between affiliated and unaffiliated sell-side recommendations in the ten banks that additional regulations were imposed upon. In addition, they found that these regulations had no impact in mitigating affiliation bias in firms not included in the settlement. Regarding specific actions of analysts, Kadan and Madureira (2009) find that the likelihood of issuing optimistic recommendations for clients has declined, although affiliated analysts are still reluctant to issue pessimistic reviews on clients' stocks. Furthermore, the added regulatory oversight has spooked many analysts into issuing less informative analyses attached to their recommendations, exhibited by many moving from a five-tier to a three-tier ranking system. Overall, these findings suggest that regulations have had some success in dissolving conflicts of interest in Global Settlement regulated banks, but at the expense of less informative recommendations for the investing public.

III. Case Study

A. Technical Justification Behind Biased Company Valuation

Affiliated sell-side analysts who formulate biased recommendations need to support their theses with quantitative analysis in the form of company valuation. The two primary valuation methodologies used by analysts are discounted cash flow (DCF) and comparable company analysis. The DCF is based on a number of assumptions, and involves projecting a company's future free cash flows and discounting them back to the present value using an appropriate discount rate.[8]

[7]Bear Stearns, Credit Suisse, Deutsche Bank, Goldman Sachs, J.P. Morgan Chase, Lehman Brothers, Merrill Lynch, Morgan Stanley, Salomon Smith Barney, and UBS Warburg.

[8]Unlevered free cash flow = [Earnings Before Interest and Tax * (1-tax rate)] + ΔNet Working Capital – Depreciation and Amortization – Capital Expenditures. The appropriate discount rate for unlevered FCF is the Weighted Average Cost of Capital (WACC).

Comparable company analysis applies average valuation multiples of similar companies to the sales or earnings metric of a target company (Rosenbaum, 2013).[9]

Florian (2010) and Damodaran (2001) discuss that the DCF is heavily subject to assumption bias. Even slight input adjustments can drastically alter valuation, making it possible to manipulate the outcome without making changes that would deviate from an economist's point of view. Florian (2010) believes that combining the DCF with market driven valuation methods (e.g. comparable company analysis) produces a fair and valid company value. However, I demonstrate that market driven methods can be just as vulnerable to hypothetical affiliation bias. By altering company screening criteria, analysts can manipulate valuation outputs to support their agenda. Findings from Paleari, Signori, and Vismara (2014) that groups of comparable companies selected by affiliated analysts justify valuations that are 14-34% higher compared to non-affiliates also supports this assertion.

B. Overview

One explanation for the reason that regulations such as those derived from the Global Settlement have only emerged relatively recently is that it is not always obvious that affiliated sell-side analysts are purposely making optimistically biased recommendations. The case study section of this article offers a theoretical demonstration of the technical justification behind biased company valuation. Specifically, I attempt to exhibit how altering seemingly insignificant inputs used to calculate a company's discount rate can be combined to significantly alter DCF valuation without EPS deviation and how minor adjustments in the process of selecting peers can be used to manipulate valuation output using comparable company analysis. This will take Florian's (2010) conclusions around manipulation of DCF outcome without deviation from an economist's point of view a step further by quantifying how these justifiable changes can impact company valuations. It will also support findings from Paleari et al. (2014) regarding the ability of analysts to skew company valuation in their favor using the comparable company method. It is important to note that company valuation is typically showcased as a range of values using sensitivity analysis.[10] The specific valuation outputs discussed represent the average of the range of values implied by sensitivity analyses for each case of each company, which are exhibited in the valuation football fields found in

[9]Peer companies are selected based on industry, financial profile, geography, business model, etc. The most common valuation multiples are Enterprise Value/Revenue, Enterprise Value/Earnings Before Interest Tax Depreciation and Amortization, and Price/Earnings.

[10] Sensitivity Analysis in a DCF would involve finding the range of values outputted across a range of discount rates, exit multiples, growth rates, and other drivers. Sensitivity Analysis in comparable company analysis involves finding the range of values implied across a range of valuation multiples.

Appendix B. In addition, the valuation outputs and market value discussed represent analysts' internal valuations used to issue recommendations, not the direct impact on stock prices.

C. Structure

This case study uses a sample of five prominent technology companies, each within different industry verticals.[11] To theoretically quantify the discrepancy sell-side analysts may have in company valuation, I compare "high" and "low" cases for each company using three methodologies: discounted cash flow, comparable company analysis using EBITDA multiples, and comparable company analysis using revenue multiples. I maintain consistent EPS forecasts across each case because findings of Kolasinski and Kothari (2008), Dechow et al. (2000), and Malmendier and Shanthikumar (2004), among others suggest that analysts who issue optimistically biased stock recommendations do not announce EPS forecasts that deviate from unaffiliated analysts. In addition, I provide my own rationalization behind each variable that is altered to demonstrate how the significant difference in the two cases could be justified in a real-world context (figures 1 and 2). By comparing the two cases, conclusions can be drawn regarding the specific discrepancies allowed in each methodology relative to company market cap.

1. Discounted Cash Flow

It is obvious that altering free cash flow projections would change valuation output and EPS forecasts, so this variable is held constant between the "high" and "low" cases.[12] For similar reasons, the implied perpetuity growth rate used in terminal value calculation is unchanged. While changes in these could theoretically be justified, I focus on altering discount rate inputs that are supported by undisputed market data, do not change EPS forecasts, and have justifications that can be applied universally (capital structure, cost of debt, risk-free rate, market risk premium, and beta). Each company is unique in the mix of inputs that produces the overall highest and lowest valuations. Regardless of the company, altering the individual assumptions below can be justified one way or the other. For example, using either peer or current capital structure both have supporting justifications that

[11]Adobe Systems, Lenovo, Nintendo, Qualcomm, and Zillow.

[12]For free cash flow projection, I used analyst consensus figures sourced from S&P Capital IQ for all revenue projections. For all other free cash flow inputs, I used generally accepted projection methods (Rosenbaum, 2013) guided by analyst equity research sourced from S&P Capital IQ. Perpetual growth rates were chosen based on long-term industry vertical outlook and implied EBITDA multiple. Company earnings not reported in USD were converted at a rate sourced from Google Finance.

can be applied universally. An explanation of each altered variable and the supporting justifications are shown in figure 1.

Figure 1. Discounted Cash Flow Assumptions and Supporting Justifications

	Assumption	Explanation	Justification
Discounted Cash Flow	**Current Capital Structure**	> Current capital structure is derived from a company's value of debt and equity in their most recent SEC filing.	> Current capital structure reflects the unique current state of a company, so it should be used.
	Peer Capital Structure	> Peer capital structure is derived from the average capital structure of comparable companies.	> Peer capital structure reflects the optimal levels of debt and equity for a company in its distinct competitive environment. Since DCF valuation assumes target company operation into perpetuity, peer capital structure should be used.
	Current Cost of Debt	> A company's blended yield of outstanding debt instruments in their most recent SEC filing is used to find current cost of debt.	> Current cost of debt reflects the unique current state of a company, so it should be used.
	Peer Cost of Debt	> Peer cost of debt is derived from the average blended yield of outstanding debt instruments of comparable companies.	> Peer cost of debt reflects the theoretical cost of debt that a company within a given industry will attain into perpetuity, so it should be used.
	30-Year Risk-Free Rate	> The 30-year risk-free rate is derived from the 30-year yield on the government bonds from the country in which a company reports its earnings.	> Since we are assuming the target company operates into perpetuity, bonds with a longer duration should be used to find the risk-free rate.
	10-Year Risk-Free Rate	> The 10-year risk-free rate is derived from the 10-year yield on the government bonds from the country in which a company reports its earnings.	> According to the Bureau of Business and Economic Research (2016), the average business cycle duration is approximately 6.9 years. The 10-year risk-free rate should be used as its maturity is more in line with this duration.
	Quarterly Expected Market Return	> The most recent quarterly expected market return is estimated by the Bloomberg Business Database.	> The quarterly expected market return is based on more recent market data and therefore should be used as it accurately reflects current market conditions in which a company is operating in.
	Annual Expected Market Return	> The most recent annual expected market return is estimated by the Bloomberg Business Database.	> The annual expected market return is based on a larger sample of market data and therefore should be used as it is accurately reflects conditions in which a company would operate in into perpetuity.
	Adjusted Beta	> The adjusted beta is a projected future beta for a company estimated by the Bloomberg Business Database.	> The adjusted beta reflects the unique level of systematic risk in which a company operates in and therefore should be used.
	Levered Beta	> The levered beta is derived from first unlevering the betas of comparable companies using their individual capital structures, then relevering the average of comparable unlevered betas using the target company's capital structure.	> The levered beta reflects the theoretical level of systematic risk a company will operate in into perpetuity based on their specific competitive environment and therefore should be used.

2. Comparable Company Analysis

By studying the competitive environment that each sample company operates in, I compile a list of comparable firms based on either financial profile or business model and apply both EBITDA and revenue based multiples to find the corresponding implied price per share. In the two methods, the pools of selected peer companies often overlap significantly. This makes sense as analysts often skew comparable company valuations by omitting or adding a small number of companies to their analysis. Similar to DCF inputs, the assumption that yields a higher or lower value varies across sample companies, but each assumption can be justified universally. Figure 2 provides supporting justifications for each screening methodology.

Figure 2. Comparable Company Analysis Assumptions and Supporting Justifications

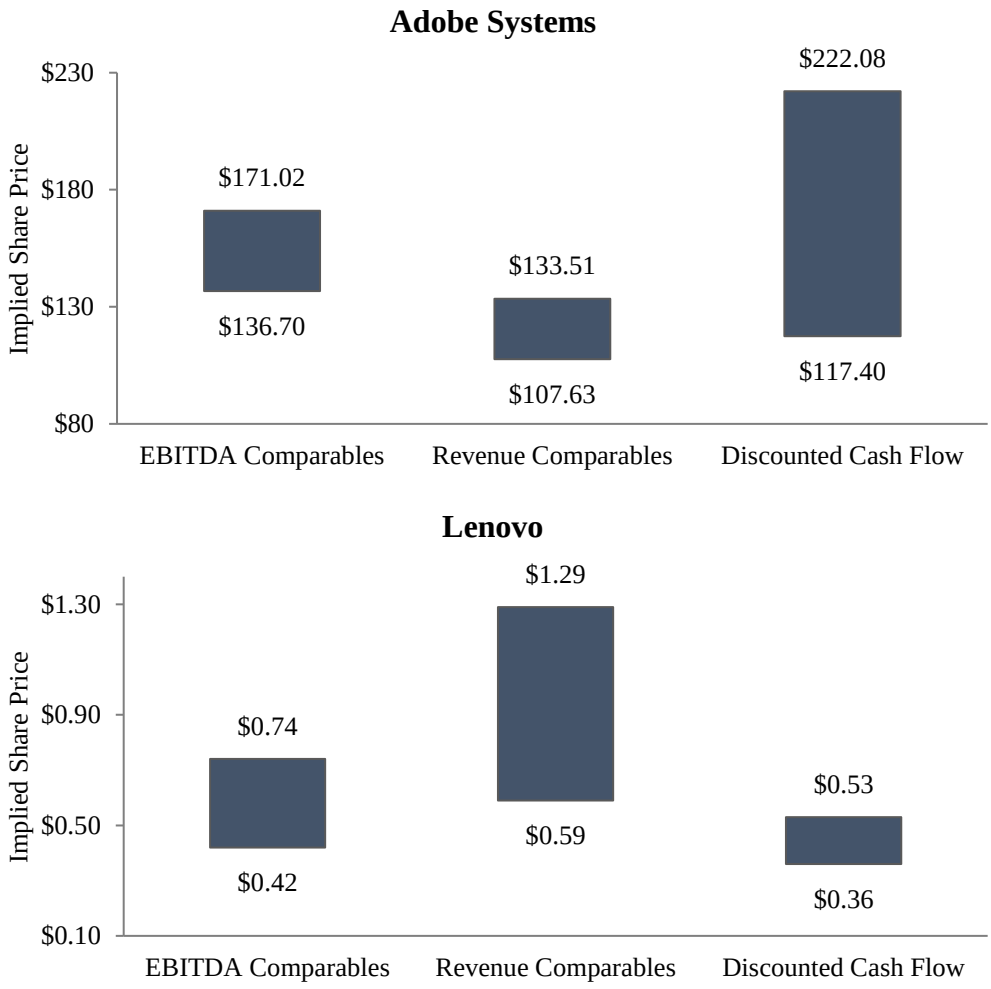
Assumption	Explanation	Justification
Screen by Business Profile	> Selecting comparable companies based on business profile involves analyzing the target company's proximity to competitors based on product or service offerings, sector, customers, distribution channels, etc. (Rosenbaum, 2013).	> Theoretically, companies with similar business profiles will have identical financial profiles into perpetuity. Further, business profile is what drives company financial profile, so this method should be used.
Screen by Financial Profile	> Selecting comparable companies based on financial profile involves analyzing a target company's proximity to competitors based on size, profitability ratios, growth profile, etc. (Rosenbaum, 2013).	> Selecting companies based on business profiles does not properly assess their systematic risk proximity, which is more accurately captured when selecting comparable companies using financial profile.

D. Findings

First, it is important to note some inconsistencies between valuation models in each case. In order to remain consistent with my approach of altering only justifiable inputs, I mitigated the discrepancies produced between cases when correlated outcomes were clearly unreasonable. For example, the comparable companies for Nintendo had significantly lower betas, therefore using their average in finding the company's relevered beta would be unjustifiable. To mitigate this, I used the 75th percentile instead of the average of peer unlevered betas. In addition, I relevered the 75th percentile using the average peer debt/equity ratio, since Nintendo has no debt. Other instances where a similar approach was necessary can be found in my valuation models in Appendix B. This approach of alleviating the impact of unreasonable outcomes, often referred to as a "sanity check," is common practice in the finance industry (Rosenbaum, 2013). Hence, doing so will arguably strengthen the real-world applications of my findings. Figure 3 below exhibits the

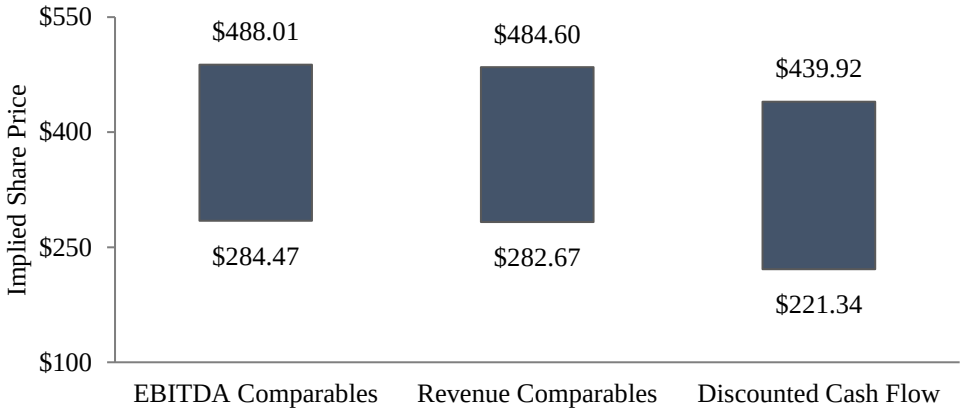
valuation outputs of each methodology resulting from both "high" and "low" cases for each company.[13] For example, the "high" case DCF of Adobe systems resulted in a $171.02 price per share, and the "low" case DCF in a $136.70 price per share. Sensitivity analyses for each case only rarely overlap and are provided in Appendix B.

Figure 3. Valuation Output Ranges

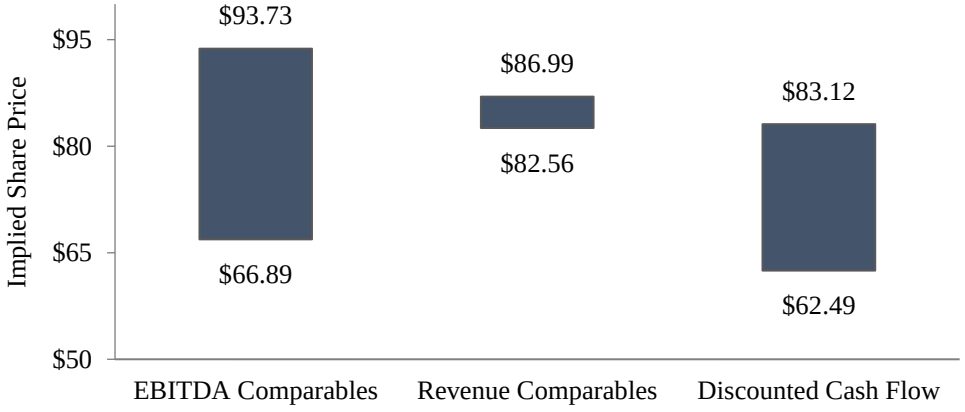


[13]The relatively high variance in the revenue comparables method can help explain why analysts primarily focus on EBITDA multiples in practice (Rosenbaum, 2013).

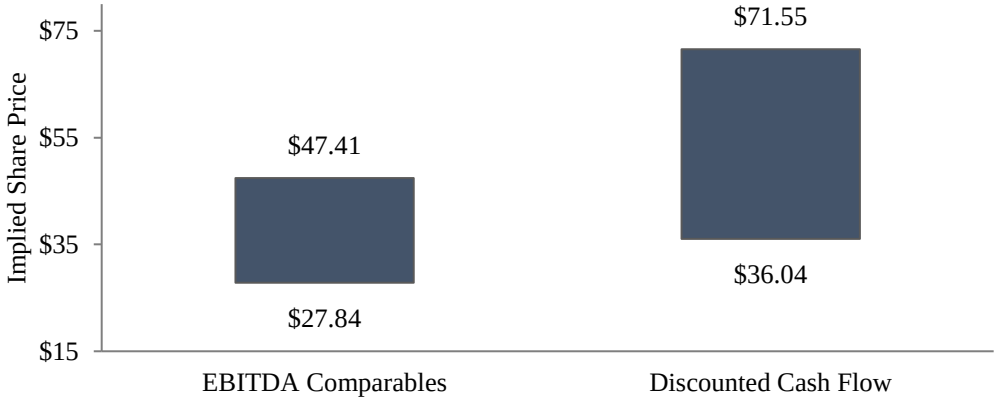
Nintendo



Qualcomm



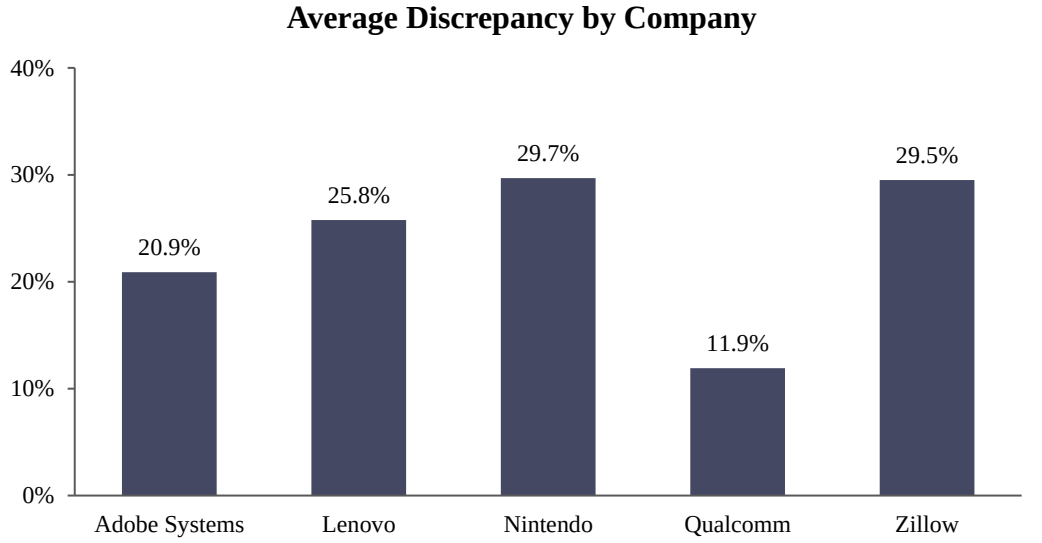
Zillow[14]



My discrepancy analysis (Appendix A) assumes that a "fair" valuation exists halfway between the "high" and "low" cases. This value represents the theoretical price per share an unaffiliated (unbiased) analyst might calculate. The percentage deviation from this "fair" value therefore represents the theoretical leeway, or discrepancy an affiliated (biased) analyst has while staying within the justifiable parameters previously discussed.

As demonstrated in the "Case Study Structure" section above, each assumption around a company's discount rate that is changed only alters individual inputs slightly, and can be undoubtedly justified. However, when used in combination to purposely attempt to skew company value, can have a momentous impact on the discount rate and therefore final valuation. As shown in the figure 4 below, toggling the discussed inputs allow for a 26.0% discrepancy in DCF valuation. This accounts for an over $136.8 billion variance in market value in only the five companies chosen for this study.[15] While the DCF does allow for the largest potential discrepancy, that of comparable company analysis (19.2-21.6%) is still significant, representing a $107.3 billion variance in market value in my sample pool. This finding refutes Florian's (2010) assertion that combining the two methodologies will produce a fair value.

Figure 4. Average Discrepancies



[14]Zillow's revenue comparables analysis produced a slightly higher "low" cash output, leading to its exclusion

[15]The dollar variance in market value is the range implied from: "fair" value ± (% discrepancy * "fair" value)

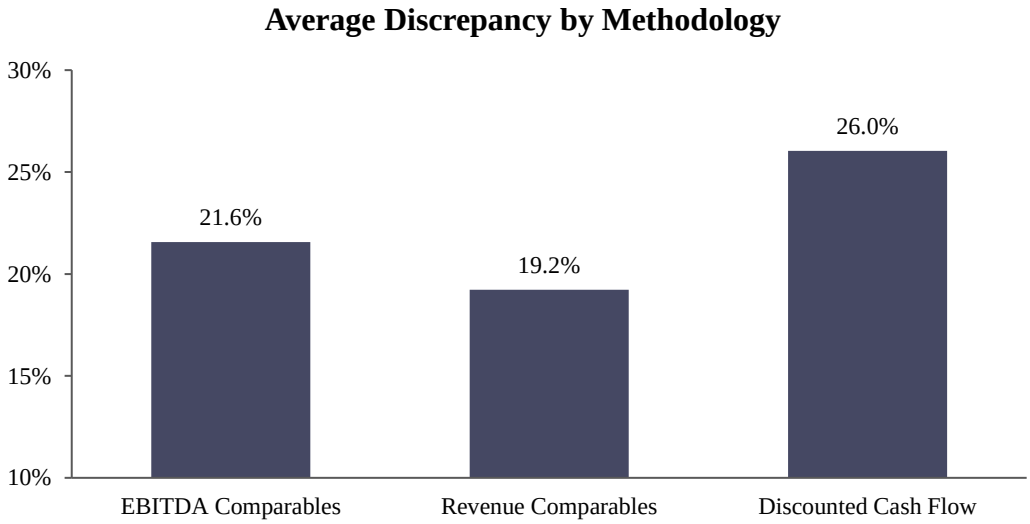


Figure 5 attempts to apply my findings to those of Paleari et al. (2014), who found that affiliated analysts choose comparable companies that imply a 13-38% higher valuation. By finding the average percentage discrepancy of the EBITDA and revenue comparable company methods and applying a 95% confidence interval range, I was able to mimic the outputs of Paleari et al. (2014). The results indicate that the comparable company valuation methodology can be used by affiliated analysts to justify a 12.2-30.0% higher valuation over what would be considered "fair" value. Even though my sample size was significantly more restricted and largely theoretical, the interval implied is surprisingly similar to Paleari et al.'s (2014). Unfortunately, there are no similar studies that use DCF valuation with which to compare my findings.

Figure 5. Application to Paleari et al. (2014)

Company	EBITDA Comps % Inc Discrepancy	Revenue Comps % Inc Discrepancy	Average % Inc Discrepancy
Adobe	11.2%	10.7%	10.9%
Lenovo	27.6%	37.2%	32.4%
Nintendo	26.3%	26.3%	26.3%
Qualcomm	16.7%	2.6%	9.7%
Zillow	26.0%	NA	26.0%

Mean	21.1%
Sample Standard Deviation	10.2%
Standard Error of the Mean	4.5%

95% Confidence Interval Range
12.2% - 30.0%

Analysts typically combine DCF and market driven methodologies to produce a final valuation range for a given company. Based on this study, the combined average discrepancy of the two methods is 23.2%.[16] When applying this discrepancy to the market value of companies in the S&P 500 Index, a whopping $11.1 trillion in market value can be justifiably manipulated in valuation models by analysts seeking to further their agenda.[17]

E. Limitations and Future Research

The most obvious limitation of this case study is its theoretical nature. In DCF valuation, affiliated analysts that issue biased recommendations can do so by altering discount rate assumptions using completely different methodologies than I have, or by simply adjusting the perpetual growth rate. Similarly, in comparable company analysis, a wide variety of screening methods could be used in addition to those discussed.

In both comparable company analysis and DCF valuation, current outstanding shares were used instead of fully diluted shares outstanding.[18] Using fully diluted shares outstanding would increase the number of shares used in both methodologies, therefore decreasing valuation outputs slightly across the board.

[16]The average of the two methods is found by taking the average of the two comparable method discrepancies and the DCF method discrepancy. For example, the Excel function would be =Average(Average(EBITDA Comps, Revenue Comps), DCF).

[17]Based on a $23.9 trillion S&P 500 market cap sourced from Google Finance (2017).

[18]Fully diluted shares outstanding account for the dilutive effects of options, warrants, and convertible securities.

Next, the historical cash flows used for projecting future cash flows in the DCF were not normalized, or adjusted for non-recurring items. Removing these abnormal items would theoretically produce more accurate cash flow projections. This limitation did not impact the majority of my comparable company analyses because next twelve months (NTM) multiples and metrics were used, which are considered normalized. Even though these limitations may have shifted valuation outputs slightly, they should not have a significant impact on findings because conclusions are drawn by analyzing variance between "high" and "low" cases of specific companies, both of which are subject to identical limitations.

This study was also limited by its small sample size and technology industry focus. Future theoretical analyses could be conducted on a larger scale across a wide variety of industries to more accurately measure potential analyst discrepancies. Next, currently available empirical research is extremely limited in quantifiable valuation discrepancy analysis as it primarily focuses on affiliated analysts' stock ratings. Some prior literature mentions EPS forecasts and stock price targets, but not the specific valuations produced by DCF and comparable company analysis that are used to justify stock rankings. As previously mentioned, the only exception to this is Paleari et al. (2014). These limitations could be due to the lack of publicly available information, or because of the extensive manual search process that would be required to collect relevant data. Regarding potential theoretical studies, the close proximity of my small-scale case study to the empirical findings of Paleari et al. (2014) suggests that a larger scale theoretical analysis has the potential to yield practical results.

IV. Conclusion

This study showcases how commonly accepted valuation methodologies can be used as weapons by affiliated sell-side analysts to artificially manipulate company valuation considerably and promote unfair competition at the expense of the investing public. My theoretical case study finds that sell-side analysts can justifiably alter "fair" company valuation by 26% using a discounted cash flow model and 19.2-21.6% using comparable company analysis. Even though conventional valuation methodologies allow for this flexibility, they continue to be important tools that yield valuable results when used honestly.

In examination of previous literature, a clear conclusion that conflict of interest occurs in affiliated analysts can be reached. This article initially hypothesized that regulations have the power to mitigate conflict of interest problems. Carapeto and Gietzmann (2011) and Kadan and Madureira (2009) have proven this to be somewhat true as regulators from Global Settlement have had some success achieving their goals around lessening conflict of interest issues. On the other hand, even after Global Settlement regulations, the separation between analysts and

investment bankers is often ignored by corporate clients and unregulated firms have not seen any progress.

Despite the existence of conflict of interest issues, sell-side analysts serve a crucial role for companies and the investor community. Their analyses provide increased transparency between companies and their public investors. This allows investors to properly assess the risks and benefits of a given entity, providing covered companies with more potential investors as well as more accurate stock prices. Overall, these benefits clearly outweigh the negative impacts of existing affiliation bias.

Imposing further regulations may reach a point of diminishing return. Since the nature of a sell-side analyst's job involves a plethora of conflicts of interest, an attempt to regulate all of them could kill the industry altogether (Newsome, 2005). Therefore, the solution may lie in a shift around industry common practices, such as putting a stronger emphasis on analyst reputation, accuracy of company valuation, and even transactions that were avoided due to their unethical nature. Moreover, moving towards reputation-based compensation packages has the potential to benefit the financial services industry in the long-run. According to the Edelman Insights (2017), although trust in financial services has showed some recovery from 2008 financial crisis lows, it is still the least-trusted industry in the world (54%). Thus, shifting the incentives of sell-side analysts may mean abandoning unethical short-term gains, but could consequently alleviate the significant amount of public distrust, providing considerable revitalization and profits to the industry in the long-run.

Appendix A: Discrepancy Analysis

The following is my discrepancy analysis discussed in the case study findings section.

Methodology	High Valuation	Low Valuation	"Fair" Valuation	% Inc/Dec Discrepancy	Current Market Cap	Total $ Discrepancy
Adobe Systems						
EBITDA Comparables	$171.02	$136.70	$153.86	11.2%	$103,103.7	$22,998.3
Revenue Comparables	133.51	107.63	120.57	10.7%	103,103.7	22,130.9
DCF	$222.08	$117.40	$169.74	30.8%	$103,103.7	$63,584.9
Lenovo						
EBITDA Comparables	$0.74	$0.42	$0.58	27.6%	$8,347.7	$4,605.6
Revenue Comparables	1.29	0.59	0.94	37.2%	8,347.7	6,216.4
DCF	$0.53	$0.36	$0.45	19.1%	$8,347.7	$3,189.0
Nintendo						
EBITDA Comparables	$488.01	$284.47	$386.24	26.3%	$55,316.8	$29,150.7
Revenue Comparables	484.60	282.67	383.64	26.3%	55,316.8	29,116.5
DCF	$439.92	$221.34	$330.63	33.1%	$55,316.8	$36,570.0
Qualcomm						
EBITDA Comparables	$93.73	$66.89	$80.31	16.7%	$97,200.7	$32,485.0
Revenue Comparables	86.99	82.56	84.78	2.6%	97,200.7	5,079.3
DCF	$83.12	$62.49	$72.81	14.2%	$97,200.7	$27,542.8
Zillow						
EBITDA Comparables	$47.41	$27.84	$37.63	26.0%	$9,039.9	$4,701.9
Revenue Comparables	36.76	38.02	NA	NA	9,039.9	NA
DCF	$71.55	$36.04	$53.80	33.0%	$9,039.9	$5,967.2

Average Discrepancies by Company

Adobe Systems	**20.9%**	**$43,074.7**
Lenovo	**25.8%**	**4,300.0**
Nintendo	**29.7%**	**32,851.8**
Qualcomm	**11.9%**	**23,162.4**
Zillow	**29.5%**	**$5,334.6**

Average Discrepancies by Methodology

EBITDA Comparables	**21.6%**	**$18,788.3**
Revenue Comparables	**19.2%**	**15,635.8**
DCF	**26.0%**	**$27,370.8**

Standard Deviation by Methodology

EBITDA Comparables	**7.3%**
Revenue Comparables	**15.5%**
DCF	**8.8%**

($ in millions, except for share prices)

Appendix B: Company Valuation Models

The following are the "high" and "low" valuation model cases for Adobe Systems, Lenovo, Nintendo, Qualcomm, and Zillow. Working capital projections will only be included in the "high" cases as the same schedule is used in both cases. Historical data is sourced from S&P Capital IQ unless otherwise specified. For each company, a football field analysis is included to showcase sensitivity analysis for each valuation methodology.

Adobe Systems Discounted Cash Flow Analysis - High Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$4,795.5**	**$5,854.4**	**$7,301.5**	*23.4%*	**$8,773.0**	**$10,301.5**	**$11,704.6**	**$12,933.6**	**$13,968.3**	*13.9%*
% growth	*NA*	*22.1%*	*24.7%*		*20.2%*	*17.4%*	*13.6%*	*10.5%*	*8.0%*	
Cost Of Goods Sold	744.3	819.9	1,010.5		1,228.2	1,442.2	1,580.1	1,746.0	1,815.9	
% revenue	*15.5%*	*14.0%*	*13.8%*		*14.0%*	*14.0%*	*13.5%*	*13.5%*	*13.0%*	
Gross Profit	**$4,051.2**	**$5,034.5**	**$6,291.0**	*24.6%*	**$7,544.8**	**$8,859.3**	**$10,124.5**	**$11,187.6**	**$12,152.4**	*12.7%*
% margin	*84.5%*	*86.0%*	*86.2%*		*86.0%*	*86.0%*	*86.5%*	*86.5%*	*87.0%*	
Selling General & Admin (1)	1,877.2	2,154.9	2,496.3		2,982.8	3,451.0	3,862.5	4,268.1	4,539.7	
% revenue	*39.1%*	*36.8%*	*34.2%*		*34.0%*	*33.5%*	*33.0%*	*33.0%*	*32.5%*	
R & D Exp.	862.7	976.0	1,224.1		1,503.9	1,765.9	2,006.4	2,217.1	2,394.4	
% of revenue	*18.0%*	*16.7%*	*16.8%*		*17.1%*	*17.1%*	*17.1%*	*17.1%*	*17.1%*	
EBITDA	**$1,311.2**	**$1,903.7**	**$2,570.7**	*40.0%*	**$3,058.1**	**$3,642.4**	**$4,255.6**	**$4,702.4**	**$5,218.3**	*14.3%*
% margin	*27.3%*	*32.5%*	*35.2%*		*34.9%*	*35.4%*	*36.4%*	*36.4%*	*37.4%*	
Depreciation & Amort.	339.5	331.5	326.0		366.4	407.2	394.7	385.5	411.5	
% of PP&E and Other Intangibles	*26.2%*	*26.9%*	*24.6%*		*30.7%*	*38.4%*	*41.3%*	*44.4%*	*52.7%*	
EBIT	**$971.7**	**$1,572.1**	**$2,244.7**	*52.0%*	**$2,691.7**	**$3,235.2**	**$3,860.9**	**$4,316.9**	**$4,806.8**	*15.6%*
% margin	*20.3%*	*26.9%*	*30.7%*		*30.7%*	*31.4%*	*33.0%*	*33.4%*	*34.4%*	
Taxes	244.2	266.4	443.7		554.9	666.9	795.9	889.9	990.9	
% tax rate implied	*25.1%*	*16.9%*	*19.8%*		*21%*	*21%*	*21%*	*21%*	*21%*	
EBIAT	**$727.5**	**$1,305.8**	**$1,801.0**	*57.3%*	**$2,136.8**	**$2,568.3**	**$3,065.0**	**$3,427.0**	**$3,815.9**	*15.6%*
Plus: D&A	339.5	331.5	326.0		366.4	407.2	394.7	385.5	411.5	
Less: Capital Expenditures	184.9	203.8	178.1		238.7	273.6	289.2	298.0	323.7	
% of revenue	*3.9%*	*3.5%*	*2.4%*		*2.7%*	*2.7%*	*2.5%*	*2.3%*	*2.3%*	
Less: Change in Net Working Capital		321.2	390.4		297.1	450.5	401.5	381.7	278.6	
Unlevered Free Cash Flow		**$1,112.3**	**$1,558.4**		**$1,967.4**	**$2,251.4**	**$2,769.0**	**$3,132.8**	**$3,625.1**	
WACC				5.9%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.97	0.92	0.87	0.82	0.77	
Present Value of Free Cash Flow					**$1,911.6**	**$2,065.1**	**$2,397.8**	**$2,561.0**	**$2,797.6**	

Enterprise Value	
Cumulative Present Value of FCF	**$11,733.0**
Terminal Value	
Terminal Year EBITDA (2022E)	$5,218.3
Exit Multiple	24.8x
Terminal Value	**$129,413.6**
Discount Factor	0.75
Present Value of Terminal Value	**$97,037.3**
% of Enterprise Value	*89.2%*
Enterprise Value	**$108,770.2**

Implied Equity Value and Share Price	
Enterprise Value	$108,770.2
Less: Total Debt	(1,900.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	2,306.1
Implied Equity Value	$109,176.3
Shares Outstanding	491.6
Implied Share Price	**$222.08**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$3,625.1
WACC	5.9%
Terminal Value	$129,413.6
Implied Perpetuity Growth Rate	**3.0%**

Implied EV/EBITDA	
Enterprise Value	$108,770.2
LTM EBITDA	2,494.1
Implied EV/EBITDA	**43.6x**

(1) Income Statement SG&A less D&A

Adobe Systems Weighted Average Cost of Capital - High Case

($ in millions, as of FQ1 2018)

WACC Calculation

Peer Capital Structure	
Debt-to-Total Capitalization	43.8%
Equity-to-Total Capitalizaion	56.2%
Peer Cost of Debt	
Cost-of-Debt	2.94%
Tax Rate	21.0%
After Tax Cost of Debt	**2.3%**
Cost of Equity	
Risk-free Rate (1)	2.91%
Expected Market Return (2)	9.20%
Market Risk Premium	6.29%
Levered Beta	0.93
Cost of Equity	**8.7%**
WACC	**5.9%**

Comparable Companies Unlevered Beta

Company	Adjusted Levered Beta (3)	Market Value of Debt	Market Value of Equity	Debt/Equity	Marginal Tax Rate	Unlevered Beta
Intuit Inc.	1.21	$1,103.0	$1,157.0	95.3%	21%	0.69
VMware, Inc.	1.36	1,500.0	8,097.0	18.5%	21%	1.18
CA, Inc.	0.98	2,926.0	5,723.0	51.1%	21%	0.70
SAP SE	0.97	5,034.0	25,540.0	19.7%	21%	0.84
Symantec	1.00	$5,587.0	$4,958.0	112.7%	21%	0.53
Mean	**1.10**			**59.5%**		**0.79**
Median	**1.00**			**51.1%**		**0.70**

Adobe Relevered Beta

	Mean Unlevered Beta	Debt/Equity	Marginal Tax Rate	Relevered Beta
Relevered Beta	0.79	22.3%	21%	**0.93**

(1) 10-year U.S. Treasury sourced from Bloomberg
(2) Most Recent Annual Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Adobe SystemsDiscounted Cash Flow Analysis - Low Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$4,795.5**	**$5,854.4**	**$7,301.5**	*23.4%*	**$8,773.0**	**$10,301.5**	**$11,704.6**	**$12,933.6**	**$13,968.3**	*13.9%*
% growth	*NA*	*22.1%*	*24.7%*		*20.2%*	*17.4%*	*13.6%*	*10.5%*	*8.0%*	
Cost Of Goods Sold	744.3	819.9	1,010.5		1,228.2	1,442.2	1,580.1	1,746.0	1,815.9	
% revenue	*15.5%*	*14.0%*	*13.8%*		*14.0%*	*14.0%*	*13.5%*	*13.5%*	*13.0%*	
Gross Profit	**$4,051.2**	**$5,034.5**	**$6,291.0**	*24.6%*	**$7,544.8**	**$8,859.3**	**$10,124.5**	**$11,187.6**	**$12,152.4**	*12.7%*
% margin	*84.5%*	*86.0%*	*86.2%*		*86.0%*	*86.0%*	*86.5%*	*86.5%*	*87.0%*	
Selling General & Admin (1)	1,877.2	2,154.9	2,496.3		2,982.8	3,451.0	3,862.5	4,268.1	4,539.7	
% revenue	*39.1%*	*36.8%*	*34.2%*		*34.0%*	*33.5%*	*33.0%*	*33.0%*	*32.5%*	
R & D Exp.	862.7	976.0	1,224.1		1,503.9	1,765.9	2,006.4	2,217.1	2,394.4	
% of revenue	*18.0%*	*16.7%*	*16.8%*		*17.1%*	*17.1%*	*17.1%*	*17.1%*	*17.1%*	
EBITDA	**$1,311.2**	**$1,903.7**	**$2,570.7**	*40.0%*	**3,058.1**	**3,642.41**	**4,255.58**	**4,702.41**	**5,218.29**	*14.3%*
% margin	*27.3%*	*32.5%*	*35.2%*		*34.9%*	*35.4%*	*36.4%*	*36.4%*	*37.4%*	
Depreciation & Amort.	339.5	331.5	326.0		366.4	407.2	394.7	385.5	411.5	
% of PP&E and Other Intangibles	*26.2%*	*26.9%*	*24.6%*		*30.7%*	*38.4%*	*41.3%*	*44.4%*	*52.7%*	
EBIT	**$971.7**	**$1,572.1**	**$2,244.7**	*52.0%*	**$2,691.7**	**$3,235.2**	**$3,860.9**	**$4,316.9**	**$4,806.8**	*15.6%*
% margin	*20.3%*	*26.9%*	*30.7%*		*30.7%*	*31.4%*	*33.0%*	*33.4%*	*34.4%*	
Taxes	244.2	266.4	443.7		554.9	666.9	795.9	889.9	990.9	
% tax rate implied	*25.1%*	*16.9%*	*19.8%*		*21%*	*21%*	*21%*	*21%*	*21%*	
EBIAT	**$727.5**	**$1,305.8**	**$1,801.0**	*57.3%*	**$2,136.8**	**$2,568.3**	**$3,065.0**	**$3,427.0**	**$3,815.9**	*15.6%*
Plus: D&A	339.5	331.5	326.0		366.4	407.2	394.7	385.5	411.5	
Less: Capital Expenditures	184.9	203.8	178.1		238.7	273.6	289.2	298.0	323.7	
% of revenue	*3.9%*	*3.5%*	*2.4%*		*2.7%*	*2.7%*	*2.5%*	*2.3%*	*2.3%*	
Less: Change in Net Working Capital		321.2	390.4		297.1	450.5	401.5	381.7	278.6	
Unlevered Free Cash Flow		**$1,112.3**	**$1,558.4**		**$1,967.4**	**$2,251.4**	**$2,769.0**	**$3,132.8**	**$3,625.1**	
WACC				8.6%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.96	0.88	0.81	0.75	0.69	
Present Value of Free Cash Flow					**$1,888.0**	**$1,989.8**	**$2,253.8**	**$2,348.3**	**$2,502.5**	

Enterprise Value	
Cumulative Present Value of FCF	**$10,982.4**
Terminal Value	
Terminal Year EBITDA (2022E)	$5,218.3
Exit Multiple	13.4x
Terminal Value	**$69,925.1**
Discount Factor	0.66
Present Value of Terminal Value	**$46,324.1**
% of Enterprise Value	*80.8%*
Enterprise Value	**$57,306.5**

Implied Equity Value and Share Price	
Enterprise Value	$57,306.5
Less: Total Debt	(1,900.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	2,306.1
Implied Equity Value	$57,712.6
Shares Outstanding	491.6
Implied Share Price	**$117.40**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$3,625.1
WACC	8.6%
Terminal Value	$69,925.1
Implied Perpetuity Growth Rate	**3.0%**

Implied EV/EBITDA	
Enterprise Value	$57,306.5
LTM EBITDA	2,494.1
Implied EV/EBITDA	**23.0x**

(1) Income Statement SG&A less D&A

Adobe Systems Weighted Average Cost of Capital - Low Case

($ in millions, as of FQ1 2018)

WACC Calculation	
Current Capital Structure	
Debt-to-Total Capitalization	18.2%
Equity-to-Total Capitalizaion	81.8%
Current Cost of Debt	
Cost-of-Debt	3.96%
Tax Rate	21.0%
After Tax Cost of Debt	**3.1%**
Cost of Equity	
Risk-free Rate (1)	2.91%
Expected Market Return (2)	9.20%
Market Risk Premium	6.29%
Adjusted Beta (3)	1.10
Cost of Equity	**9.8%**
WACC	**8.6%**

(1) 30-year U.S. Treasury sourced from Bloomberg
(2) Most Recent Quarterly Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Adobe Systems Capitalization

($ in millions, as of FQ1 2018)

Debt Outstanding

Description	Amount	Coupon	Floating Rate
3.25% Senior Notes	$1,000.0	3.25%	NA
4.75% Senior Notes	900.0	4.75%	NA
Revolving Credit Facility	-	NA	Benchmark

Capitalization Summary

	Amount	% of Total Capitalization	Weighted Average Coupon
Cash & Cash Equivalents	$2,306.1		
Revolving Credit Facility	- -	- -	Benchmark
Senior Notes	1,900.0	18.3%	4.0%
Total Debt	**$1,900.0**	**18.3%**	
Shareholders' Equity	$8,459.9	81.7%	
Total Capitalization	**10,359.9**	**100.0%**	
Net Debt	($406.1)		

Debt/Equity	**22.5%**
Debt/Total Capitalization	**18.3%**
Blended Yield of Debt Instruments	**3.96%**

Adobe Systems Peer Capitalization

($ in millions, as of most recent FQ)

Vmware

Description	Amount	% of Total Debt	Coupon
2.30% Senior Note Due August 21, 2020	$1,250.0	29.3%	2.30%
2.95% Senior Note Due August 21, 2022	1,500.0	35.1%	2.95%
3.90% Senior Note Due August 21, 2027	1,250.0	29.3%	3.90%
Notes Payable to Dell	270.0	6.3%	1.75%
Blended Yield of Debt Instruments			**3.0%**

CA

Description	Amount	% of Total Debt	Coupon
2.875% Senior Notes Due August 2018	$250.0	10.0%	2.88%
3.600% Senior Notes Due August 2020	400.0	16.0%	3.60%
3.600% Senior Notes Due August 2022	500.0	20.0%	3.60%
4.500% Senior Notes Due August 2023	250.0	10.0%	4.50%
4.700% Senior Notes Due March 2027	350.0	14.0%	4.70%
5.375% Senior Notes Due December 2019	750.0	30.0%	5.38%
Blended Yield of Debt Instruments			**4.3%**

SAP SE

Description	Amount	% of Total Debt	Coupon
Eurobond 12	$594.0	11.7%	1.00%
Eurobond 6	776.0	15.3%	2.13%
Eurobond 8	994.0	19.6%	1.13%
Eurobond 9	990.0	19.5%	1.75%
U.S. Private Placement Notes - Tranche 2	189.0	3.7%	2.95%
U.S. Private Placement Notes - Tranche 4	141.0	2.8%	3.43%
U.S. Private Placement Notes - Tranche 5	229.0	4.5%	2.13%
U.S. Private Placement Notes - Tranche 6	278.0	5.5%	2.82%
U.S. Private Placement Notes - Tranche 7	439.0	8.7%	3.18%
U.S. Private Placement Notes - Tranche 8	334.0	6.6%	3.33%
U.S. Private Placement Notes - Tranche 9	$107.0	2.1%	3.53%
Blended Yield of Debt Instruments			**2.0%**

Symantec Corporation

Description	Amount	% of Total Debt	Coupon
2.0% Convertible Senior Notes	$1,250.0	31.3%	2.00%
2.5% Convertible Senior Notes	500.0	12.5%	2.50%
3.95% Senior Notes	400.0	10.0%	3.95%
4.2% Senior Notes	750.0	18.8%	4.20%
5.0% Senior Notes	$1,100.0	27.5%	5.00%
Blended Yield of Debt Instruments			**3.5%**

Citrix Systems

Description	Amount	% of Total Debt	Coupon
0.500% Convertible Notes Due 2019	$1,386.3	65.2%	0.50%
Unsecured Senior Notes Due 2027	$741.2	34.8%	4.50%
Blended Yield of Debt Instruments			**1.9%**

Peer Cost of Debt Summary

Average	**2.9%**
Median	**3.0%**

Adobe Systems Working Capital Schedule

($ in millions)

	Historical Period			Projection Period				
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Revenue	$4,795.5	$5,854.4	$7,301.5	$8,773.0	$10,301.5	$11,704.6	$12,933.6	$13,968.3
Cost of Goods Sold	744.3	819.9	1,010.5	1,228.2	1,442.2	1,580.1	1,746.0	1,815.9
Current Assets								
Accounts Receivable	$672.0	$833.0	$1,218.0	$1,418.1	$1,608.7	$1,795.8	$1,948.9	$2,104.8
Prepaid Expenses	142.7	207.3	195.9	238.6	288.4	322.8	350.0	363.2
Other Current Assets	19.1	38.1	14.2	36.4	42.7	48.5	53.6	57.9
Total Current Assets	**$833.8**	**$1,078.5**	**$1,428.0**	**$1,693.1**	**$1,939.8**	**$2,167.1**	**$2,352.5**	**$2,525.9**
Current Liabilities								
Accounts Payable	$93.3	$88.0	$113.5	$141.3	$165.9	$181.8	$200.8	$208.9
Accrued Expenses	677.7	734.4	992.2	1,119.6	1,301.8	1,464.5	1,618.3	1,730.3
Unearned Revenue, Current	1,434.2	1,945.6	2,406.0	2,810.0	3,299.6	3,749.1	4,142.7	4,474.1
Other Current Liabilities	2.2	5.2	1.6	4.6	5.4	6.1	6.7	7.3
Total Current Liabilities	**$2,207.4**	**$2,773.3**	**$3,513.3**	**$4,075.5**	**$4,772.7**	**$5,401.4**	**$5,968.6**	**$6,420.6**
Net Working Capital	**($1,373.6)**	**($1,694.8)**	**($2,085.2)**	**($2,382.4)**	**($2,832.9)**	**($3,234.3)**	**($3,616.0)**	**($3,894.7)**
% revenue	*28.6%*	*28.9%*	*28.6%*	*27.2%*	*27.5%*	*27.6%*	*28.0%*	*27.9%*
Change in Net Working Capital		**$321.2**	**$390.4**	**$297.1**	**$450.5**	**$401.5**	**$381.7**	**$278.6**

Assumptions

Current Assets								
Days Sales Outstanding	51.1	51.9	60.9	59.0	57.0	56.0	55.0	55.0
Prepaid Expenses (% of SG&A)	7.6%	9.6%	7.8%	8.0%	8.4%	8.4%	8.2%	8.0%
Other Current Assets (% of revenue)	0.4%	0.7%	0.2%	0.4%	0.4%	0.4%	0.4%	0.4%
Current Liabilities								
Days Payable Outstanding	45.8	39.2	41.0	42.0	42.0	42.0	42.0	42.0
Accrued Expenses (% OpEx)	24.7%	23.5%	26.7%	25.0%	25.0%	25.0%	25.0%	25.0%
Unearned Revenue (% of revenue)	29.9%	33.2%	33.0%	32.0%	32.0%	32.0%	32.0%	32.0%
Other Current Liabilities (% of revenue)	0.04%	0.09%	0.02%	0.05%	0.05%	0.05%	0.05%	0.05%

Adobe Systems Comparable Company Analysis by Financial Profile - High Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
Adobe Systems Incorporated	**$103,103.7**	**$99,166.4**	**$7,301.5**	**$2,494.1**	**$3.38**	**$8,773.0**	**$3,928.0**	**$6.28**	**86.2%**	**34.2%**	**23.2%**	**24.7%**	**36.7%**	**44.9%**	**11.3x**	**25.3x**	**33.4x**
Tier I: Similar Size, Margin,and Growth Profile																	
Intuit Inc.	$43,994.8	$44,371.8	$5,434.0	$1,637.0	$3.65	$5,954.8	$2,192.5	$5.49	84.3%	30.1%	17.5%	12.0%	16.0%	(2.0%)	7.5x	20.2x	31.3x
VMware, Inc.	50,964.7	43,584.7	7,093.0	1,850.0	2.78	8,439.7	3,143.08	5.41	85.2%	26.1%	16.7%	6.7%	4.2%	19.0%	5.2x	13.9x	23.4x
CA, Inc.	14,771.6	14,726.6	4,164.0	1,220.0	1.01	4,286.13	1,648.22	2.68	85.7%	29.3%	10.2%	3.3%	(4.9%)	(46.2%)	3.4x	8.9x	13.2x
SAP SE	125,063.5	125,142.2	28,843.1	8,505.0	4.12	29,910.49	10,250.24	5.37	71.3%	29.5%	17.1%	6.3%	14.7%	10.2%	4.2x	12.2x	19.4x
Dassault Systèmes	$32,843.8	$31,050.3	$3,968.5	$1,200.6	$2.47	$4,182.6	$1,388.8	$3.61	85.3%	30.3%	16.1%	5.6%	16.5%	16.2%	7.4x	22.4x	35.6x
Mean									**82.4%**	**29.1%**	**15.5%**	**6.8%**	**9.3%**	**(0.6%)**	**5.5x**	**15.5x**	**24.6x**
Median									**85.2%**	**29.5%**	**16.7%**	**6.3%**	**14.7%**	**10.2%**	**5.2x**	**13.9x**	**23.4x**
Tier II: Different Size, Margin, and Growth Profile																	
Autodesk, Inc.	$25,337.3	$25,468.8	$1,981.6	($328.0)	($2.58)	$2,400.7	$308.8	$0.66	83.2%	(16.6%)	(28.6%)	(10.0%)	-	-	10.6x	82.5x	173.0x
Salesforce.com, inc.	83,035.6	81,995.2	9,923.0	553.4	0.01	11,981.41	2,666.66	1.60	73.2%	5.6%	0.1%	25.5%	(17.4%)	(95.9%)	6.8x	30.8x	71.9x
Nuance Communications, Inc.	4,769.7	6,558.8	1,953.3	330.9	(0.26)	2,092.33	621.37	1.19	59.2%	16.9%	(3.8%)	0.2%	(16.7%)	-	3.1x	10.6x	13.6x
Workday, Inc.	26,739.3	25,001.6	1,995.1	(205.4)	(1.67)	2,520.87	424.61	1.07	70.5%	(10.3%)	(17.2%)	36.8%	-	-	9.9x	58.9x	119.5x
Oracle Corporation	209,049.9	198,577.9	38,907.0	15,143.0	2.3	40,545.5	18,883.0	3.06	58.4%	38.9%	25.5%	4.5%	(2.1%)	12.4%	4.9x	10.5x	16.5x
Citrix Systems, Inc.	12,636.2	13,016.0	2,824.7	813.4	0.14	2,877.52	945.48	4.91	86.8%	28.8%	(0.7%)	3.2%	0.9%	-	4.5x	13.8x	18.9x
Symantec Corporation	17,048.8	20,103.8	4,739.0	859.0	1.55	4,865.91	2,295.09	1.73	78.8%	18.1%	22.2%	25.5%	13.2%	(49.4%)	4.1x	8.8x	15.8x
Open Text Corporation	$9,412.3	$11,705.6	$2,631.8	$732.4	$0.72	$2,851.5	$1,056.9	$2.74	72.6%	27.8%	7.2%	34.4%	26.4%	(83.0%)	4.1x	11.1x	12.9x
Mean									**72.8%**	**13.7%**	**0.6%**	**15.0%**	**0.7%**	**(54.0%)**	**6.0x**	**28.4x**	**55.3x**
Median									**72.9%**	**17.5%**	**(0.3%)**	**15.0%**	**(0.6%)**	**(66.2%)**	**4.7x**	**12.4x**	**17.7x**
Overall																	
Mean									**76.5%**	**19.6%**	**6.3%**	**11.8%**	**4.6%**	**(24.3%)**	**5.8x**	**23.4x**	**43.5x**
Median									**78.8%**	**27.8%**	**10.2%**	**6.3%**	**4.2%**	**(2.0%)**	**4.9x**	**13.8x**	**19.4x**
High									**86.8%**	**38.9%**	**25.5%**	**36.8%**	**26.4%**	**19.0%**	**10.6x**	**82.5x**	**173.0x**
Low									**58.4%**	**(16.6%)**	**(28.6%)**	**(10.0%)**	**(17.4%)**	**(95.9%)**	**3.1x**	**8.8x**	**12.9x**

EBITDA Valuation Output	
NTM EBITDA	$3,928.0
75th Percentile NTM EBITDA Multiple	21.3x
Implied Enterprise Value	**$83,666.8**
Less: Total Debt	(1,900.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	2,306.1
Implied Equity Value	**$84,072.9**
Shares Outstanding	491.6
Implied Share Price	**$171.02**

Revenue Valuation Output	
NTM Revenue	$8,773.0
75th Percentile NTM Revenue Multiple	7.4x
Implied Enterprise Value	**$65,227.3**
Less: Total Debt	(1,900.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	2,306.1
Implied Equity Value	**$65,633.3**
Shares Outstanding	491.6
Implied Share Price	**$133.51**

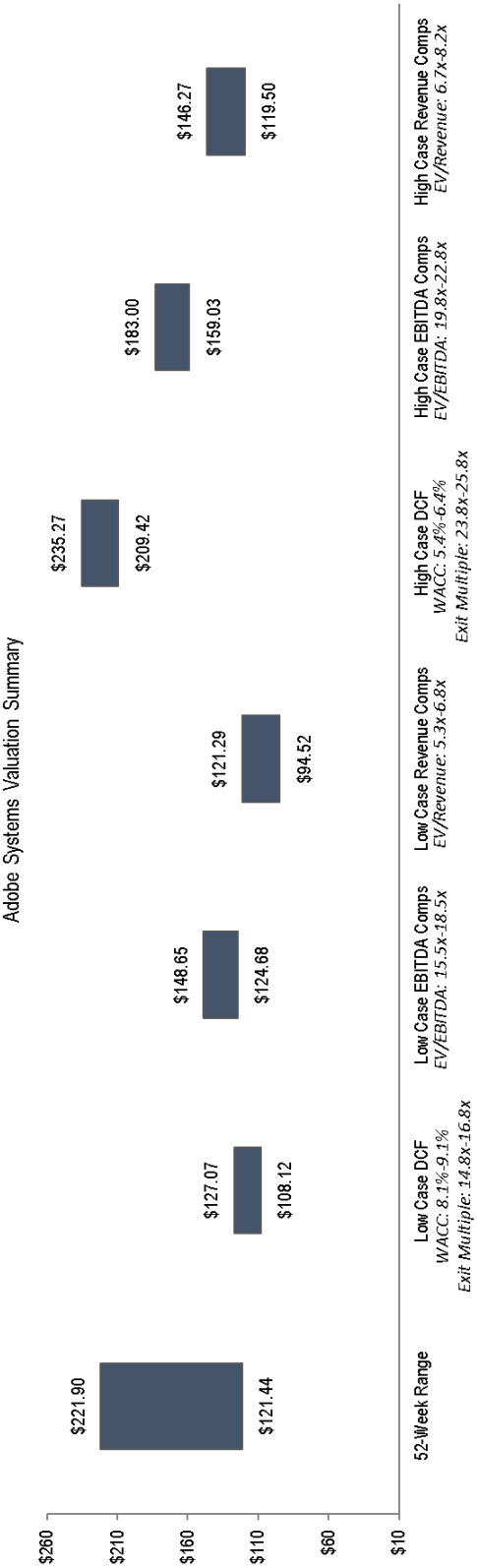
Adobe Systems Comparable Company Analysis by Business Model - Low Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
Adobe Systems Incorporated	**$103,103.7**	**$99,166.4**	**$7,301.5**	**$2,494.1**	**$3.38**	**$8,773.0**	**$3,928.0**	**$6.28**	**86.2%**	**34.2%**	**23.2%**	**24.7%**	**36.7%**	**44.9%**	**11.3x**	**25.3x**	**33.4x**
Tier I: Similar SaaS + PaaS as a % of Software Revenue																	
Intuit Inc.	$43,994.8	$44,371.8	$5,434.0	$1,637.0	$3.65	$5,954.8	$2,192.5	$5.49	84.3%	30.1%	17.5%	12.0%	16.0%	(2.0%)	7.5x	20.2x	31.3x
Citrix Systems, Inc.	12,636.2	13,016.0	2,824.7	813.4	0.14	2,877.5	945.5	4.91	86.8%	28.8%	(0.7%)	3.2%	0.9%	-	4.5x	13.8x	18.9x
Symantec Corporation	17,048.8	20,103.8	4,739.0	859.0	1.55	4,865.9	2,295.1	1.73	78.8%	18.1%	22.2%	25.5%	13.2%	(49.4%)	4.1x	8.8x	15.8x
SAP SE	125,063.5	125,142.2	28,843.1	8,505.0	4.12	29,910.5	10,250.2	5.37	71.3%	29.5%	17.1%	6.3%	14.7%	10.2%	4.2x	12.2x	19.4x
Open Text Corporation	$9,412.3	$11,705.6	$2,631.8	$732.4	$0.72	$2,851.5	$1,056.9	$2.74	72.6%	27.8%	7.2%	34.4%	26.4%	(83.0%)	4.1x	11.1x	12.9x
Mean									**78.8%**	**26.9%**	**12.7%**	**16.3%**	**14.2%**	**(31.0%)**	**4.9x**	**13.2x**	**19.7x**
Median									**78.8%**	**28.8%**	**17.1%**	**12.0%**	**14.7%**	**(25.7%)**	**4.2x**	**12.2x**	**18.9x**
Tier II: Different Product Delivery Strategy																	
Autodesk, Inc.	$25,337.3	$25,468.8	$1,981.6	($328.0)	($2.58)	$2,400.7	$308.8	$0.66	83.2%	(16.6%)	(28.6%)	(10.0%)	-	-	10.6x	82.5x	173.0x
Salesforce.com, inc.	83,035.6	81,995.2	9,923.0	553.4	0.01	11,981.4	2,666.7	1.60	73.2%	5.6%	0.1%	25.5%	(17.4%)	(95.9%)	6.8x	30.8x	71.9x
Nuance Communications, Inc.	4,769.7	6,558.8	1,953.3	330.9	(0.26)	2,092.3	621.4	1.19	59.2%	16.9%	(3.8%)	0.2%	(16.7%)	-	3.1x	10.6x	13.6x
Workday, Inc.	26,739.3	25,001.6	1,995.1	(205.4)	(1.67)	2,520.9	424.6	1.07	70.5%	(10.3%)	(17.2%)	36.8%	-	-	9.9x	58.9x	119.5x
Dassault Systèmes	32,843.8	31,050.3	3,968.5	1,200.6	2.47	4,182.6	1,388.8	3.61	85.3%	30.3%	16.1%	5.6%	16.5%	16.2%	7.4x	22.4x	35.6x
CA, Inc.	14,771.6	14,726.6	4,164.0	1,220.0	1.01	4,286.1	1,648.2	2.68	85.7%	29.3%	10.2%	3.3%	(4.9%)	(46.2%)	3.4x	8.9x	13.2x
VMware, Inc.	50,964.7	43,584.7	7,093.0	1,850.0	2.78	8,439.7	3,143.1	5.41	85.2%	26.1%	16.7%	6.7%	4.2%	19.0%	5.2x	13.9x	23.4x
Oracle Corporation	$209,049.9	$198,577.9	$38,907.0	$15,143.0	$2.33	$40,545.5	$18,883.0	$3.06	58.4%	38.9%	25.5%	4.5%	(2.1%)	12.4%	4.9x	10.5x	16.5x
Mean									**75.1%**	**15.0%**	**2.4%**	**9.1%**	**(3.4%)**	**(18.9%)**	**6.4x**	**29.8x**	**58.4x**
Median									**78.2%**	**21.5%**	**5.2%**	**5.1%**	**(3.5%)**	**12.4%**	**6.0x**	**18.1x**	**29.5x**
Overall																	
Mean									**76.5%**	**19.6%**	**6.3%**	**11.8%**	**4.6%**	**(24.3%)**	**5.8x**	**23.4x**	**43.5x**
Median									**78.8%**	**27.8%**	**10.2%**	**6.3%**	**4.2%**	**(2.0%)**	**4.9x**	**13.8x**	**19.4x**
High									**86.8%**	**38.9%**	**25.5%**	**36.8%**	**26.4%**	**19.0%**	**10.6x**	**82.5x**	**173.0x**
Low									**58.4%**	**(16.6%)**	**(28.6%)**	**(10.0%)**	**(17.4%)**	**(95.9%)**	**3.1x**	**8.8x**	**12.9x**

EBITDA Valuation Output	
NTM EBITDA	$3,928.0
75th Percentile NTM EBITDA Multiple	17.0x
Implied Enterprise Value	**$66,796.0**
Less: Total Debt	(1,900.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$2,306.1
Implied Equity Value	**$67,202.1**
Shares Outstanding	491.6
Implied Share Price	**$136.70**

Revenue Valuation Output	
NTM Revenue	$8,773.0
75th Percentile NTM Revenue Multiple	6.0x
Implied Enterprise Value	**$52,506.4**
Less: Total Debt	(1,900.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$2,306.1
Implied Equity Value	**$52,912.5**
Shares Outstanding	491.6
Implied Share Price	**$107.63**


Adobe Systems Valuation Summary
$260
$210
$160
$110
$60
$10
$221.90
$121.44
$127.07
$108.12
$148.65
$124.68
$121.29
$94.52
$235.27
$209.42
$183.00
$159.03
$146.27
$119.50
52-Week Range
Low Case DCF
WACC: 8.1%-9.1%
Exit Multiple: 14.8x-16.8x
Low Case EBITDA Comps
EV/EBITDA: 15.5x-18.5x
Low Case Revenue Comps
EV/Revenue: 5.3x-6.8x
High Case DCF
WACC: 5.4%-6.4%
Exit Multiple: 23.8x-25.8x
High Case EBITDA Comps
EV/EBITDA: 19.8x-22.8x
High Case Revenue Comps
EV/Revenue: 6.7x-8.2x

Lenovo Discounted Cash Flow Analysis - High Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$46,295.6**	**$44,912.1**	**$43,034.7**	*NA*	**$44,621.1**	**$46,078.5**	**$47,185.4**	**$48,223.5**	**$49,187.9**	*2.7%*
% growth	*NA*	*(3.0%)*	*(4.2%)*		*3.7%*	*3.3%*	*2.4%*	*2.2%*	*2.0%*	
Cost Of Goods Sold	39,613.8	38,288.2	36,929.2		38,170.5	39,417.2	40,364.1	41,252.1	42,077.2	
% revenue	*85.6%*	*85.3%*	*85.8%*		*85.5%*	*85.5%*	*85.5%*	*85.5%*	*85.5%*	
Gross Profit	**$6,681.8**	**$6,623.9**	**$6,105.5**	*NA*	**$6,450.6**	**$6,661.3**	**$6,821.3**	**$6,971.3**	**$7,110.8**	*2.5%*
% margin	*14.4%*	*14.7%*	*14.2%*		*14.5%*	*14.5%*	*14.5%*	*14.5%*	*14.5%*	
Selling General & Admin (1)	3,768.0	3,845.7	3,932.8		3,843.4	3,968.9	4,064.3	4,153.7	4,236.8	
% revenue	*8.1%*	*8.6%*	*9.1%*		*8.6%*	*8.6%*	*8.6%*	*8.6%*	*8.6%*	
R & D Exp.	1,220.9	1,491.4	1,361.7		1,356.8	1,401.1	1,434.8	1,466.3	1,495.6	
% of revenue	*2.6%*	*3.3%*	*3.2%*		*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	
EBITDA	**$1,692.9**	**$1,286.9**	**$811.0**	*NA*	**$1,250.4**	**$1,291.2**	**$1,322.2**	**$1,351.3**	**$1,378.4**	*2.5%*
% margin	*3.7%*	*2.9%*	*1.9%*		*2.8%*	*2.8%*	*2.8%*	*2.8%*	*2.8%*	
Depreciation & Amort.	417.3	635.9	599.8		769.2	804.2	812.9	789.2	762.6	
% of SG&A	*11.1%*	*16.5%*	*15.3%*		*20.0%*	*20.3%*	*20.0%*	*19.0%*	*18.0%*	
EBIT	**$1,275.6**	**$651.0**	**$211.2**	*NA*	**$481.2**	**$487.0**	**$509.4**	**$562.1**	**$615.7**	*6.4%*
% margin	*2.8%*	*1.4%*	*0.5%*		*1.1%*	*1.1%*	*1.1%*	*1.2%*	*1.3%*	
Taxes	134.4	(132.3)	(40.5)		48.1	48.7	50.9	56.2	61.6	
% tax rate implied	*10.5%*	*(20.3%)*	*(19.2%)*		*10%*	*10%*	*10%*	*10%*	*10%*	
EBIAT	**$1,141.2**	**$783.3**	**$251.7**	*NA*	**$433.0**	**$438.3**	**$458.4**	**$505.9**	**$554.2**	*6.4%*
Plus: D&A	417.3	635.9	599.8		769.2	804.2	812.9	789.2	762.6	
Less: Capital Expenditures	606.1	603.8	463.6		512.8	565.6	498.0	908.0	928.0	
% of revenue	*1.3%*	*1.3%*	*1.1%*		*1.1%*	*1.2%*	*1.1%*	*1.9%*	*1.9%*	
Less: Change in Net Working Capital		324.0	2,154.6		(74.1)	(814.7)	(371.5)	105.2	97.7	
Unlevered Free Cash Flow		**$491.4**	**($1,766.6)**		**$763.6**	**$1,491.6**	**$1,144.8**	**$281.9**	**$291.0**	
WACC				7.4%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.96	0.90	0.84	0.78	0.72	
Present Value of Free Cash Flow					**$736.8**	**$1,339.8**	**$957.2**	**$219.4**	**$210.9**	

Enterprise Value	
Cumulative Present Value of FCF	**$3,464.1**
Terminal Value	
Terminal Year EBITDA (2022E)	$1,378.4
Exit Multiple	5.2x
Terminal Value	**$7,167.47**
Discount Factor	0.70
Present Value of Terminal Value	**$5,011.1**
% of Enterprise Value	*59.1%*
Enterprise Value	**$8,475.3**

Implied Equity Value and Share Price	
Enterprise Value	$8,475.3
Less: Total Debt	(2,674.5)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(1,250.6)
Plus: Cash and Cash Equivalents	$1,765.2
Implied Equity Value	**$6,315.4**
Shares Outstanding	12014.8
Implied Share Price	**$0.53**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$291.0
WACC	7.4%
Terminal Value	$7,167.5
Implied Perpetuity Growth Rate	**3.1%**

Implied EV/EBITDA	
Enterprise Value	$8,475.3
LTM EBITDA	813.5
Implied EV/EBITDA	**10.4x**

(1) Income Statement SG&A less D&A

Lenovo Weighted Average Cost of Capital - High Case

($ in millions, as of FQ1 2018)

WACC Calculation	
Peer Capital Structure	
Debt-to-Total Capitalization	50.9%
Equity-to-Total Capitalizaion	49.1%
Peer Cost of Debt	
Cost-of-Debt	1.69%
Tax Rate	21.0%
After Tax Cost of Debt	**1.3%**
Cost of Equity	
Risk-free Rate (1)	3.85%
Expected Market Return (2)	9.43%
Market Risk Premium	12.62%
Adjusted Beta (3)	0.78
Cost of Equity	**13.7%**
WACC	**7.4%**

(1) 10-year China Government Bond Yield Sourced from Bloomberg
(2) Most Recent Annual Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Lenovo Discounted Cash Flow Analysis - Low Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$46,295.6**	**$44,912.1**	**$43,034.7**	*NA*	**$44,621.1**	**$46,078.5**	**$47,185.4**	**$48,223.5**	**$49,187.9**	*2.7%*
% growth	*NA*	*(3.0%)*	*(4.2%)*		*3.7%*	*3.3%*	*2.4%*	*2.2%*	*2.0%*	
Cost Of Goods Sold	39,613.8	38,288.2	36,929.2		38,170.5	39,417.2	40,364.1	41,252.1	42,077.2	
% revenue	*85.6%*	*85.3%*	*85.8%*		*85.5%*	*85.5%*	*85.5%*	*85.5%*	*85.5%*	
Gross Profit	**$6,681.8**	**$6,623.9**	**$6,105.5**	*NA*	**$6,450.6**	**$6,661.3**	**$6,821.3**	**$6,971.3**	**$7,110.8**	*2.5%*
% margin	*14.4%*	*14.7%*	*14.2%*		*14.5%*	*14.5%*	*14.5%*	*14.5%*	*14.5%*	
Selling General & Admin (1)	3,768.0	3,845.7	3,932.8		3,843.4	3,968.9	4,064.3	4,153.7	4,236.8	
% revenue	*8.1%*	*8.6%*	*9.1%*		*8.6%*	*8.6%*	*8.6%*	*8.6%*	*8.6%*	
R & D Exp.	1,220.9	1,491.4	1,361.7		1,356.8	1,401.1	1,434.8	1,466.3	1,495.6	
% of revenue	*2.6%*	*3.3%*	*3.2%*		*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	
EBITDA	**$1,692.9**	**$1,286.9**	**$811.0**	*NA*	**$1,250.4**	**$1,291.2**	**$1,322.2**	**$1,351.3**	**$1,378.4**	*2.5%*
% margin	*3.7%*	*2.9%*	*1.9%*		*2.8%*	*2.8%*	*2.8%*	*2.8%*	*2.8%*	
Depreciation & Amort.	417.3	635.9	599.8		769.2	804.2	812.9	789.2	762.6	
% of SG&A	*11.1%*	*16.5%*	*15.3%*		*20.0%*	*20.3%*	*20.0%*	*19.0%*	*18.0%*	
EBIT	**$1,275.6**	**$651.0**	**$211.2**	*NA*	**$481.2**	**$487.0**	**$509.4**	**$562.1**	**$615.7**	*6.4%*
% margin	*2.8%*	*1.4%*	*0.5%*		*1.1%*	*1.1%*	*1.1%*	*1.2%*	*1.3%*	
Taxes	134.4	(132.3)	(40.5)		48.1	48.7	50.9	56.2	61.6	
% tax rate implied	*10.5%*	*(20.3%)*	*(19.2%)*		*10%*	*10%*	*10%*	*10%*	*10%*	
EBIAT	**$1,141.2**	**$783.3**	**$251.7**	*NA*	**$433.0**	**$438.3**	**$458.4**	**$505.9**	**$554.2**	*6.4%*
Plus: D&A	417.3	635.9	599.8		769.2	804.2	812.9	789.2	762.6	
Less: Capital Expenditures	606.1	603.8	463.6		512.8	565.6	498.0	908.0	928.0	
% of revenue	*1.3%*	*1.3%*	*1.1%*		*1.1%*	*1.2%*	*1.1%*	*1.9%*	*1.9%*	
Less: Change in Net Working Capital		324.0	2,154.6		(74.1)	(814.7)	(371.5)	105.2	97.7	
Unlevered Free Cash Flow		**$491.4**	**($1,766.6)**		**$763.6**	**$1,491.6**	**$1,144.8**	**$281.9**	**$291.0**	
WACC				9.5%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.96	0.87	0.80	0.73	0.67	
Present Value of Free Cash Flow					**$729.9**	**$1,302.5**	**$913.3**	**$205.5**	**$193.8**	

Enterprise Value	
Cumulative Present Value of FCF	**$3,345.1**
Terminal Value	
Terminal Year EBITDA (2022E)	$1,378.4
Exit Multiple	3.6x
Terminal Value	**$4,962.1**
Discount Factor	0.64
Present Value of Terminal Value	**$3,158.4**
% of Enterprise Value	*48.6%*
Enterprise Value	**$6,503.4**

Implied Equity Value and Share Price	
Enterprise Value	$6,503.4
Less: Total Debt	(2,674.5)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(1,250.6)
Plus: Cash and Cash Equivalents	$1,765.2
Implied Equity Value	**$4,343.5**
Shares Outstanding	12,014.8
Implied Share Price	**$0.36**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$291.0
WACC	9.5%
Terminal Value	$4,962.1
Implied Perpetuity Growth Rate	**3.1%**

Implied EV/EBITDA	
Enterprise Value	$6,503.4
LTM EBITDA	813.5
Implied EV/EBITDA	**8.0x**

(1) Income Statement SG&A less D&A

Lenovo Weighted Average Cost of Capital - Low Case

($ in millions, as of FQ1 2018)

WACC Calculation

Current Capital Structure	
Debt-to-Total Capitalization	37.9%
Equity-to-Total Capitalizaion	62.1%
Current Cost of Debt	
Cost-of-Debt	4.56%
Tax Rate	21.0%
After Tax Cost of Debt	**3.6%**
Cost of Equity	
Risk-free Rate (1)	3.85%
Expected Market Return (2)	12.99%
Market Risk Premium	9.14%
Levered Beta	1.00
Cost of Equity	**13.0%**
WACC	**9.5%**

Comparable Companies Unlevered Beta

Company	Adjusted Levered Beta (3)	Market Value of Debt	Market Value of Equity	Debt/Equity	Marginal Tax Rate	Unlevered Beta
Acer	1.04	$6,212.5	$56,787.9	10.9%	21%	0.96
Fujistu	1.04	787,861.0	1,119,931.0	70.3%	21%	0.67
Inventec	1.05	51,219.1	59,468.4	86.1%	21%	0.62
Toshiba	1.06	1,122,799.0	220,893.0	508.3%	21%	0.21
Pegatron	1.23	$73,818.6	$176,493.0	41.8%	21%	0.93
Mean	**1.08**			**143.5%**		**0.68**
Median	**1.05**			**70.3%**		**0.67**

Lenovo Relevered Beta

	Mean Unlevered Beta	Debt/Equity	Marginal Tax Rate	Relevered Beta
Relevered Beta	0.68	61.1%	21%	**1.00**

(1) 10-year China Bond Yield Sourced from Bloomberg
(2) Most Recent Quarterly Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Lenovo Capitalization

($ in millions, as of FQ1 2018)

Debt Outstanding

Description	Amount	Coupon	Floating Rate
Long-Term Loans from Bank	$12.0	NA	NA
Senior Notes	1,496.8	4.70%	NA
Senior Notes	612.5	4.95%	NA
Senior Notes	496.4	3.88%	NA
Revolving Credit Facility	$56.8	2.50%	NA

Capitalization Summary

	Amount	% of Total Capitalization	Weighted Average Coupon
Cash & Cash Equivalents	$1,765.2		
Revolving Credit Facility	56.8	0.8%	2.50%
Senior Notes	2,605.7	37.0%	4.60%
Long-Term Bank Loans	12.0	0.2%	NA
Total Debt	**$2,674.5**	**37.9%**	
Shareholders' Equity	$4,376.0	62.1%	
Total Capitalization	**7,050.5**	**100.0%**	
Net Debt	$909.3		

Debt/Equity	**61.1%**
Debt/Total Capitalization	**37.9%**
Blended Yield of Debt	**4.56%**

Lenovo Peer Capitalization

($ in millions, as of most recent FQ)

Acer

Description	Amount (TWD)	% of Total Debt	Coupon
Unsecured Bank Loans	$180.0	2.9%	3.45%
Unsecured Syndicated Bank Loans	6,000.0	97.1%	1.80%
Blended Yield of Debt Instruments			**1.8%**

Fujistu

Description	Amount (JPY)	% of Total Debt	Coupon
Lease Payables	$23,114.0	5.1%	2.49%
Long-Term Loans from Banks	204,945.0	45.0%	0.40%
Short-Term Loans from Banks	47,864.0	10.5%	1.05%
The 17Th Unsecured Bonds	29,986.0	6.6%	3.00%
The 33Rd Unsecured Bonds	34,961.0	7.7%	0.41%
The 34Th Unsecured Bonds	14,968.0	3.3%	0.64%
The 35Th Unsecured Bonds	39,939.0	8.8%	0.34%
The 36Th Unsecured Bonds	29,933.0	6.6%	0.56%
The 37Th Unsecured Bonds	19,949.0	4.4%	0.35%
The 38Th Unsecured Bonds	$9,967.0	2.2%	0.53%
Blended Yield of Debt Instruments			**0.8%**

Inventec

Description	Amount (TWD)	% of Total Debt	Coupon
Secured Bank Loan TWD	$4,120.0	55.2%	1.87%
Unsecured Bank Loan TWD	3,348.0	44.8%	2.58%
Blended Yield of Debt Instruments			**2.2%**

Toshiba (1)

Description	Amount (JPY)	% of Total Debt	Coupon
Loans from Banks and Others - Unsecured	$620,462.0	52.2%	0.77%
Loans from Banks and Others Including Bank	357,551.0	30.1%	3.45%
Unsecured Yen Bonds	$209,816.0	17.7%	1.04%
Blended Yield of Debt Instruments			**1.6%**

Peer Cost of Debt Summary

Average	**1.6%**
Median	**1.6%**

(1) as of most recent FY

Lenovo Working Capital Schedule

($ in millions)

	Historical Period			Projection Period				
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Revenue	$46,295.6	$44,912.1	$43,034.7	$44,621.1	$46,078.5	$47,185.4	$48,223.5	$49,187.9
Cost of Goods Sold	39,613.8	38,288.2	36,929.2	38,170.5	39,417.2	40,364.1	41,252.1	42,077.2
Current Assets								
Total Receivables	$8,092.5	$7,485.7	$8,062.8	$7,865.7	$8,122.6	$8,317.7	$8,500.7	$8,670.7
Inventory	2,954.4	2,637.3	2,794.0	2,788.0	2,879.0	2,948.2	3,013.1	3,073.3
Prepaid Expenses	1,245.9	724.3	987.4	986.5	1,018.8	1,043.2	1,066.2	1,087.5
Other Current Assets	254.8	90.8	131.2	157.3	162.5	166.4	170.0	173.4
Total Current Assets	**$12,547.6**	**$10,938.2**	**$11,975.5**	**$11,797.5**	**$12,182.8**	**$12,475.5**	**$12,750.0**	**$13,005.0**
Current Liabilities								
Accounts Payable	$4,835.1	$4,501.3	$6,485.5	$6,274.6	$5,939.6	$5,587.0	$5,709.9	$5,824.1
Accrued Expenses	2,264.8	2,048.6	2,066.7	2,128.9	2,198.4	2,251.2	2,300.8	2,346.8
Unearned Revenue, Current	693.4	710.2	586.5	660.7	682.3	698.7	714.0	728.3
Other Current Liabilities	8,317.6	7,565.4	8,878.6	8,701.1	8,515.7	8,720.3	8,912.1	9,090.3
Total Current Liabilities	**$16,111.0**	**$14,825.5**	**$18,017.4**	**$17,765.3**	**$17,335.9**	**$17,257.1**	**$17,636.7**	**$17,989.5**
Net Working Capital	**($3,563.3)**	**($3,887.3)**	**($6,041.9)**	**($5,967.8)**	**($5,153.1)**	**($4,781.6)**	**($4,886.8)**	**($4,984.5)**
% revenue	*7.7%*	*8.7%*	*14.0%*	*13.4%*	*11.2%*	*10.1%*	*10.1%*	*10.1%*
Change in Net Working Capital		**$324.0**	**$2,154.6**	**($74.1)**	**($814.7)**	**($371.5)**	**$105.2**	**$97.7**

Assumptions

Current Assets								
Days Sales Outstanding	63.8	60.8	68.4	64.3	64.3	64.3	64.3	64.3
Days Inventory Held	27.2	25.1	27.6	26.7	26.7	26.7	26.7	26.7
Prepaid Expenses (% of SG&A)	33.1%	18.8%	25.1%	25.7%	25.7%	25.7%	25.7%	25.7%
Other Current Assets (% of revenue)	0.6%	0.2%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%
Current Liabilities								
Days Payable Outstanding	44.6	42.9	64.1	60.0	55.0	50.5	50.5	50.5
Accrued Expenses (% OpEx)	45.4%	38.4%	39.0%	40.9%	40.9%	40.9%	40.9%	40.9%
Unearned Revenue (% of revenue)	1.5%	1.6%	1.4%	1.5%	1.5%	1.5%	1.5%	1.5%
Other Current Liabilities (% of revenue)	18.0%	16.8%	20.6%	19.5%	18.5%	18.5%	18.5%	18.5%

Lenovo Comparable Company Analysis by Business Model - High Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
Lenovo Group Limited	**$6,194.1**	**$8,347.7**	**$44,290.3**	**$813.5**	**($0.01)**	**$45,133.2**	**$1,378.0**	**$0.04**	**13.8%**	**1.8%**	**(0.2%)**	**4.0%**	**(37.3%)**	**-**	**0.2x**	**5.1x**	**12.5x**
Tier I: Computer, Tablet, and Accessory Hardware Manufacturers Selling Direct to Consumer																	
ASUSTeK Computer Inc.	$6,893.8	$4,999.4	$15,232.7	$522.1	$0.75	$13,821.5	$613.1	$0.76	13.9%	3.4%	3.7%	(5.7%)	(26.9%)	(12.6%)	0.4x	8.2x	12.2x
Acer Incorporated	2,793.3	2,046.3	7,912.7	125.3	(0.05)	8,392.0	170.8	0.04	10.3%	1.6%	(1.7%)	(3.2%)	20.4%	-	0.2x	12.0x	24.9x
Toshiba Corporation	18,781.6	25,457.2	36,391.7	10,647.3	2.14	41,106.0	3,996.8	2.33	31.8%	29.3%	(10.5%)	(24.2%)	-	-	0.6x	6.4x	1.2x
Dell Technologies Inc.	$15,410.0	-	$76,799.0	$4,721.0	($5.96)	$8,156.5	$2,919.4	-	24.6%	6.1%	(4.5%)	41.6%	95.0%	-	0.3x	5.5x	14.1x
Mean									**20.2%**	**10.1%**	**(3.3%)**	**2.2%**	**29.5%**	**(12.6%)**	**0.4x**	**8.0x**	**13.1x**
Median									**19.3%**	**4.8%**	**(3.1%)**	**(4.4%)**	**20.4%**	**(12.6%)**	**0.4x**	**7.3x**	**13.2x**
Tier II: Computer Hardware Suppliers or Other Hardware Focus																	
HP Inc.	$39,458.6	$40,638.6	$53,889.0	$4,521.0	$2.27	$56,724.7	$4,659.7	$1.99	18.4%	8.4%	7.2%	10.7%	6.0%	53.2%	0.7x	8.7x	12.1x
Compal Electronics, Inc.	3,027.2	3,362.7	29,077.8	503.0	0.05	30,582.8	615.2	0.07	3.8%	1.7%	0.7%	9.0%	(14.8%)	(19.6%)	0.1x	5.5x	9.4x
Wistron Corporation	2,204.7	3,139.1	26,770.1	460.2	0.05	31,901.4	626.8	0.08	4.0%	1.7%	0.5%	25.7%	9.9%	168.8%	0.1x	5.0x	11.2x
HTC Corporation	1,694.5	969.4	2,341.5	(303.2)	(0.42)	1,984.1	(122.4)	0.95	12.4%	(13.0%)	(14.9%)	(16.0%)	-	-	0.5x	NM	2.2x
Inventec Corporation	2,803.3	3,689.5	15,285.4	443.6	0.06	16,358.2	497.8	0.08	5.5%	2.9%	1.5%	5.3%	10.0%	38.1%	0.2x	7.4x	10.3x
Pegatron Corporation	6,600.8	6,236.3	40,153.3	1,227.7	0.22	42,448.0	1,495.7	0.25	4.4%	3.1%	1.4%	(2.7%)	(27.8%)	(17.1%)	0.2x	4.2x	10.2x
Quanta Computer Inc.	7,720.6	7,238.2	34,283.4	874.6	0.13	36,294.3	1,008.6	0.17	4.7%	2.6%	1.5%	11.2%	(2.7%)	(7.4%)	0.2x	7.2x	12.1x
Logitech International S.A.	6,415.8	5,832.1	2,485.0	272.0	1.26	2,706.7	322.7	1.46	36.3%	10.9%	8.6%	16.0%	16.8%	9.4%	2.2x	18.1x	26.7x
Fujitsu Limited	$11,915.6	$16,852.2	$39,893.7	$2,698.1	$0.47	$36,776.8	$3,848.8	$0.71	27.3%	6.8%	2.6%	(6.5%)	(23.8%)	(13.9%)	0.5x	4.4x	8.2x
Mean									**13.0%**	**2.8%**	**1.0%**	**5.9%**	**(3.3%)**	**26.4%**	**0.5x**	**7.6x**	**11.4x**
Median									**5.5%**	**2.9%**	**1.5%**	**9.0%**	**1.7%**	**1.0%**	**0.2x**	**6.3x**	**10.3x**
Overall																	
Mean									**15.2%**	**5.0%**	**(0.3%)**	**4.7%**	**5.6%**	**22.1%**	**0.5x**	**7.7x**	**11.9x**
Median									**12.4%**	**3.1%**	**1.4%**	**5.3%**	**6.0%**	**(7.4%)**	**0.3x**	**6.8x**	**11.2x**
High									**36.3%**	**29.3%**	**8.6%**	**41.6%**	**95.0%**	**168.8%**	**2.2x**	**18.1x**	**26.7x**
Low									**12.4%**	**3.1%**	**1.4%**	**5.3%**	**6.0%**	**(7.4%)**	**0.3x**	**6.8x**	**11.2x**

EBITDA Valuation Output	
NTM EBITDA	$1,378.0
Average NTM EBITDA Multiple	8.0x
Implied Enterprise Value	**$11,027.2**
Less: Total Debt	(2,674.5)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(1,250.6)
Plus: Cash and Cash Equivalents	$1,765.2
Implied Equity Value	**$8,867.3**
Shares Outstanding	12,014.8
Implied Share Price	**$0.74**

Revenue Valuation Output	
NTM Revenue	$45,133.2
Average NTM Revenue Multiple	0.4x
Implied Enterprise Value	**$17,601.9**
Less: Total Debt	(2,674.5)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(1,250.6)
Plus: Cash and Cash Equivalents	$1,765.2
Implied Equity Value	**$15,442.0**
Shares Outstanding	12,014.8
Implied Share Price	**$1.29**

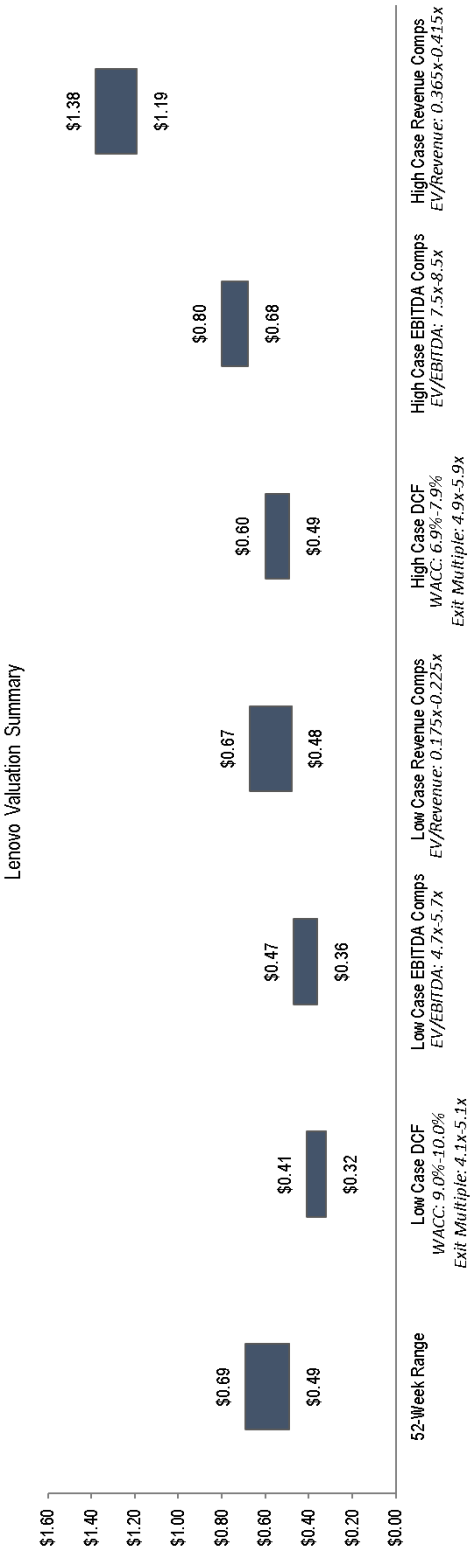
Lenovo Comparable Company Analysis by Financial Profile - Low Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
Lenovo Group Limited	**$6,194.1**	**$8,347.7**	**$44,290.3**	**$813.5**	**($0.01)**	**$45,133.2**	**$1,378.0**	**$0.040**	**13.8%**	**1.8%**	**(0.2%)**	**4.0%**	**(37.3%)**	**-**	**0.2x**	**5.1x**	**12.5x**
Tier I: Similar Size, Margin, and Growth Profile																	
Pegatron Corporation	$6,600.8	$6,236.3	$40,153.3	$1,227.7	$0.22	$42,448.0	$1,495.7	$0.25	4.4%	3.1%	1.4%	(2.7%)	(27.8%)	(17.1%)	0.2x	4.2x	10.2x
Quanta Computer Inc.	7,720.6	7,238.2	34,283.4	874.6	0.13	36,294.3	1,008.6	0.17	4.7%	2.6%	1.5%	11.2%	(2.7%)	(7.4%)	0.2x	7.2x	12.1x
Compal Electronics, Inc.	3,027.2	3,362.7	29,077.8	503.0	0.05	30,582.8	615.2	0.07	3.8%	1.7%	0.7%	9.0%	(14.8%)	(19.6%)	0.1x	5.5x	9.4x
Wistron Corporation	2,204.7	3,139.1	26,770.1	460.2	0.05	31,901.4	626.8	0.08	4.0%	1.7%	0.5%	25.7%	9.9%	168.8%	0.1x	5.0x	11.2x
Fujitsu Limited	$11,915.6	$16,852.2	$39,893.7	$2,698.1	$0.47	$36,776.8	$3,848.8	$0.71	27.3%	6.8%	2.6%	(6.5%)	(23.8%)	(13.9%)	0.5x	4.4x	8.2x
Mean									**8.8%**	**3.2%**	**1.4%**	**7.3%**	**(11.9%)**	**22.2%**	**0.2x**	**5.2x**	**10.2x**
Median									**4.4%**	**2.6%**	**1.4%**	**9.0%**	**(14.8%)**	**(13.9%)**	**0.2x**	**5.0x**	**10.2x**
Tier II: Different Size, Margin, and Growth Profile																	
ASUSTeK Computer Inc.	$6,893.8	$4,999.4	$15,232.7	$522.1	$0.75	$13,821.5	$613.1	$0.76	13.9%	3.4%	3.7%	(5.7%)	(26.9%)	(12.6%)	0.4x	8.2x	12.2x
Acer Incorporated	2,793.3	2,046.3	7,912.7	125.3	(0.05)	8,392.0	170.8	0.04	10.3%	1.6%	(1.7%)	(3.2%)	20.4%	-	0.2x	12.0x	24.9x
Toshiba Corporation	18,781.6	25,457.2	36,391.7	10,647.3	2.14	41,106.0	3,996.8	2.33	31.8%	29.3%	(10.5%)	(24.2%)	-	-	0.6x	6.4x	1.2x
Dell Technologies Inc.	15,410.0	-	76,799.0	4,721.0	(5.96)	8,156.5	2,919.4	-	24.6%	6.1%	(4.5%)	41.6%	95.0%	-	0.3x	5.5x	14.1x
HP Inc.	39,458.6	40,638.6	53,889.0	4,521.0	2.27	56,724.7	4,659.7	1.99	18.4%	8.4%	7.2%	10.7%	6.0%	53.2%	0.7x	8.7x	12.1x
Wistron Corporation	2,204.7	3,139.1	26,770.1	460.2	0.05	31,901.4	626.8	0.08	4.0%	1.7%	0.5%	25.7%	9.9%	168.8%	0.1x	5.0x	11.2x
HTC Corporation	1,694.5	969.4	2,341.5	(303.2)	(0.42)	1,984.1	(122.4)	0.95	12.4%	(13.0%)	(14.9%)	(16.0%)	-	-	0.5x	NM	2.2x
Inventec Corporation	$2,803.3	$3,689.5	$15,285.4	$443.6	$0.06	$16,358.2	$497.8	$0.08	5.5%	2.9%	1.5%	5.3%	10.0%	38.1%	0.2x	7.4x	10.3x
Mean									**15.1%**	**5.1%**	**(2.3%)**	**4.3%**	**19.1%**	**61.9%**	**0.4x**	**7.6x**	**11.0x**
Median									**13.2%**	**3.2%**	**(0.6%)**	**1.1%**	**10.0%**	**45.7%**	**0.4x**	**7.4x**	**11.6x**
Overall																	
Mean									**12.7%**	**4.3%**	**(0.9%)**	**5.5%**	**5.0%**	**39.8%**	**0.3x**	**6.6x**	**10.7x**
Median									**10.3%**	**2.9%**	**0.7%**	**5.3%**	**6.0%**	**(7.4%)**	**0.2x**	**5.9x**	**11.2x**
High									**31.8%**	**29.3%**	**7.2%**	**41.6%**	**95.0%**	**168.8%**	**0.7x**	**12.0x**	**24.9x**
Low									**3.8%**	**(13.0%)**	**(14.9%)**	**(24.2%)**	**(27.8%)**	**(19.6%)**	**0.1x**	**4.2x**	**1.2x**

EBITDA Valuation Output	
NTM EBITDA	$1,378.0
Average NTM EBITDA Multiple	5.2x
Implied Enterprise Value	**$7,223.3**
Less: Total Debt	(2,674.5)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(1,250.6)
Plus: Cash and Cash Equivalents	$1,765.2
Implied Equity Value	**$5,063.4**
Shares Outstanding	12,014.8
Implied Share Price	**$0.42**

Revenue Valuation Output	
NTM Revenue	$45,133.2
Average NTM Revenue Multiple	0.2x
Implied Enterprise Value	**$9,207.2**
Less: Total Debt	(2,674.5)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(1,250.6)
Plus: Cash and Cash Equivalents	$1,765.2
Implied Equity Value	**$7,047.3**
Shares Outstanding	12,014.8
Implied Share Price	**$0.59**


Lenovo Valuation Summary
$1.60
$1.40
$1.20
$1.00
$0.80
$0.60
$0.40
$0.20
$0.00
$0.69
$0.49
$0.41
$0.32
$0.47
$0.36
$0.67
$0.48
$0.60
$0.49
$0.80
$0.68
$1.38
$1.19
52-Week Range
Low Case DCF
WACC: 9.0%-10.0%
Exit Multiple: 4.1x-5.1x
Low Case EBITDA Comps
EV/EBITDA: 4.7x-5.7x
Low Case Revenue Comps
EV/Revenue: 0.175x-0.225x
High Case DCF
WACC: 6.9%-7.9%
Exit Multiple: 4.9x-5.9x
High Case EBITDA Comps
EV/EBITDA: 7.5x-8.5x
High Case Revenue Comps
EV/Revenue: 0.365x-0.415x

NintendoDiscounted Cash Flow Analysis - High Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$5,209.2**	**$4,779.8**	**$4,634.2**	*NA*	**$9,884.1**	**$13,197.9**	**$14,259.4**	**$14,423.3**	**$13,133.7**	*29.4%*
% growth	*NA*	*(8.2%)*	*(3.0%)*		*113.3%*	*33.5%*	*8.0%*	*1.1%*	*(8.9%)*	
Cost Of Goods Sold	3,176.0	2,686.1	2,749.6		5,815.1	7,764.7	7,557.5	7,644.4	6,895.2	
% revenue	*61.0%*	*56.2%*	*59.3%*		*58.8%*	*58.8%*	*53.0%*	*53.0%*	*52.5%*	
Gross Profit	**$2,033.2**	**$2,093.7**	**$1,884.6**	*NA*	**$4,068.9**	**$5,433.1**	**$6,701.9**	**$6,779.0**	**$6,238.5**	*11.3%*
% margin	*39.0%*	*43.8%*	*40.7%*		*41.2%*	*41.2%*	*47.0%*	*47.0%*	*47.5%*	
Selling General & Admin	1,140.3	1,069.1	996.1		1,284.9	1,385.8	1,568.5	1,442.3	1,182.0	
% revenue	*21.9%*	*22.4%*	*21.5%*		*13.0%*	*10.5%*	*11.0%*	*10.0%*	*9.0%*	
R & D Exp.	599.7	654.4	560.7		1,229.0	1,161.4	1,283.3	1,153.9	919.4	
% of revenue	*11.5%*	*13.7%*	*12.1%*		*12.4%*	*8.8%*	*9.0%*	*8.0%*	*7.0%*	
EBITDA	**$293.2**	**$370.2**	**$327.8**	*5.7%*	**$1,555.0**	**$2,885.9**	**$3,850.0**	**$4,182.8**	**$4,137.1**	*27.7%*
% margin	*5.6%*	*7.7%*	*7.1%*		*15.7%*	*21.9%*	*27.0%*	*29.0%*	*31.5%*	
Depreciation & Amort.	54.6	58.1	50.5		76.3	77.0	75.7	80.2	78.6	
% of SG&A	*4.8%*	*5.4%*	*5.1%*		*5.9%*	*5.6%*	*4.8%*	*5.6%*	*6.7%*	
EBIT	**$238.6**	**$312.0**	**$277.3**	*7.8%*	**$1,478.8**	**$2,808.9**	**$3,774.4**	**$4,102.5**	**$4,058.5**	*28.7%*
% margin	*4.6%*	*6.5%*	*6.0%*		*15.0%*	*21.3%*	*26.5%*	*28.4%*	*30.9%*	
Taxes	286.4	106.1	115.1		443.6	842.7	1,132.3	1,230.8	1,217.5	
% tax rate implied	*120.1%*	*34.0%*	*41.5%*		*30%*	*30%*	*30%*	*30%*	*30%*	
EBIAT	**($47.9)**	**$205.9**	**$162.2**	*NA*	**$1,035.1**	**$1,966.2**	**$2,642.1**	**$2,871.8**	**$2,840.9**	*28.7%*
Plus: D&A	54.6	58.1	50.5		76.3	77.0	75.7	80.2	78.6	
Less: Capital Expenditures	43.4	44.2	99.1		107.8	114.0	120.0	120.8	120.8	
% of revenue	*0.8%*	*0.9%*	*2.1%*		*1.1%*	*0.9%*	*0.8%*	*0.8%*	*0.9%*	
Less: Change in Net Working Capital		234.2	26.5		(255.0)	(161.0)	(86.3)	(11.7)	56.8	
Unlevered Free Cash Flow		**($14.3)**	**$87.1**		**$1,258.6**	**$2,090.2**	**$2,684.0**	**$2,842.9**	**$2,741.9**	
WACC				7.0%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.97	0.90	0.84	0.79	0.74	
Present Value of Free Cash Flow					**$1,216.7**	**$1,888.3**	**$2,266.0**	**$2,243.0**	**$2,021.7**	

Enterprise Value	
Cumulative Present Value of FCF	**$9,635.8**
Terminal Value	
Terminal Year EBITDA (2022E)	$4,137.1
Exit Multiple	11.4x
Terminal Value	**$47,287.1**
Discount Factor	0.71
Present Value of Terminal Value	**$33,705.4**
% of Enterprise Value	*77.8%*
Enterprise Value	**$43,341.2**

Implied Equity Value and Share Price	
Enterprise Value	$43,341.2
Less: Total Debt	- -
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(48.9)
Plus: Cash and Cash Equivalents	9,542.5
Implied Equity Value	52,834.8
Shares Outstanding	120.1
Implied Share Price	**$439.92**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$2,741.9
WACC	7.0%
Terminal Value	$47,287.1
Implied Perpetuity Growth Rate	**1.0%**

Implied EV/EBITDA	
Enterprise Value	$43,341.2
LTM EBITDA	1,585.1
Implied EV/EBITDA	**27.3x**

Nintendo Weighted Average Cost of Capital - High Case

($ in millions, as of FQ1 2018)

WACC Calculation

Peer Capital Structure	
Debt-to-Total Capitalization	13.3%
Equity-to-Total Capitalizaion	86.7%
Current Cost of Debt	
Cost-of-Debt	1.15%
Tax Rate	21.0%
After Tax Cost of Debt	**0.9%**
Cost of Equity	
Risk-free Rate (1)	0.05%
Expected Market Return (2)	9.02%
Market Risk Premium	8.97%
Levered Beta	0.88
Cost of Equity	**7.9%**
WACC	**7.0%**

Comparable Companies Unlevered Beta

Company	Adjusted Levered Beta (3)	Market Value of Debt (4)	Market Value of Equity	Debt/Equity	Marginal Tax Rate	Unlevered Beta
Activision Blizzard	0.98	$4,390.0	$9,462.0	46.4%	21%	0.72
Electronic Arts	0.71	992.0	4,086.0	24.3%	21%	0.59
Ubisoft	0.72	883.3	1,135.3	77.8%	21%	0.45
Konami	0.70	25,375.0	252,390.0	10.1%	21%	0.65
Sega Sammy	0.72	$73,505.0	$316,221.0	23.2%	21%	0.60
Mean	**0.77**			**36.4%**		**0.60**
Median	**0.72**			**24.3%**		**0.60**

Adobe Relevered Beta

	75th Percentile Unlevered Beta	Peer Debt/Equity	Marginal Tax Rate	Relevered Beta
Relevered Beta	0.68	36.4%	21%	**0.88**

(1) 10-year Japanese Government Bond Yield sourced from Bloomberg
(2) Most Recent Semi-Annual Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg
(4) Market Value of Debt & Equity in filing currencies

Nintendo Discounted Cash Flow Analysis - Low Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$5,209.2**	**$4,779.8**	**$4,634.2**	*NA*	**$9,884.1**	**$13,197.9**	**$14,259.4**	**$14,423.3**	**$13,133.7**	*29.4%*
% growth	*NA*	*(8.2%)*	*(3.0%)*		*113.3%*	*33.5%*	*8.0%*	*1.1%*	*(8.9%)*	
Cost Of Goods Sold	3,176.0	2,686.1	2,749.6		5,815.1	7,764.7	7,557.5	7,644.4	6,895.2	
% revenue	*61.0%*	*56.2%*	*59.3%*		*58.8%*	*58.8%*	*53.0%*	*53.0%*	*52.5%*	
Gross Profit	**$2,033.2**	**$2,093.7**	**$1,884.6**	*NA*	**$4,068.9**	**$5,433.1**	**$6,701.9**	**$6,779.0**	**$6,238.5**	*11.3%*
% margin	*39.0%*	*43.8%*	*40.7%*		*41.2%*	*41.2%*	*47.0%*	*47.0%*	*47.5%*	
Selling General & Admin	1,140.3	1,069.1	996.1		1,284.9	1,385.8	1,568.5	1,442.3	1,182.0	
% revenue	*21.9%*	*22.4%*	*21.5%*		*13.0%*	*10.5%*	*11.0%*	*10.0%*	*9.0%*	
R & D Exp.	599.7	654.4	560.7		1,229.0	1,161.4	1,283.3	1,153.9	919.4	
% of revenue	*11.5%*	*13.7%*	*12.1%*		*12.4%*	*8.8%*	*9.0%*	*8.0%*	*7.0%*	
EBITDA	**$293.2**	**$370.2**	**$327.8**	*5.7%*	**$1,555.0**	**$2,885.9**	**$3,850.0**	**$4,182.8**	**$4,137.1**	*27.7%*
% margin	*5.6%*	*7.7%*	*7.1%*		*15.7%*	*21.9%*	*27.0%*	*29.0%*	*31.5%*	
Depreciation & Amort.	54.6	58.1	50.5		76.3	77.0	75.7	80.2	78.6	
% of SG&A	*4.8%*	*5.4%*	*5.1%*		*5.9%*	*5.6%*	*4.8%*	*5.6%*	*6.7%*	
EBIT	**$238.6**	**$312.0**	**$277.3**	*7.8%*	**$1,478.8**	**$2,808.9**	**$3,774.4**	**$4,102.5**	**$4,058.5**	*28.7%*
% margin	*4.6%*	*6.5%*	*6.0%*		*15.0%*	*21.3%*	*26.5%*	*28.4%*	*30.9%*	
Taxes	286.4	106.1	115.1		443.6	842.7	1,132.3	1,230.8	1,217.5	
% tax rate implied	*120.1%*	*34.0%*	*41.5%*		*30%*	*30%*	*30%*	*30%*	*30%*	
EBIAT	**($47.9)**	**$205.9**	**$162.2**	*NA*	**$1,035.1**	**$1,966.2**	**$2,642.1**	**$2,871.8**	**$2,840.9**	*28.7%*
Plus: D&A	54.6	58.1	50.5		76.3	77.0	75.7	80.2	78.6	
Less: Capital Expenditures	43.4	44.2	99.1		107.8	114.0	120.0	120.8	120.8	
% of revenue	*0.8%*	*0.9%*	*2.1%*		*1.1%*	*0.9%*	*0.8%*	*0.8%*	*0.9%*	
Less: Change in Net Working Capital		234.2	26.5		(255.0)	(161.0)	(86.3)	(11.7)	56.8	
Unlevered Free Cash Flow		**($14.3)**	**$87.1**		**$1,258.6**	**$2,090.2**	**$2,684.0**	**$2,842.9**	**$2,741.9**	
WACC				16.2%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.93	0.80	0.69	0.59	0.51	
Present Value of Free Cash Flow					**$1,167.7**	**$1,669.2**	**$1,845.0**	**$1,682.1**	**$1,396.5**	

Enterprise Value	
Cumulative Present Value of FCF	**$7,760.5**
Terminal Value	
Terminal Year EBITDA (2022E)	$4,137.1
Exit Multiple	4.8x
Terminal Value	**$19,742.3**
Discount Factor	0.47
Present Value of Terminal Value	**$9,328.6**
% of Enterprise Value	*54.6%*
Enterprise Value	**$17,089.1**

Implied Equity Value and Share Price	
Enterprise Value	$17,089.1
Less: Total Debt	- -
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(48.9)
Plus: Cash and Cash Equivalents	$9,542.5
Implied Equity Value	$26,582.6
Shares Outstanding	120.1
Implied Share Price	**$221.34**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$2,741.9
WACC	16.2%
Terminal Value	$19,742.3
Implied Perpetuity Growth Rate	**1.0%**

Implied EV/EBITDA	
Enterprise Value	$17,089.1
LTM EBITDA	1,585.1
Implied EV/EBITDA	**10.8x**

Nintendo Weighted Average Cost of Capital - Low Case

($ in millions, as of FQ1 2018)

WACC Calculation	
Current Capital Structure	
Debt-to-Total Capitalization	- -
Equity-to-Total Capitalizaion	100.0%
Peer Cost of Debt	
Cost-of-Debt	2.17%
Tax Rate	21.0%
After Tax Cost of Debt	**1.7%**
Cost of Equity	
Risk-free Rate (1)	0.05%
Expected Market Return (2)	9.65%
Market Risk Premium	9.60%
Adjusted Beta (3)	1.68
Cost of Equity	**16.2%**
WACC	**16.2%**

(1) 10-year Japanese Government Bond Yield sourced from Bloomberg
(2) Most Recent Annual Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg
(4) Market Value of Debt & Equity in filing currencies

Nintendo Historical Capitalization

($ in millions)

Debt Outstanding 2010

Description	Amount	Coupon	Floating Rate
Lease Obligations	$222.0	NA	NA
Term Loans	125.0	1.20%	NA

Debt Outstanding 2011

Description	Amount	Coupon	Floating Rate
Short-Term Loans	$125.0	1.10%	NA

Current Capitalization Summary

	Amount	% of Total Capitalization	Weighted Average Coupon
Cash & Cash Equivalents	$9,542.5		
Term Loans	-	- -	NA
Total Debt	**- -**	**- -**	
Shareholders' Equity	$12,737.3	100.0%	
Total Capitalization	**12,737.3**	**100.0%**	
Net Debt	($9,542.5)		

Debt/Equity	**- -**
Debt/Total Capitalization	**- -**
Historical Blended Yield of Debt Instruments	**1.2%**

Nintendo Peer Capitalization

($ in millions, in filing currency, as of most recent FQ)

Activision Blizzard

Description	Amount	% of Total Debt	Coupon
2.3% Unsecured Senior Notes Due September	$646.0	14.7%	2.30%
2.6% Unsecured Notes	396.0	9.0%	2.60%
3.4% Unsecured Notes	394.0	9.0%	3.40%
3.4% Unsecured Senior Notes Due September	841.0	19.2%	3.40%
4.5% Unsecured Notes	390.0	8.9%	4.50%
6.125% Unsecured Senior Notes Due	741.0	16.9%	6.13%
New Tranche of Term Loans A	$982.0	22.4%	2.49%
Blended Yield of Debt Instruments			**3.5%**

Electronic Arts

Description	Amount	% of Total Debt	Coupon
3.70% Senior Notes Due 2021	$600.0	60.0%	3.70%
4.80% Senior Notes Due 2026	400.0	40.0%	4.80%
Blended Yield of Debt Instruments			**4.1%**

Ubisoft Entertainment

Description	Amount	% of Total Debt	Coupon
Bank Loans	$214.0	48.8%	1.42%
Bank Overdrafts and Short Term Credits	164.8	37.6%	0.98%
Bond Loans	40.0	9.1%	3.04%
Bond Loans	$20.0	4.6%	3.99%
Blended Yield of Debt Instruments			**1.5%**

Konami

Description	Amount	% of Total Debt	Coupon
Unsecured 0.53% per Annum Bonds Due in	$4,992.0	32.0%	0.53%
Unsecured 0.66% per Annum Bonds Due in	4,988.0	32.0%	0.66%
Unsecured Bank Loan *	$5,610.0	36.0%	1.64%
Blended Yield of Debt Instruments			**1.0%**

Sega Sammy

Description	Amount	% of Total Debt	Coupon
1St Series Unsecured Bonds	$5,000.0	4.9%	0.73%
1St Series Unsecured Bonds	8,000.0	7.8%	0.44%
2Nd Series Unsecured Bonds	1,600.0	1.6%	0.42%
3Rd Series Unsecured Bonds	10,000.0	9.7%	0.44%
3Rd Series Unsecured Bonds	10,000.0	9.7%	0.52%
4Th Series Unsecured Bonds	10,000.0	9.7%	0.57%
The 15Th Unsecured Bonds	5,000.0	4.9%	0.58%
The 16Th Unsecured Bonds	2,400.0	2.3%	0.51%
Long Term Loans	$50,854.0	49.4%	0.85%
Blended Yield of Debt Instruments			**0.7%**

Peer Cost of Debt Summary

Average	**2.2%**
Median	**1.5%**

Nintendo Working Capital

($ in millions)

	Historical Period			Projection Period				
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Revenue	$5,209.2	$4,779.8	$4,634.2	$9,884.1	$13,197.9	$14,259.4	$14,423.3	$13,133.7
Cost of Goods Sold	3,176.0	2,686.1	2,749.6	5,815.1	7,764.7	7,557.5	7,644.4	6,895.2
Current Assets								
Accounts Receivable	$524.4	$363.5	$1,001.3	$1,294.1	$1,727.9	$1,866.9	$1,888.4	$1,719.5
Inventory	728.6	383.1	370.8	982.5	1,311.9	1,276.9	1,291.6	1,165.0
Deferred Tax Assets	147.8	62.5	3.1	- -	- -	- -	- -	- -
Other Current Assets	326.6	250.2	469.4	712.7	951.6	1,028.2	1,040.0	947.0
Total Current Assets	**$1,727.3**	**$1,059.3**	**$1,844.5**	**$2,989.3**	**$3,991.4**	**$4,171.9**	**$4,219.9**	**$3,831.5**
Current Liabilities								
Accounts Payable	$554.0	$301.8	$987.1	$1,251.8	$1,671.5	$1,626.9	$1,645.6	$1,484.3
Accrued Expenses	21.0	21.7	22.2	32.6	33.1	37.0	33.7	27.3
Income Taxes Payable	156.6	17.8	106.8	93.7	93.7	93.7	93.7	93.7
Other Current Liabilities	635.0	591.3	628.4	1,256.0	1,677.1	1,812.0	1,832.8	1,668.9
Total Current Liabilities	**$1,366.6**	**$932.7**	**$1,744.5**	**$2,634.1**	**$3,475.3**	**$3,569.5**	**$3,605.8**	**$3,274.2**
Net Working Capital	**$360.74**	**$126.57**	**$100.09**	**$355.13**	**$516.12**	**$602.40**	**$614.14**	**$557.30**
% revenue	*6.9%*	*2.6%*	*2.2%*	*3.6%*	*3.9%*	*4.2%*	*4.3%*	*4.2%*
Change in Net Working Capital		**$234.2**	**$26.5**	**($255.0)**	**($161.0)**	**($86.3)**	**($11.7)**	**$56.8**

Assumptions

Current Assets								
Days Sales Outstanding	36.7	27.8	78.9	47.8	47.8	47.8	47.8	47.8
Days Inventory Held	83.7	52.1	49.2	61.7	61.7	61.7	61.7	61.7
Other Current Assets (% of revenue)	6.3%	5.2%	10.1%	7.2%	7.2%	7.2%	7.2%	7.2%
Current Liabilities								
Days Payable Outstanding	63.7	41.0	131.0	78.6	78.6	78.6	78.6	78.6
Accrued Expenses (% OpEx)	1.2%	1.3%	1.4%	1.3%	1.3%	1.3%	1.3%	1.3%
Other Current Liabilities (% of revenue)	12.2%	12.4%	13.6%	12.7%	12.7%	12.7%	12.7%	12.7%

Nintendo Comparable Company Analysis by Financial Profile - High Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
Nintendo Co., Ltd.	**$55,316.8**	**$45,823.3**	**$9,806.6**	**$1,585.1**	**$10.63**	**$10,232.5**	**$2,655.7**	**$10.48**	**37.2%**	**16.2%**	**13.0%**	**165.4%**	**544.8%**	**70.8%**	**4.5x**	**17.3x**	**44.0x**
Tier I: Similar Size, Margin, and Growth Profile																	
NEXON Co., Ltd.	$15,501.1	$11,911.6	$2,226.0	$912.7	$1.20	$2,574.3	$1,181.8	$2.03	75.9%	41.0%	24.2%	28.3%	26.9%	181.9%	4.6x	10.1x	17.4x
BANDAI NAMCO Holdings Inc.	7,119.3	5,679.3	6,103.3	740.0	1.66	6,099.1	879.2	2.13	34.5%	12.1%	6.0%	5.7%	(7.5%)	(17.1%)	0.9x	6.5x	15.2x
Electronic Arts Inc.	38,368.6	34,476.6	5,095.0	1,541.0	3.21	5,450.8	2,000.6	4.77	75.8%	30.2%	19.7%	10.1%	26.0%	(22.9%)	6.3x	17.2x	26.2x
Take-Two Interactive Software,	12,663.8	11,355.8	1,914.2	240.0	1.63	2,527.5	722.5	4.18	46.6%	12.5%	9.5%	20.7%	151.5%	1,161.7%	4.5x	15.7x	26.5x
Activision Blizzard, Inc.	$56,146.3	$55,768.3	$7,017.0	$2,227.0	$0.36	$7,516.0	$2,821.7	$2.62	64.4%	31.7%	3.9%	6.2%	(2.7%)	(71.7%)	7.4x	19.8x	28.2x
Mean									**59.4%**	**25.5%**	**12.6%**	**14.2%**	**38.8%**	**246.4%**	**4.8x**	**13.9x**	**22.7x**
Median									**64.4%**	**30.2%**	**9.5%**	**10.1%**	**26.0%**	**(17.1%)**	**4.6x**	**15.7x**	**26.2x**
Tier II: Different Size, Margin, and Growth Profile																	
Ubisoft Entertainment SA	$8,792.5	$9,021.9	$2,025.3	$260.5	$1.62	$2,449.9	$1,013.0	$3.09	82.2%	12.9%	9.3%	12.0%	(70.0%)	49.4%	3.7x	8.9x	26.0x
Koei Tecmo Holdings Co., Ltd.	2,112.3	2,083.3	349.3	111.8	1.24	438.5	143.1	1.24	51.6%	32.0%	37.7%	(7.8%)	0.1%	38.8%	4.8x	14.6x	16.2x
GungHo Online Entertainment, Inc.	2,493.3	1,971.0	874.6	336.9	0.3	773.3	271.8	0.21	61.3%	38.5%	24.3%	(17.9%)	(26.7%)	(19.8%)	2.6x	7.3x	16.5x
Capcom Co., Ltd.	2,225.3	2,135.2	771.3	195.7	1.83	882.3	215.8	1.91	41.3%	25.4%	13.0%	10.8%	63.7%	201.5%	2.4x	9.9x	21.2x
Konami Holdings Corporation	6,944.9	5,831.6	2,318.1	551.7	2.16	2,473.3	671.7	2.57	40.4%	23.8%	12.8%	4.3%	2.4%	25.8%	2.4x	8.7x	20.0x
Square Enix Holdings Co., Ltd.	5,116.4	3,965.1	2,414.5	472.1	1.98	2,434.6	479.0	2.25	49.7%	19.6%	9.9%	1.4%	67.3%	8.2%	1.6x	8.3x	19.1x
Sega Sammy Holdings Inc.	$3,455.5	$2,415.1	$3,240.6	$399.3	$0.20	$3,117.5	$444.9	$0.55	36.5%	12.3%	1.4%	(12.0%)	(33.3%)	(86.3%)	0.8x	5.4x	26.7x
Mean									**51.9%**	**23.5%**	**15.5%**	**(1.3%)**	**0.5%**	**31.1%**	**2.6x**	**9.0x**	**20.8x**
Median									**49.7%**	**23.8%**	**12.8%**	**1.4%**	**0.1%**	**25.8%**	**2.4x**	**8.7x**	**20.0x**
Overall																	
Mean									**55.0%**	**24.3%**	**14.3%**	**5.2%**	**16.5%**	**120.8%**	**3.5x**	**11.0x**	**21.6x**
Median									**50.7%**	**24.6%**	**11.4%**	**5.9%**	**1.2%**	**17.0%**	**3.1x**	**9.4x**	**20.6x**
High									**82.2%**	**41.0%**	**37.7%**	**28.3%**	**151.5%**	**1,161.7%**	**7.4x**	**19.8x**	**28.2x**
Low									**34.5%**	**12.1%**	**1.4%**	**(17.9%)**	**(70.0%)**	**(86.3%)**	**0.8x**	**5.4x**	**15.2x**

EBITDA Valuation Output	
NTM EBITDA	$2,655.7
75th Percentile NTM EBITDA Multiple	18.5x
Implied Enterprise Value	**$49,116.6**
Less: Total Debt	- -
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(48.9)
Plus: Cash and Cash Equivalents	$9,542.5
Implied Equity Value	**$58,610.1**
Shares Outstanding	120.1
Implied Share Price	**$488.01**

Revenue Valuation Output	
NTM Revenue	$10,232.5
Average NTM Revenue Multiple	4.8x
Implied Enterprise Value	**$48,706.5**
Less: Total Debt	- -
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(48.9)
Plus: Cash and Cash Equivalents	$9,542.5
Implied Equity Value	**$58,200.0**
Shares Outstanding	120.1
Implied Share Price	**$484.60**

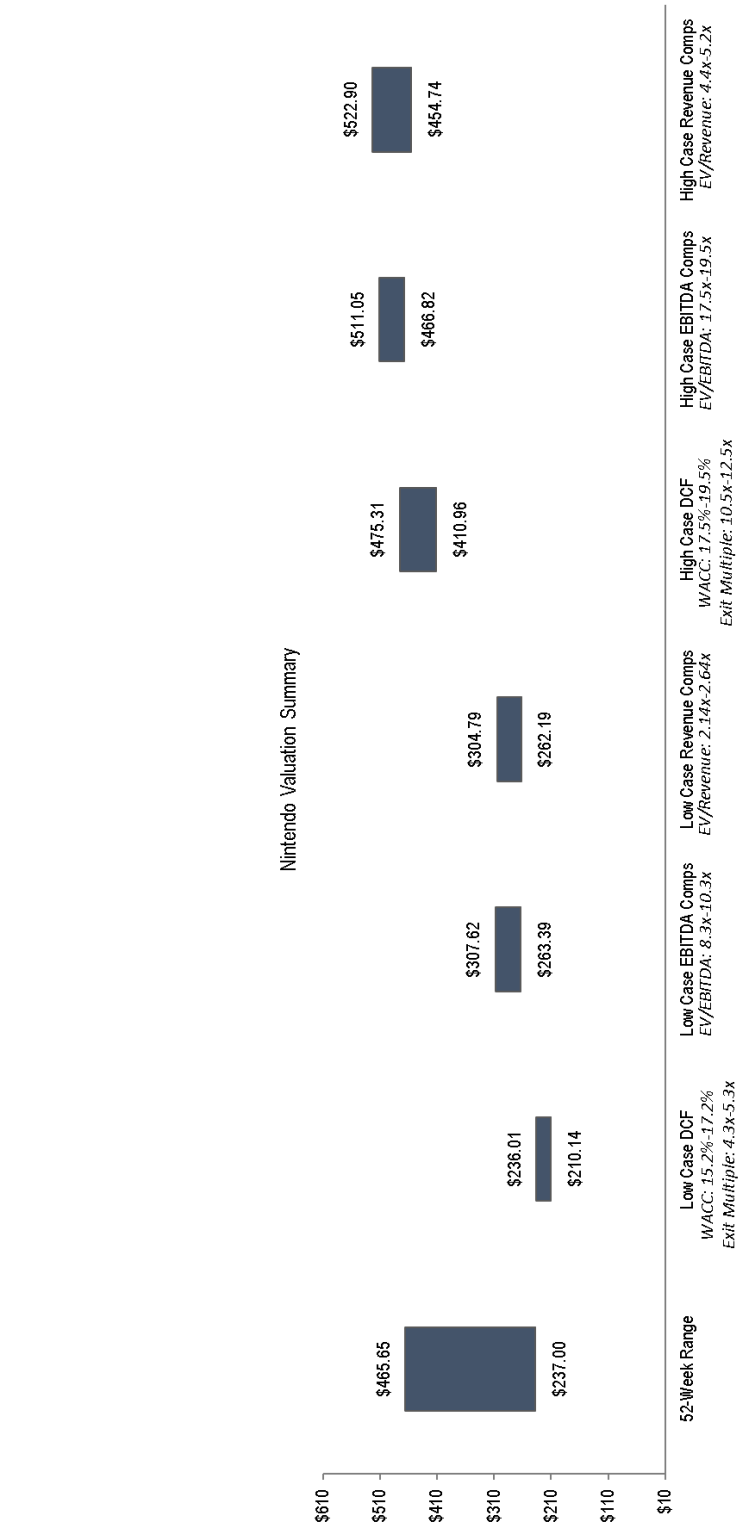
Nintendo Comparable Company Analysis by Business Model - Low Case

($ in millions)

Company	Equity Value	Enterprise Value	LTM Financial Statistics: Revenue	LTM Financial Statistics: EBITDA	LTM Financial Statistics: EPS	NTM Financial Statistics: Revenue	NTM Financial Statistics: EBITDA	NTM Financial Statistics: EPS	LTM Profitability Margins: Gross Profit	LTM Profitability Margins: EBITDA	LTM Profitability Margins: Net Income	LTM Growth Rates: Revenue	LTM Growth Rates: EBITDA	LTM Growth Rates: Net Income	NTM Multiples: EV / Revenue	NTM Multiples: EV / EBITDA	NTM Multiples: P / EPS
Nintendo Co., Ltd.	**$55,316.8**	**$45,823.3**	**$9,806.6**	**$1,585.1**	**$10.63**	**$10,232.5**	**$2,655.7**	**$10.48**	**37.2%**	**16.2%**	**13.0%**	**165.4%**	**544.8%**	**70.8%**	**4.5x**	**17.3x**	**44.0x**
Tier I: Video Game Hardware & Software Developers																	
Capcom Co., Ltd.	$2,225.3	$2,135.2	$771.3	$195.7	$1.83	$882.3	$215.8	$1.91	41.3%	25.4%	13.0%	10.8%	63.7%	201.5%	2.4x	9.9x	21.2x
Konami Holdings Corporation	6,944.9	5,831.6	2,318.1	551.7	2.16	2,473.3	671.7	2.57	40.4%	23.8%	12.8%	4.3%	2.4%	25.8%	2.4x	8.7x	20.0x
Square Enix Holdings Co., Ltd.	5,116.4	3,965.1	2,414.5	472.1	1.98	2,434.6	479.0	2.25	49.7%	19.6%	9.9%	1.4%	67.3%	8.2%	1.6x	8.3x	19.1x
BANDAI NAMCO Holdings Inc.	7,119.3	5,679.3	6,103.3	740.0	1.66	6,099.1	879.2	2.13	34.5%	12.1%	6.0%	5.7%	(7.5%)	(17.1%)	0.9x	6.5x	15.2x
Sega Sammy Holdings Inc.	$3,455.5	$2,415.1	$3,240.6	$399.3	$0.20	$3,117.5	$444.9	$0.55	36.5%	12.3%	1.4%	(12.0%)	(33.3%)	(86.3%)	0.8x	5.4x	26.7x
Mean									**40.5%**	**18.6%**	**8.6%**	**2.0%**	**18.5%**	**26.4%**	**1.6x**	**7.8x**	**20.4x**
Median									**40.4%**	**19.6%**	**9.9%**	**4.3%**	**2.4%**	**8.2%**	**1.6x**	**8.3x**	**20.0x**
Tier II: Video Game Software Developers																	
Ubisoft Entertainment SA	$8,792.5	$9,021.9	$2,025.3	$260.5	$1.62	$2,449.9	$1,013.0	$3.09	82.2%	12.9%	9.3%	12.0%	(70.0%)	49.4%	3.7x	8.9x	26.0x
Koei Tecmo Holdings Co., Ltd.	2,112.3	2,083.3	349.3	111.8	1.24	438.5	143.1	1.24	51.6%	32.0%	37.7%	(7.8%)	0.1%	38.8%	4.8x	14.6x	16.2x
Electronic Arts Inc.	38,368.6	34,476.6	5,095.0	1,541.0	3.21	5,450.8	2,000.6	4.77	75.8%	30.2%	19.7%	10.1%	26.0%	(22.9%)	6.3x	17.2x	26.2x
Take-Two Interactive Software,	12,663.8	11,355.8	1,914.2	240.0	1.63	2,527.5	722.5	4.18	46.6%	12.5%	9.5%	20.7%	151.5%	1,161.7%	4.5x	15.7x	26.5x
Activision Blizzard, Inc.	56,146.3	55,768.3	7,017.0	2,227.0	0.36	7,516.0	2,821.7	2.62	64.4%	31.7%	3.9%	6.2%	(2.7%)	(71.7%)	7.4x	19.8x	28.2x
GungHo Online Entertainment, Inc.	2,493.3	1,971.0	874.6	336.9	0.3	773.3	271.8	0.21	61.3%	38.5%	24.3%	(17.9%)	(26.7%)	(19.8%)	2.6x	7.3x	16.5x
NEXON Co., Ltd.	$15,501.1	$11,911.6	$2,226.0	$912.7	$1.20	$2,574.3	$1,181.8	$2.03	75.9%	41.0%	24.2%	28.3%	26.9%	181.9%	4.6x	10.1x	17.4x
Mean									**65.4%**	**28.4%**	**18.4%**	**7.4%**	**15.0%**	**188.2%**	**4.8x**	**13.4x**	**22.4x**
Median									**64.4%**	**31.7%**	**19.7%**	**10.1%**	**0.1%**	**38.8%**	**4.6x**	**14.6x**	**26.0x**
Overall																	
Mean									**55.0%**	**24.3%**	**14.3%**	**5.2%**	**16.5%**	**120.8%**	**3.5x**	**11.0x**	**21.6x**
Median									**50.7%**	**24.6%**	**11.4%**	**5.9%**	**1.2%**	**17.0%**	**3.1x**	**9.4x**	**20.6x**
High									**82.2%**	**41.0%**	**37.7%**	**28.3%**	**151.5%**	**1,161.7%**	**7.4x**	**19.8x**	**28.2x**
Low									**50.7%**	**24.6%**	**11.4%**	**5.9%**	**1.2%**	**17.0%**	**3.1x**	**9.4x**	**20.6x**

EBITDA Valuation Output	
NTM EBITDA	$2,655.7
75th Percentile NTM EBITDA Multiple	9.3x
Implied Enterprise Value	**$24,671.2**
Less: Total Debt	- -
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(48.9)
Plus: Cash and Cash Equivalents	$9,542.5
Implied Equity Value	**$34,164.7**
Shares Outstanding	120.1
Implied Share Price	**$284.47**

Revenue Valuation Output	
NTM Revenue	$10,232.5
75th Percentile NTM Revenue Multiple	2.4x
Implied Enterprise Value	**$24,455.6**
Less: Total Debt	- -
Less: Preferred Stock	- -
Less: Noncontrolling Interest	(48.9)
Plus: Cash and Cash Equivalents	$9,542.5
Implied Equity Value	**$33,949.1**
Shares Outstanding	120.1
Implied Share Price	**$282.67**


Nintendo Valuation Summary
$610
$510
$410
$310
$210
$110
$10
52-Week Range
$465.65
$237.00
Low Case DCF
WACC: 15.2%-17.2%
Exit Multiple: 4.3x-5.3x
$236.01
$210.14
Low Case EBITDA Comps
EV/EBITDA: 8.3x-10.3x
$307.62
$263.39
Low Case Revenue Comps
EV/Revenue: 2.14x-2.64x
$304.79
$262.19
High Case DCF
WACC: 17.5%-19.5%
Exit Multiple: 10.5x-12.5x
$475.31
$410.96
High Case EBITDA Comps
EV/EBITDA: 17.5x-19.5x
$511.05
$466.82
High Case Revenue Comps
EV/Revenue: 4.4x-5.2x
$522.90
$454.74

Qualcomm Discounted Cash Flow Analysis - High Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$25,281.0**	**$23,554.0**	**$22,291.0**	*NA*	**$22,176.4**	**$22,810.6**	**$23,557.2**	**$24,263.9**	**$24,991.8**	*2.3%*
% growth	*NA*	*(6.8%)*	*(5.4%)*		*(0.5%)*	*2.9%*	*3.3%*	*3%*	*3%*	
Cost Of Goods Sold	10,106.0	9,315.0	9,355.0		9,092.3	9,237.5	9,539.8	9,826.0	10,120.8	
% revenue	*40.0%*	*39.5%*	*42.0%*		*41.0%*	*40.5%*	*40.5%*	*40.5%*	*40.5%*	
Gross Profit	**$15,175.0**	**$14,239.0**	**$12,936.0**	*NA*	**$13,084.1**	**$13,573.1**	**$14,017.3**	**$14,437.8**	**$14,871.0**	*3.3%*
% margin	*60.0%*	*60.5%*	*58.0%*		*59.0%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	
Selling General & Admin (1)	$1,649.0	$1,662.0	$1,702.0		$1,403.6	$1,350.0	$1,349.7	$1,343.3	$1,336.7	
% revenue	*6.5%*	*7.1%*	*7.6%*		*6%*	*6%*	*6%*	*6%*	*5%*	
R & D Exp.	5,476.0	5,141.0	5,465.0		5,211.5	5,170.7	5,339.9	5,500.1	5,665.1	
% of revenue	*21.7%*	*21.8%*	*24.5%*		*23.50%*	*22.67%*	*22.67%*	*22.67%*	*22.67%*	
EBITDA	**$8,050.0**	**$7,436.0**	**$5,769.0**	*NA*	**$6,469.0**	**$7,052.4**	**$7,327.7**	**$7,594.4**	**$7,869.1**	*5.0%*
% margin	*31.8%*	*31.6%*	*25.9%*		*29.2%*	*30.9%*	*31.1%*	*31.3%*	*31.5%*	
Depreciation & Amort.	623.0	624.0	684.0		814.0	885.1	958.6	1,034.2	1,112.2	
% of PP&E	*10.6%*	*10.3%*	*9.2%*		*10.0%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*	
EBIT	**$7,427.0**	**$6,812.0**	**$5,085.0**	*NA*	**$5,655.0**	**$6,167.3**	**$6,369.1**	**$6,560.2**	**$6,757.0**	*4.6%*
% margin	*29.4%*	*28.9%*	*22.8%*		*25.5%*	*27.0%*	*27.0%*	*27.0%*	*27.0%*	
Taxes	1,219.0	1,131.0	555.0		792.7	864.5	892.8	919.6	947.2	
% tax rate implied	*15.5%*	*15.9%*	*10.7%*		*14%*	*14%*	*14%*	*14%*	*14%*	
EBIAT	**$6,208.0**	**$5,681.0**	**$4,530.0**	*NA*	**$4,862.29**	**$5,302.8**	**$5,476.3**	**$5,640.6**	**$5,809.8**	*4.6%*
Plus: D&A	623.0	624.0	684.0		814.0	885.1	958.6	1,034.2	1,112.2	
Less: Capital Expenditures	994.0	539.0	690.0		688.6	708.3	731.5	753.4	776.0	
% of revenue	*3.9%*	*2.3%*	*3.1%*		*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	
Less: Change in Net Working Capital		339.0	916.0		(347.6)	(185.7)	(29.6)	(195.3)	150.8	
Unlevered Free Cash Flow		**$5,427.0**	**$3,608.0**		**$5,335.3**	**$5,665.3**	**$5,733.0**	**$6,116.7**	**$5,995.2**	
WACC				7.1%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.97	0.90	0.84	0.79	0.73	
Present Value of Free Cash Flow					**$5,154.6**	**$5,108.8**	**$4,825.5**	**$4,805.6**	**$4,396.4**	

Enterprise Value	
Cumulative Present Value of FCF	**$24,291.0**
Terminal Value	
Terminal Year EBITDA (2022E)	$7,869.1
Exit Multiple	15.8x
Terminal Value	**$124,332.4**
Discount Factor	0.71
Present Value of Terminal Value	**$88,087.5**
% of Enterprise Value	*78.4%*
Enterprise Value	**$112,378.5**

Implied Equity Value and Share Price	
Enterprise Value	$112,378.45
Less: Total Debt	(23,000.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$33,362.0
Implied Equity Value	**$122,740.5**
Shares Outstanding	1,476.8
Implied Share Price	**$83.12**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$5,995.2
WACC	7.1%
Terminal Value	$124,332.4
Implied Perpetuity Growth Rate	**2.0%**

Implied EV/EBITDA	
Enterprise Value	$112,378.5
LTM EBITDA	6,951.0
Implied EV/EBITDA	**16.2x**

(1) Income Statement SG&A less D&A

Qualcomm Weighted Average Cost of Capital - High Case

($ in millions, as of FQ1 2018)

WACC Calculation	
Current Capital Structure	
Debt-to-Total Capitalization	49.0%
Equity-to-Total Capitalizaion	51.0%
Current Cost of Debt	
Cost-of-Debt	2.79%
Tax Rate	21.0%
After Tax Cost of Debt	**2.2%**
Cost of Equity	
Risk-free Rate (1)	3.17%
Expected Market Return (2)	9.22%
Market Risk Premium	6.06%
Adjusted Beta (3)	1.44
Cost of Equity	**11.9%**
WACC	**7.1%**

(1) 30-year U.S. Treasury sourced from Bloomberg
(2) Most Recent Quarterly Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Qualcomm Discounted Cash Flow Analysis - Low Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$25,281.0**	**$23,554.0**	**$22,291.0**	*NA*	**$22,176.4**	**$22,810.6**	**$23,557.2**	**$24,263.9**	**$24,991.8**	*2.3%*
% growth	*NA*	*(6.8%)*	*(5.4%)*		*(0.5%)*	*2.9%*	*3.3%*	*3%*	*3%*	
Cost Of Goods Sold	10,106.0	9,315.0	9,355.0		9,092.3	9,237.5	9,539.8	9,826.0	10,120.8	
% revenue	*40.0%*	*39.5%*	*42.0%*		*41.0%*	*40.5%*	*40.5%*	*40.5%*	*40.5%*	
Gross Profit	**$15,175.0**	**$14,239.0**	**$12,936.0**	*NA*	**$13,084.1**	**$13,573.1**	**$14,017.3**	**$14,437.8**	**$14,871.0**	*3.3%*
% margin	*60.0%*	*60.5%*	*58.0%*		*59.0%*	*59.5%*	*59.5%*	*59.5%*	*59.5%*	
Selling General & Admin (1)	$1,649.0	$1,662.0	$1,702.0		$1,403.6	$1,350.0	$1,349.7	$1,343.3	$1,336.7	
% revenue	*6.5%*	*7.1%*	*7.6%*		*6%*	*6%*	*6%*	*6%*	*5%*	
R & D Exp.	5,476.0	5,141.0	5,465.0		5,211.5	5,170.7	5,339.9	5,500.1	5,665.1	
% of revenue	*21.7%*	*21.8%*	*24.5%*		*23.50%*	*22.67%*	*22.67%*	*22.67%*	*22.67%*	
EBITDA	**$8,050.0**	**$7,436.0**	**$5,769.0**	*NA*	**$6,469.0**	**$7,052.4**	**$7,327.7**	**$7,594.4**	**$7,869.1**	*5.0%*
% margin	*31.8%*	*31.6%*	*25.9%*		*29.2%*	*30.9%*	*31.1%*	*31.3%*	*31.5%*	
Depreciation & Amort.	623.0	624.0	684.0		814.0	885.1	958.6	1,034.2	1,112.2	
% of PP&E	*10.6%*	*10.3%*	*9.2%*		*10.0%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*	
EBIT	**$7,427.0**	**$6,812.0**	**$5,085.0**	*NA*	**$5,655.0**	**$6,167.3**	**$6,369.1**	**$6,560.2**	**$6,757.0**	*4.6%*
% margin	*29.4%*	*28.9%*	*22.8%*		*25.5%*	*27.0%*	*27.0%*	*27.0%*	*27.0%*	
Taxes	1,219.0	1,131.0	555.0		792.7	864.5	892.8	919.6	947.2	
% tax rate implied	*15.5%*	*15.9%*	*10.7%*		*14%*	*14%*	*14%*	*14%*	*14%*	
EBIAT	**$6,208.0**	**$5,681.0**	**$4,530.0**	*NA*	**$4,862.29**	**$5,302.8**	**$5,476.3**	**$5,640.6**	**$5,809.8**	*4.6%*
Plus: D&A	623.0	624.0	684.0		814.0	885.1	958.6	1,034.2	1,112.2	
Less: Capital Expenditures	994.0	539.0	690.0		688.6	708.3	731.5	753.4	776.0	
% of revenue	*3.9%*	*2.3%*	*3.1%*		*3.1%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	
Less: Change in Net Working Capital		339.0	916.0		(347.6)	(185.7)	(29.6)	(195.3)	150.8	
Unlevered Free Cash Flow		**$5,427.0**	**$3,608.0**		**$5,335.3**	**$5,665.3**	**$5,733.0**	**$6,116.7**	**$5,995.2**	
WACC				9.1%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.96	0.88	0.81	0.74	0.68	
Present Value of Free Cash Flow					**$5,108.9**	**$4,974.1**	**$4,615.3**	**$4,515.1**	**$4,057.7**	

Enterprise Value	
Cumulative Present Value of FCF	**$23,271.1**
Terminal Value	
Terminal Year EBITDA (2022E)	$7,869.1
Exit Multiple	11.5x
Terminal Value	**$90,495.1**
Discount Factor	0.65
Present Value of Terminal Value	**$58,649.8**
% of Enterprise Value	*71.6%*
Enterprise Value	**$81,920.9**

Implied Equity Value and Share Price	
Enterprise Value	$81,920.86
Less: Total Debt	(23,000)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$33,362.0
Implied Equity Value	**$92,282.9**
Shares Outstanding	1,476.8
Implied Share Price	**$62.49**

Implied Perpetuity Growth Rate	
Terminal Year Free Cash Flow (2022	$5,995.2
WACC	9.1%
Terminal Value	$90,495.1
Implied Perpetuity Growth Rate	**2.0%**

Implied EV/EBITDA	
Enterprise Value	$81,920.9
LTM EBITDA	6,951.0
Implied EV/EBITDA	**11.8x**

(1) Income Statement SG&A less D&A

Qualcomm Weighted Average Cost of Capital - Low Case

($ in millions, as of FQ1 2018)

WACC Calculation

Peer Capital Structure	
Debt-to-Total Capitalization	34.4%
Equity-to-Total Capitalizaion	65.6%
Peer Cost of Debt	
Cost-of-Debt	3.06%
Tax Rate	21.0%
After Tax Cost of Debt	**2.4%**
Cost of Equity	
Risk-free Rate (1)	2.91%
Expected Market Return (2)	9.43%
Market Risk Premium	6.52%
Levered Beta	1.48
Cost of Equity	**12.5%**
WACC	**9.1%**

Comparable Companies Unlevered Beta

Company	Adjusted Levered Beta (3)	Market Value of Debt	Market Value of Equity	Debt/Equity	Marginal Tax Rate	Unlevered Beta
Advanced Microdevic	1.70	$1,395.0	$611.0	228.3%	21%	0.61
Broadcom	1.17	17,548.0	23,186.0	75.7%	21%	0.73
NVIDIA	1.36	2,000.0	7,471.0	26.8%	21%	1.12
Micron Technology	1.15	9,063.0	23,393.0	38.7%	21%	0.88
Xilinx	1.39	$1,742.0	$2,364.6	73.7%	21%	0.88
Mean	**1.35**			**88.6%**		**0.84**
Median	**1.36**			**73.7%**		**0.88**

Qualcomm Relevered Beta

	Mean Unlevered Beta	Debt/Equity	Marginal Tax Rate	Relevered Beta
Relevered Beta	0.84	95.5%	21%	**1.48**

(1) 10-year U.S. Treasury sourced from Bloomberg

(2) Most Recent Annual Expected Market Return sourced from Bloomberg

(3) Sourced from Bloomberg

Qualcomm Capitalization

($ in millions, as of FQ1 2018)

Debt Outstanding

Description	Amount	Coupon	Floating Rate
Fixed-Rate 1.40% Notes Due May 18, 2018	$1,250.0	1.40%	NA
Fixed-Rate 1.85% Notes Due May 20, 2019	1,250.0	1.85%	NA
Fixed-Rate 2.10% Notes Due May 20, 2020	1,500.0	2.10%	NA
Fixed-Rate 2.25% Notes Due May 20, 2020	1,750.0	2.25%	NA
Fixed-Rate 2.60% Notes Due January 30, 2023	1,500.0	2.60%	NA
Fixed-Rate 2.90% Notes Due May 20, 2024	1,500.0	2.90%	NA
Fixed-Rate 3.00% Notes Due May 20, 2022	2,000.0	3.00%	NA
Fixed-Rate 3.25% Notes Due May 20, 2027	2,000.0	3.25%	NA
Fixed-Rate 3.45% Notes Due May 20, 2025	2,000.0	3.45%	NA
Fixed-Rate 4.30% Notes Due May 20, 2047	1,500.0	4.30%	NA
Fixed-Rate 4.65% Notes Due May 20, 2035	1,000.0	4.65%	NA
Fixed-Rate 4.80% Notes Due May 20, 2045	1,500.0	4.80%	NA
Floating-Rate Three-Month LIBOR plus 0.27% Notes Due May 18, 2018	250.0	1.77%	3-Month LIBOR + 0.270%
Floating-Rate Three-Month LIBOR plus 0.36% Notes Due May 20, 2019	750.0	1.92%	3-Month LIBOR + 0.360%
Floating-Rate Three-Month LIBOR plus 0.45% Notes Due May 20, 2020	500.0	1.98%	3-Month LIBOR + 0.450%
Floating-Rate Three-Month LIBOR plus 0.55% Notes Due May 20, 2020	250.0	2.04%	3-Month LIBOR + 0.550%
Floating-Rate Three-Month LIBOR plus 0.73% Notes Due January 30, 2023	500.0	2.17%	3-Month LIBOR + 0.730%
Unsecured Commercial Paper Program	$2,000.0	1.28%	NA

Capitalization Summary

	Amount	% of Total Capitalization	Weighted Average Coupon
Cash & Cash Equivalents	$33,362.0		
Commercial Paper	2,000.0	4.3%	1.3%
Senior Notes	21,000.0	44.8%	2.9%
Total Debt	**$23,000.0**	**49.0%**	
Shareholders' Equity	$23,924.0	51.0%	
Total Capitalization	**46,924.0**	**100.0%**	
Net Debt	($10,362.0)		

Debt/Equity	**96.1%**
Debt/Total Capitalization	**49.0%**
Blended Yield of Debt Instruments	**2.8%**

Qualcomm Peer Capitalization

($ in millions, as of most recent FQ)

Advanced Micro Devices

Description	Amount	% of Total Debt	Coupon
2.125% Convertible Senior Notes Due 2026	$805.0	46.3%	2.13%
6.75% Senior Notes Due 2019	191.0	11.0%	6.75%
7.00% Senior Notes Due 2024	324.0	18.7%	7.00%
7.50% Senior Notes Due 2022	347.0	20.0%	7.50%
Secured Revolving Line of Credit	$70.0	4.0%	4.75%
Blended Yield of Debt Instruments			**4.7%**

Broadcom

Description	Amount	% of Total Debt	Coupon
Fixed Rate 2.200% Notes Due January 2021	$750.0	4.2%	2.20%
Fixed Rate 2.375% Notes Due January 2020	2,750.0	15.5%	2.38%
Fixed Rate 2.650% Notes Due January 2023	1,000.0	5.7%	2.65%
Fixed Rate 2.70% Notes Due November 2018	117.0	0.7%	2.70%
Fixed Rate 3.000% Notes Due January 2022	3,500.0	19.8%	3.00%
Fixed Rate 3.125% Notes Due January 2025	1,000.0	5.7%	3.13%
Fixed Rate 3.500% Notes Due January 2028	1,250.0	7.1%	3.50%
Fixed Rate 3.625% Notes Due January 2024	2,500.0	14.1%	3.63%
Fixed Rate 3.875% Notes Due January 2027	4,800.0	27.1%	3.88%
Fixed Rate Notes Due August 2022	9.0	0.1%	2.50%
Fixed Rate Notes Due August 2022	6.0	0.0%	4.50%
Fixed Rate Notes Due August 2024	$7.0	0.0%	3.50%
Blended Yield of Debt Instruments			**3.2%**

NVIDIA

Description	Amount	% of Total Debt	Coupon
1.00% Convertible Senior Notes	$24.0	1.2%	1.00%
2.20% Notes Due 2021	1,000.0	49.4%	2.20%
3.20% Notes Due 2026	$1,000.0	49.4%	3.20%
Blended Yield of Debt Instruments			**2.7%**

Xilinx

Description	Amount	% of Total Debt	Coupon
Fixed Rate 2019 Notes	$500.0	28.6%	2.13%
Fixed Rate 2021 Notes	500.0	28.6%	3.00%
Fixed Rate 2024 Notes	$750.0	42.9%	2.95%
Blended Yield of Debt Instruments			**2.7%**

Texas Instruments

Description	Amount	% of Total Debt	Coupon
Notes Due 2018 At 1.00%	$500.0	13.9%	1.00%
Notes Due 2019 At 1.65%	750.0	20.8%	1.65%
Notes Due 2020 At 1.75%	500.0	13.9%	1.75%
Notes Due 2021 At 2.75%	550.0	15.3%	2.75%
Notes Due 2022 At 1.85%	500.0	13.9%	1.85%
Notes Due 2023 At 2.25%	500.0	13.9%	2.25%
Notes Due 2024 At 2.625%	$300.0	8.3%	2.63%
Blended Yield of Debt Instruments			**1.9%**

Peer Cost of Debt Summary

Average	**3.1%**
Median	**2.7%**

Qualcomm Working Capital Schedule

($ in millions)

	Historical Period			Projection Period				
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Revenue	$25,281.0	$23,554.0	$22,291.0	$22,176.4	$22,810.6	$23,557.2	$24,263.9	$24,991.8
Cost of Goods Sold	10,106.0	9,315.0	9,355.0	9,092.3	9,237.5	9,539.8	9,826.0	10,120.8
Current Assets								
Accounts Receivable	$1,952.0	$2,214.0	$3,616.0	$3,341.6	$3,124.7	$2,904.3	$2,792.0	$2,670.4
Inventory	1,492.0	1,556.0	2,035.0	1,868.3	1,771.6	1,751.1	1,749.8	1,746.9
Other Current Assets	687.0	558.0	618.0	580.9	597.6	617.1	635.6	654.7
Total Current Assets	**$4,131.0**	**$4,328.0**	**$6,269.0**	**$5,790.9**	**$5,493.9**	**$5,272.6**	**$5,177.5**	**$5,071.9**
Current Liabilities								
Accounts Payable	$1,300.0	$1,858.0	$1,971.0	$1,818.5	$1,746.3	$1,725.0	$1,696.0	$1,691.4
Accrued Expenses	2,755.0	2,644.0	3,987.0	3,491.7	3,258.6	3,212.2	3,151.1	3,164.5
Other Current Liabilities	462.0	551.0	1,952.0	1,774.1	1,596.7	1,413.4	1,213.2	1,249.6
Total Current Liabilities	**$4,517.0**	**$5,053.0**	**$7,910.0**	**$7,084.3**	**$6,601.6**	**$6,350.7**	**$6,060.3**	**$6,105.5**
Net Working Capital	**($386.0)**	**($725.0)**	**($1,641.0)**	**($1,293.4)**	**($1,107.7)**	**($1,078.1)**	**($882.8)**	**($1,033.5)**
% revenue	*1.5%*	*3.1%*	*7.4%*	*5.8%*	*4.9%*	*4.6%*	*3.6%*	*4.1%*
Change in Net Working Capital		**$339.0**	**$916.0**	**($347.6)**	**($185.7)**	**($29.6)**	**($195.3)**	**$150.8**

Assumptions

Current Assets								
Days Sales Outstanding	28.2	34.3	59.2	55.0	50.0	45.0	42.0	39.0
Days Inventory Held	53.9	61.0	79.4	75.0	70.0	67.0	65.0	63.0
Other Current Assets (% of revenue)	2.7%	2.4%	2.8%	2.6%	2.6%	2.6%	2.6%	2.6%
Current Liabilities								
Days Payable Outstanding	47.0	72.8	76.9	73.0	69.0	66.0	63.0	61.0
Accrued Expenses (% OpEx)	35.6%	35.6%	50.8%	47.0%	44.0%	42.0%	40.0%	39.0%
Other Current Liabilities (% of revenue)	1.8%	2.3%	8.8%	8.0%	7.0%	6.0%	5.0%	5.0%

Qualcomm Comparable Company Analysis by Business Model - High Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
QUALCOMM Incorporated	**$97,200.7**	**$84,643.7**	**$22,360.0**	**$6,144.0**	**($2.83)**	**$21,934.8**	**$7,471.1**	**$3.44**	**57.3%**	**27.5%**	**(18.64%)**	**(5.96%)**	**(28.17%)**	**-**	**3.75x**	**11.00x**	**18.62x**
Tier I: Fabrication-less Semiconductor Suppliers																	
Broadcom Limited	$100,048.2	$109,293.2	$17,636.0	$7,524.0	$4.03	$21,039.6	$11,555.7	$19.94	62.6%	42.7%	9.6%	33.2%	50.2%	-	5.0x	9.1x	11.8x
Advanced Micro Devices, Inc.	11,268.8	11,478.8	5,329.0	348.0	0.04	6,305.3	628.4	0.37	34.2%	6.5%	0.8%	24.7%	-	-	1.8x	17.7x	30.3x
NVIDIA Corporation	138,186.2	133,078.2	9,714.0	3,404.3	4.82	12,354.3	4,627.3	6.80	59.9%	35.0%	31.4%	40.6%	59.5%	82.9%	11.0x	29.3x	34.1x
Marvell Technology Group Ltd.	10,870.3	9,138.3	2,376.8	554.3	0.57	2,473.9	740.8	1.28	60.0%	23.3%	16.5%	4.5%	79.0%	271.8%	3.6x	11.9x	16.6x
Xilinx, Inc	$16,593.60	$14,794.00	$2,475.60	$791.80	$1.92	$2,652.43	$841.81	$2.84	69.9%	32.0%	20.2%	7.1%	3.2%	(18.6%)	5.6x	17.7x	23.0x
Mean									**57.3%**	**27.9%**	**15.7%**	**22.0%**	**48.0%**	**112.0%**	**5.4x**	**17.1x**	**23.2x**
Median									**60.0%**	**32.0%**	**16.5%**	**24.7%**	**54.9%**	**82.9%**	**5.0x**	**17.7x**	**23.0x**
Tier II: Integrated Device Manufacturers																	
Intel Corporation	$209,804.4	$222,615.4	$62,761.0	$26,360.3	$1.99	$64,839.9	$26,983.2	$3.56	62.3%	42.0%	15.3%	5.7%	15.2%	(6.9%)	3.4x	8.1x	12.3x
Texas Instruments Incorporated	100,223.2	99,831.2	14,961.0	6,951.0	3.61	15,704.0	7,338.8	5.13	64.3%	46.5%	24.6%	11.9%	21.9%	2.4%	6.3x	13.4x	19.6x
Samsung Electronics Co., Ltd.	278,737.1	218,921.0	221,186.2	68,540.2	-	241,586.5	82,879.1	325.41	46.0%	31.0%	17.6%	18.7%	50.9%	88.2%	0.9x	2.6x	6.3x
Micron Technology, Inc.	48,784.9	52,540.9	23,155.0	12,902.0	6.40	28,913.7	17,222.7	10.16	48.7%	55.7%	32.8%	77.9%	284.0%	-	1.8x	2.9x	4.0x
Infineon Technologies AG	30,360.7	29,743.2	8,831.2	2,276.2	0.90	9,312.2	2,582.1	1.17	37.2%	25.8%	11.6%	9.6%	16.8%	10.9%	3.1x	11.3x	22.6x
Analog Devices, Inc.	$31,695.90	$38,499.20	$5,107.50	$2,117.20	$2.07	$5,899.21	$2,730.10	$5.20	67.0%	41.5%	14.2%	49.3%	69.3%	(15.6%)	6.5x	14.0x	16.2x
Mean									**54.3%**	**40.4%**	**19.4%**	**28.8%**	**76.3%**	**15.8%**	**3.6x**	**8.7x**	**13.5x**
Median									**55.5%**	**41.8%**	**16.5%**	**15.3%**	**36.4%**	**2.4%**	**3.2x**	**9.7x**	**14.2x**
Tier III: Pure-play Semiconductor Manufacturers																	
Microchip Technology Incorporated	$19,455.2	$21,395.2	$3,881.2	$1,532.4	$1.01	$4,109.4	$1,784.4	$5.71	60.1%	39.5%	6.3%	26.7%	74.0%	158.3%	5.1x	11.7x	14.2x
Western Digital Corporation	24,501.1	30,249.1	20,008.0	5,400.0	1.28	20,883.7	6,754.4	13.24	35.5%	27.0%	1.9%	25.7%	88.2%	-	1.4x	4.4x	6.1x
STMicroelectronics N.V.	$18,631.1	$18,195.5	$8,347.0	$1,666.0	$0.89	$9,440.1	$2,112.8	$1.26	39.2%	20.0%	9.6%	19.7%	66.4%	386.1%	1.9x	8.5x	16.8x
Mean									**44.9%**	**28.8%**	**6.0%**	**24.0%**	**76.2%**	**272.2%**	**2.8x**	**8.2x**	**12.4x**
Median									**39.2%**	**27.0%**	**6.3%**	**25.7%**	**74.0%**	**272.2%**	**1.9x**	**8.5x**	**14.2x**
Overall																	
Mean									**53.4%**	**33.5%**	**15.2%**	**25.4%**	**67.6%**	**95.9%**	**4.1x**	**11.6x**	**16.7x**
Median									**60.0%**	**33.5%**	**14.8%**	**22.2%**	**59.5%**	**46.9%**	**3.5x**	**11.5x**	**16.4x**
High									**69.9%**	**55.7%**	**32.8%**	**77.9%**	**284.0%**	**386.1%**	**11.0x**	**29.3x**	**34.1x**
Low									**34.2%**	**6.5%**	**0.8%**	**4.5%**	**3.2%**	**(18.6%)**	**0.9x**	**2.6x**	**4.0x**

EBITDA Valuation Output	
NTM EBITDA	$7,471.1
NTM EBITDA Multiple Range	17.1x
Implied Enterprise Value	**$128,054.1**
Less: Total Debt	(23,000.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$33,362.0
Implied Equity Value	**$138,416.1**
Shares Outstanding	1,476.8
Implied Share Price	**$93.73**

Revenue Valuation Output	
NTM Revenue	$21,934.8
Average NTM Revenue Multiple	5.4x
Implied Enterprise Value	**$118,097.2**
Less: Total Debt	(23,000.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$33,362.0
Implied Equity Value	**$128,459.2**
Shares Outstanding	1,476.8
Implied Share Price	**$86.99**

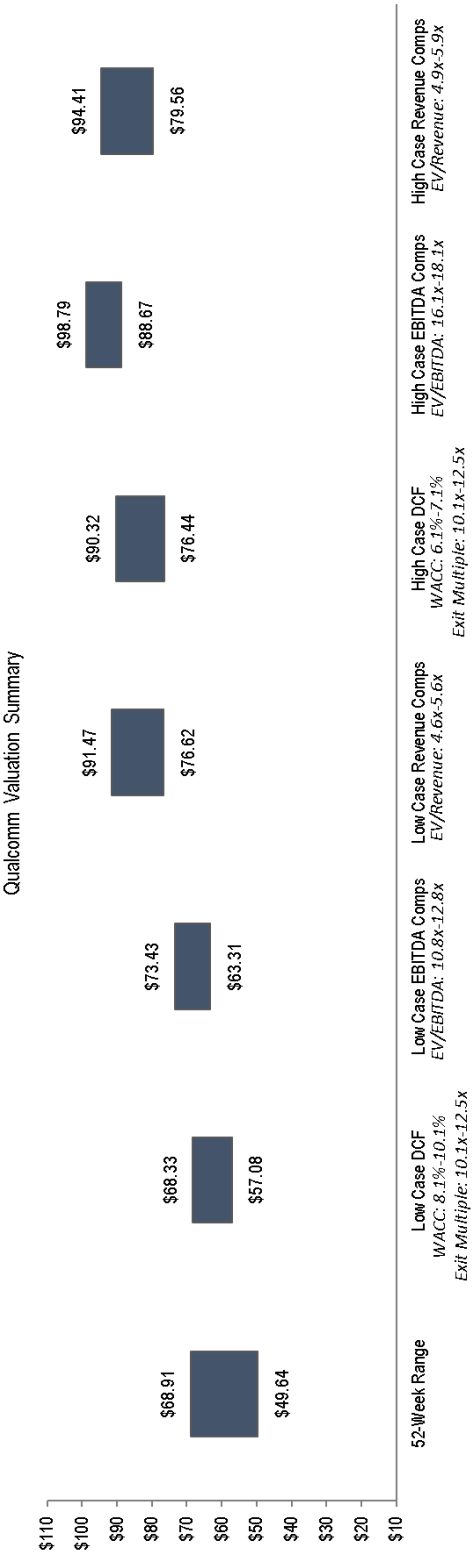
Qualcomm Comparable Company Analysis by Financial Profile - Low Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			NTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
QUALCOMM Incorporated	**$97,200.7**	**$84,643.7**	**$22,360.0**	**$6,144.0**	**($2.83)**	**$21,934.8**	**$7,471.1**	**$3.44**	**57.3%**	**27.5%**	**(18.6%)**	**(6.0%)**	**(28.2%)**	**-**	**3.8x**	**11.0x**	**18.6x**
Tier I: Similar Size, Margin, and Growth Profile																	
Broadcom Limited	$100,048.2	$109,293.2	$17,636.0	$7,524.0	$4.03	$21,039.6	$11,555.7	$19.94	62.6%	42.7%	9.6%	33.2%	50.2%	-	5.0x	9.1x	11.8x
Texas Instruments Incorporated	100,223.2	99,831.2	14,961.0	6,951.0	3.61	15,704.0	7,338.8	5.13	64.3%	46.5%	24.6%	11.9%	21.9%	2.4%	6.3x	13.4x	19.6x
NVIDIA Corporation	138,186.2	133,078.2	9,714.0	3,404.3	4.82	12,354.3	4,627.3	6.80	59.9%	35.0%	31.4%	40.6%	59.5%	82.9%	11.0x	29.3x	34.1x
Western Digital Corporation	24,501.1	30,249.1	20,008.0	5,400.0	1.28	20,883.7	6,754.4	13.24	35.5%	27.0%	1.9%	25.7%	88.2%	-	1.4x	4.4x	6.1x
Micron Technology, Inc.	$48,784.9	$52,540.9	$23,155.0	$12,902.0	$6.40	$28,913.7	$17,222.7	$10.16	48.7%	55.7%	32.8%	77.9%	284.0%	-	1.8x	2.9x	4.0x
Mean									**54.2%**	**41.4%**	**20.1%**	**37.8%**	**100.8%**	**42.7%**	**5.1x**	**11.8x**	**15.1x**
Median									**59.9%**	**42.7%**	**24.6%**	**33.2%**	**59.5%**	**42.7%**	**5.0x**	**9.1x**	**11.8x**
Tier II: Too Small																	
Advanced Micro Devices, Inc.	$11,268.8	$11,478.8	$5,329.0	$348.0	$0.04	$6,305.3	$628.4	$0.37	34.2%	6.5%	0.8%	24.7%	-	-	1.8x	17.7x	30.3x
Marvell Technology Group Ltd.	10,870.3	9,138.3	2,376.8	554.3	0.57	2,473.9	740.8	1.28	60.0%	23.3%	16.5%	4.5%	79.0%	271.8%	3.6x	11.9x	16.6x
Xilinx, Inc	16,593.6	14,794.0	2,475.6	791.8	1.92	2,652.4	841.8	2.84	69.9%	32.0%	20.2%	7.1%	3.2%	(18.6%)	5.6x	17.7x	23.0x
Microchip Technology Incorporated	19,455.2	21,395.2	3,881.2	1,532.4	1.01	4,109.4	1,784.4	5.71	60.1%	39.5%	6.3%	26.7%	74.0%	158.3%	5.1x	11.7x	14.2x
Infineon Technologies AG	30,360.7	29,743.2	8,831.2	2,276.2	0.90	9,312.2	2,582.1	1.17	37.2%	25.8%	11.6%	9.6%	16.8%	10.9%	3.1x	11.3x	22.6x
Analog Devices, Inc.	31,695.9	38,499.2	5,107.5	2,117.2	2.07	5,899.2	2,730.1	5.20	67.0%	41.5%	14.2%	49.3%	69.3%	(15.6%)	6.5x	14.0x	16.2x
STMicroelectronics N.V.	$18,631.1	$18,195.5	$8,347.0	$1,666.0	$0.89	$9,440.1	$2,112.8	$1.26	39.2%	20.0%	9.6%	19.7%	66.4%	386.1%	1.9x	8.5x	16.8x
Mean									**52.5%**	**26.9%**	**11.3%**	**20.2%**	**51.4%**	**132.1%**	**3.9x**	**13.2x**	**19.9x**
Median									**60.0%**	**25.8%**	**11.6%**	**19.7%**	**67.9%**	**84.6%**	**3.6x**	**11.9x**	**16.8x**
Tier III: Too Large																	
Intel Corporation	$209,804.4	$222,615.4	$62,761.0	$26,360.3	$1.99	$64,839.9	$26,983.2	$3.56	62.3%	42.0%	15.3%	5.7%	15.2%	(6.9%)	3.4x	8.1x	12.3x
Samsung Electronics Co., Ltd.	278,737.1	218,921.0	221,186.2	68,540.2	-	241,586.5	82,879.1	325.41	46.0%	31.0%	17.6%	18.7%	50.9%	88.2%	0.9x	2.6x	6.3x
Mean									**54.2%**	**36.5%**	**16.5%**	**12.2%**	**33.1%**	**40.6%**	**2.1x**	**5.3x**	**9.3x**
Median									**54.2%**	**36.5%**	**16.5%**	**12.2%**	**33.1%**	**40.6%**	**2.1x**	**5.3x**	**9.3x**
Overall																	
Mean									**53.4%**	**33.5%**	**15.2%**	**25.4%**	**67.6%**	**95.9%**	**4.1x**	**11.6x**	**16.7x**
Median									**60.0%**	**33.5%**	**14.8%**	**22.2%**	**59.5%**	**46.9%**	**3.5x**	**11.5x**	**16.4x**
High									**69.9%**	**55.7%**	**32.8%**	**77.9%**	**284.0%**	**386.1%**	**11.0x**	**29.3x**	**34.1x**
Low									**34.2%**	**6.5%**	**0.8%**	**4.5%**	**3.2%**	**(18.6%)**	**1.4x**	**2.9x**	**4.0x**

EBITDA Valuation Output	
NTM EBITDA	$7,471.1
Average NTM EBITDA Multiple	11.8x
Implied Enterprise Value	**$88,412.6**
Less: Total Debt	(23,000.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$33,362.0
Implied Equity Value	**$98,774.6**
Shares Outstanding	1,476.8
Implied Share Price	**$66.89**

Revenue Valuation Output	
NTM Revenue	$21,934.8
Average NTM Revenue Multiple	5.1x
Implied Enterprise Value	**$111,560.6**
Less: Total Debt	(23,000.0)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$33,362.0
Implied Equity Value	**$121,922.6**
Shares Outstanding	1,476.8
Implied Share Price	**$82.56**


Qualcomm Valuation Summary
$110
$100
$90
$80
$70
$60
$50
$40
$30
$20
$10
$68.91
$49.64
$68.33
$57.08
$73.43
$63.31
$91.47
$76.62
$90.32
$76.44
$98.79
$88.67
$94.41
$79.56
52-Week Range
Low Case DCF
WACC: 8.1%-10.1%
Exit Multiple: 10.1x-12.5x
Low Case EBITDA Comps
EV/EBITDA: 10.8x-12.8x
Low Case Revenue Comps
EV/Revenue: 4.6x-5.6x
High Case DCF
WACC: 6.1%-7.1%
Exit Multiple: 10.1x-12.5x
High Case EBITDA Comps
EV/EBITDA: 16.1x-18.1x
High Case Revenue Comps
EV/Revenue: 4.9x-5.9x

Zillow Discounted Cash Flow Analysis - High Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$644.7**	**$846.6**	**$1,076.8**	*29.3%*	**$1,306.2**	**$1,550.3**	**$1,763.0**	**$2,005.0**	**$2,205.5**	*14.1%*
% growth	*NA*	*31.3%*	*27.2%*		*21.3%*	*18.7%*	*13.7%*	*10.0%*	*7.0%*	
Cost Of Goods Sold	60.1	69.3	85.2		98.0	116.3	123.4	140.3	154.4	
% revenue	*9.3%*	*8.2%*	*7.9%*		*7.5%*	*7.5%*	*7.0%*	*7.0%*	*7.0%*	
Gross Profit	**$584.6**	**$777.3**	**$991.6**	*30.2%*	**$1,208.3**	**$1,434.0**	**$1,639.6**	**$1,864.6**	**$2,051.1**	*14.1%*
% margin	*90.7%*	*91.8%*	*92.1%*		*92.5%*	*92.5%*	*93.0%*	*93.0%*	*93.0%*	
Selling General & Admin (1)	441.6	495.1	588.9		653.1	713.1	740.5	781.9	816.0	
% revenue	*68.5%*	*58.5%*	*54.7%*		*50.0%*	*46.0%*	*42.0%*	*39.0%*	*37.0%*	
R & D Exp.	184.5	255.6	320.0		352.7	403.1	440.8	481.2	507.3	
% of revenue	*28.6%*	*30.2%*	*29.7%*		*27.0%*	*26.0%*	*25.0%*	*24.0%*	*23.0%*	
EBITDA	**($41.5)**	**$26.6**	**$82.7**	*NA*	**$202.5**	**$317.8**	**$458.4**	**$601.5**	**$727.8**	*37.7%*
% margin	*(6.4%)*	*3.1%*	*7.7%*		*15.5%*	*20.5%*	*26.0%*	*30.0%*	*33.0%*	
Depreciation & Amort.	51.5	60.5	70.1		120.2	128.9	138.2	147.0	164.2	
% of SG&A	*11.7%*	*12.2%*	*11.9%*		*18.4%*	*18.1%*	*18.7%*	*18.8%*	*20.1%*	
EBIT	**($93.0)**	**($33.9)**	**$12.6**	*NA*	**$82.3**	**$188.9**	**$320.2**	**$454.4**	**$563.6**	*61.8%*
% margin	*(14.4%)*	*(4.0%)*	*1.2%*		*6.3%*	*12.2%*	*18.2%*	*22.7%*	*25.6%*	
Taxes	(4.6)	0.1	(89.6)		12.3	28.3	48.0	68.2	84.5	
% tax rate implied	*4.9%*	*NA*	*NA*		*15%*	*15%*	*15%*	*15%*	*15%*	
EBIAT	**($88.4)**	**($34.0)**	**$102.2**	*NA*	**$70.0**	**$160.6**	**$272.1**	**$386.3**	**$479.1**	*61.8%*
Plus: D&A	51.5	60.5	70.1		120.2	128.9	138.2	147.0	164.2	
Less: Capital Expenditures	52.7	62.1	66.7		72.7	79.1	95.6	115.4	126.2	
% of revenue	*8.2%*	*7.3%*	*6.2%*		*5.6%*	*5.1%*	*5.4%*	*5.8%*	*5.7%*	
Less: Change in Net Working Capital		(4.7)	17.5		6.8	0.6	(3.5)	5.0	1.6	
Unlevered Free Cash Flow		**($30.9)**	**$88.1**		**$110.7**	**$209.8**	**$318.2**	**$412.9**	**$515.5**	
WACC				6.1%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.97	0.91	0.86	0.81	0.77	
Present Value of Free Cash Flow					**$107.4**	**$191.9**	**$274.3**	**$335.4**	**$394.5**	

Enterprise Value	
Cumulative Present Value of FCF	**$1,303.5**
Terminal Value	
Terminal Year EBITDA (2022E)	$727.8
Exit Multiple	21.6x
Terminal Value	**$15,698.79**
Discount Factor	0.74
Present Value of Terminal Value	**$11,663.5**
% of Enterprise Value	*89.9%*
Enterprise Value	**$12,967.1**

Implied Equity Value and Share Price	
Enterprise Value	$12,967.1
Less: Total Debt	(385.4)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$762.5
Implied Equity Value	**$13,344.2**
Shares Outstanding	186.5
Implied Share Price	**$71.55**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$515.5
WACC	6.1%
Terminal Value	$15,698.8
Implied Perpetuity Growth Rate	**2.7%**

Implied EV/EBITDA	
Enterprise Value	$12,967.1
LTM EBITDA	82.7
Implied EV/EBITDA	**156.8x**

(1) Income Statement SG&A less D&A

Zillow Weighted Average Cost of Capital - High Case

($ in millions, as of FQ1 2018)

WACC Calculation

Peer Capital Structure	
Debt-to-Total Capitalization	34.3%
Equity-to-Total Capitalizaion	65.7%
Current Cost of Debt	
Cost-of-Debt	2.02%
Tax Rate	21.0%
After Tax Cost of Debt	**1.6%**
Cost of Equity	
Risk-free Rate (1)	2.91%
Expected Market Return (2)	9.17%
Market Risk Premium	6.26%
Levered Beta	0.89
Cost of Equity	**8.5%**
WACC	**6.1%**

Comparable Companies Unlevered Beta

Company	Adjusted Levered Beta (3)	Market Value of Debt	Market Value of Equity	Debt/Equity	Marginal Tax Rate	Unlevered Beta
TrueCar	1.39	$29.1	$313.1	9.3%	21%	1.29
Cars.com	1.10	618.6	1,506.5	41.1%	21%	0.83
GrubHub	0.61	173.6	1,117.8	15.5%	21%	0.54
TripAdvisor	0.64	321.0	1,363.0	23.6%	21%	0.54
Expedia	1.22	$4,249.1	$6,150.9	69.1%	21%	0.79
Mean	**0.99**			**31.7%**		**0.80**
Median	**1.10**			**23.6%**		**0.79**

Adobe Relevered Beta

	Mean Unlevered Beta	Debt/Equity	Marginal Tax Rate	Relevered Beta
Relevered Beta	0.80	14.5%	21%	**0.89**

(1) 10-year U.S. Treasury sourced from Bloomberg
(2) Most Recent Annual Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Zillow Discounted Cash Flow Analysis - Low Case

($ in millions)

	Historical Period			CAGR	Projection Period					CAGR
	2015	2016	2017	('15-'17)	2018	2019	2020	2021	2022	('18-'22)
Revenue	**$644.7**	**$846.6**	**$1,076.8**	*29.3%*	**$1,306.2**	**$1,550.3**	**$1,763.0**	**$2,005.0**	**$2,205.5**	*14.1%*
% growth	*NA*	*31.3%*	*27.2%*		*21.3%*	*18.7%*	*13.7%*	*10.0%*	*7.0%*	
Cost Of Goods Sold	60.1	69.3	85.2		98.0	116.3	123.4	140.3	154.4	
% revenue	*9.3%*	*8.2%*	*7.9%*		*7.5%*	*7.5%*	*7.0%*	*7.0%*	*7.0%*	
Gross Profit	**$584.6**	**$777.3**	**$991.6**	*30.2%*	**$1,208.3**	**$1,434.0**	**$1,639.6**	**$1,864.6**	**$2,051.1**	*14.1%*
% margin	*90.7%*	*91.8%*	*92.1%*		*92.5%*	*92.5%*	*93.0%*	*93.0%*	*93.0%*	
Selling General & Admin (1)	441.6	495.1	588.9		653.1	713.1	740.5	781.9	816.0	
% revenue	*68.5%*	*58.5%*	*54.7%*		*50.0%*	*46.0%*	*42.0%*	*39.0%*	*37.0%*	
R & D Exp.	184.5	255.6	320.0		352.7	403.1	440.8	481.2	507.3	
% of revenue	*28.6%*	*30.2%*	*29.7%*		*27.0%*	*26.0%*	*25.0%*	*24.0%*	*23.0%*	
EBITDA	**($41.5)**	**$26.6**	**$82.7**	*NA*	**$202.5**	**$317.8**	**$458.4**	**$601.5**	**$727.8**	*37.7%*
% margin	*(6.4%)*	*3.1%*	*7.7%*		*15.5%*	*20.5%*	*26.0%*	*30.0%*	*33.0%*	
Depreciation & Amort.	51.5	60.5	70.1		120.2	128.9	138.2	147.0	164.2	
% of SG&A	*11.7%*	*12.2%*	*11.9%*		*18.4%*	*18.1%*	*18.7%*	*18.8%*	*20.1%*	
EBIT	**($93.0)**	**($33.9)**	**$12.6**	*NA*	**$82.3**	**$188.9**	**$320.2**	**$454.4**	**$563.6**	*61.8%*
% margin	*(14.4%)*	*(4.0%)*	*1.2%*		*6.3%*	*12.2%*	*18.2%*	*22.7%*	*25.6%*	
Taxes	(4.6)	0.1	(89.6)		12.3	28.3	48.0	68.2	84.5	
% tax rate implied	*4.9%*	*NA*	*NA*		*15%*	*15%*	*15%*	*15%*	*15%*	
EBIAT	**($88.4)**	**($34.0)**	**$102.2**	*NA*	**$70.0**	**$160.6**	**$272.1**	**$386.3**	**$479.1**	*61.8%*
Plus: D&A	51.5	60.5	70.1		120.2	128.9	138.2	147.0	164.2	
Less: Capital Expenditures	52.7	62.1	66.7		72.7	79.1	95.6	115.4	126.2	
% of revenue	*8.2%*	*7.3%*	*6.2%*		*5.6%*	*5.1%*	*5.4%*	*5.8%*	*5.7%*	
Less: Change in Net Working Capital		(4.7)	17.5		6.8	0.6	(3.5)	5.0	1.6	
Unlevered Free Cash Flow		**($30.9)**	**$88.1**		**$110.7**	**$209.8**	**$318.2**	**$412.9**	**$515.5**	
WACC				9.6%						
Discount Period					0.5	1.5	2.5	3.5	4.5	
Discount Factor					0.96	0.87	0.80	0.73	0.66	
Present Value of Free Cash Flow					**$105.7**	**$182.9**	**$253.3**	**$300.0**	**$341.9**	

Enterprise Value	
Cumulative Present Value of FCF	**$1,183.9**
Terminal Value	
Terminal Year EBITDA (2022E)	$727.8
Exit Multiple	11.2x
Terminal Value	**$8,144.2**
Discount Factor	0.63
Present Value of Terminal Value	**$5,160.8**
% of Enterprise Value	*81.3%*
Enterprise Value	**$6,344.8**

Implied Equity Value and Share Price	
Enterprise Value	$6,344.8
Less: Total Debt	(385.4)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$762.5
Implied Equity Value	**$6,721.9**
Shares Outstanding	186.5
Implied Share Price	**$36.04**

Implied Perpetuity Growth Rate	
Terminal Year FCF (2022E)	$515.5
WACC	9.6%
Terminal Value	$8,144.2
Implied Perpetuity Growth Rate	**2.7%**

Implied EV/EBITDA	
Enterprise Value	$6,344.8
LTM EBITDA	82.7
Implied EV/EBITDA	**76.7x**

(1) Income Statement SG&A less D&A

Zillow Weighted Average Cost of Capital - Low Case

($ in millions, as of FQ1 2018)

WACC Calculation	
Current Capital Structure	
Debt-to-Total Capitalization	12.7%
Equity-to-Total Capitalizaion	87.4%
Peer Cost of Debt	
Cost-of-Debt	4.25%
Tax Rate	21.0%
After Tax Cost of Debt	**3.4%**
Cost of Equity	
Risk-free Rate (1)	2.91%
Expected Market Return (2)	9.41%
Market Risk Premium	6.50%
Levered Beta	1.16
Cost of Equity	**10.5%**
WACC	**9.6%**

(1) 10-year U.S. Treasury sourced from Bloomberg
(2) Most Recent Quarterly Expected Market Return sourced from Bloomberg
(3) Sourced from Bloomberg

Zillow Capitalization

($ in millions, as of FQ1 2018)

Debt Outstanding

Description	Amount	Coupon	Floating Rate
2.00% Notes Is Due on December 1, 2021	$375.3	2.00%	NA
2.75% Notes Is Due on December 15, 2020	10.1	2.75%	NA

Capitalization Summary

	Amount	% of Total Capitalization	Weighted Average Coupon
Cash & Cash Equivalents	$762.5		
Senior Notes	385.4	12.7%	2.0%
Total Debt	**$385.4**	**12.7%**	
Shareholders' Equity	$2,660.8	87.3%	
Total Capitalization	**3,046.2**	**100.0%**	
Net Debt	($377.1)		

Debt/Equity	**14.5%**
Debt/Total Capitalization	**12.7%**
Blended Yield of Debt Instruments	**2.0%**

Zillow Peer Capitalization

($ in millions, as of most recent FQ)

TripAdvisor

Description	Amount	% of Total Debt	Coupon
One-Year Revolving Credit Facility with J.P.	$7.0	3.0%	5.00%
Unsecured Revolving Credit Facility	230.0	97.0%	2.74%
Blended Yield of Debt Instruments			**2.8%**

GoDaddy

Description	Amount	% of Total Debt	Coupon
Term Loan	$1,072.5	100.0%	4.90%
Blended Yield of Debt Instruments			**4.9%**

Match Group

Description	Amount	% of Total Debt	Coupon
6.375% Senior Notes Due June 1, 2024	$400.0	31.5%	6.38%
6.75% Senior Notes Due December 15, 2022	445.2	35.0%	6.75%
Term Loan Due November 16, 2022	$425.0	33.5%	3.81%
Blended Yield of Debt Instruments			**5.6%**

Groupon

Description	Amount	% of Total Debt	Coupon
Convertible Senior Notes	$250.0	100.0%	3.25%
Blended Yield of Debt Instruments			**3.3%**

Expedia

Description	Amount	% of Total Debt	Coupon
2.5% Senior Unsecured Notes Due 2022	$774.9	18.2%	2.50%
3.8% Senior Notes Due 2028	989.9	23.3%	3.80%
4.5% Senior Unsecured Notes Due 2024	495.2	11.7%	4.50%
5.0% Senior Unsecured Notes Due 2026	741.3	17.4%	5.00%
5.95% Senior Unsecured Notes Due 2020	747.8	17.6%	5.95%
7.456% Senior Unsecured Notes Due 2018	$500.0	11.8%	7.46%
Blended Yield of Debt Instruments			**4.7%**

Peer Cost of Debt Summary

Average	**4.3%**
Median	**4.7%**

Zillow Working Capital Schedule

($ in millions)

	Historical Period			Projection Period				
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Revenue	$644.7	$846.6	$1,076.8	$1,306.2	$1,550.3	$1,763.0	$2,005.0	$2,205.5
Cost of Goods Sold	60.1	69.3	85.2	98.0	116.3	123.4	140.3	154.4
Current Assets								
Accounts Receivable	29.8	40.5	54.4	$64.4	$74.7	$85.0	$96.6	$106.3
Prepaid Expenses	24.0	34.8	24.6	30.7	37.4	41.1	43.4	45.3
Total Current Assets	**$53.8**	**$75.3**	**$79.0**	**$95.1**	**$112.2**	**$126.1**	**$140.0**	**$151.6**
Current Liabilities								
Accounts Payable	$3.4	$4.3	$3.6	$4.6	$5.7	$6.4	$7.7	$8.5
Accrued Expenses	49.1	54.3	65.5	74.7	82.6	86.2	90.9	95.3
Unearned Revenue, Current	21.5	29.2	31.9	42.4	49.7	54.7	64.7	70.2
Other Current Liabilities	6.5	9.5	17.4	19.6	20.9	22.0	25.0	27.5
Total Current Liabilities	**$80.4**	**$97.2**	**$118.4**	**$141.3**	**$158.9**	**$169.4**	**$188.3**	**$201.5**
Net Working Capital	**($26.6)**	**($21.9)**	**($39.4)**	**($46.2)**	**($46.8)**	**($43.3)**	**($48.3)**	**($49.9)**
% revenue	*4.1%*	*2.6%*	*3.7%*	*3.5%*	*3.0%*	*2.5%*	*2.4%*	*2.3%*
Change in Net Working Capital		**($4.7)**	**$17.5**	**$6.8**	**$0.6**	**($3.5)**	**$5.0**	**$1.6**
Assumptions								
Current Assets								
Days Sales Outstanding	16.9	17.5	18.4	18.0	17.6	17.6	17.6	17.6
Prepaid Expenses (% of SG&A)	5.4%	7.0%	4.2%	4.7%	5.3%	5.5%	5.5%	5.5%
Current Liabilities								
Days Payable Outstanding	20.4	22.4	15.4	17.0	18.0	19.0	20.0	20.0
Accrued Expenses (% OpEx)	7.8%	7.2%	7.2%	7.4%	7.4%	7.3%	7.2%	7.2%
Unearned Revenue (% of revenue)	3.3%	3.4%	3.0%	3.2%	3.2%	3.1%	3.2%	3.2%
Other Current Liabilities (% of revenue)	1.0%	1.1%	1.6%	1.5%	1.4%	1.2%	1.2%	1.2%

Zillow Comparable Company Analysis by Business Model - High Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			LTM Multiples		NTM Multiples	
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	EV / Revenue	EV / EBITDA
Zillow Group, Inc.	**$9,039.9**	**$8,662.8**	**$1,076.8**	**$82.7**	**($0.51)**	**$1,306.2**	**$309.5**	**$0.82**	**92.1%**	**7.7%**	**(8.8%)**	**27.2%**	**210.3%**	**-**	**8.0x**	**104.8x**	**6.5x**	**27.2x**
Tier I: Internet Durable Goods Intermediaries																		
trivago N.V.	$2,770.7	$2,542.3	$1,274.9	($14.2)	($0.06)	$1,358.7	($9.8)	($0.07)	99.4%	(1.1%)	(1.2%)	37.3%	-	-	2.0x	NM	1.9x	NM
CarGurus, Inc.	3,814.0	3,676.3	316.9	19.1	0.12	400.11	27.89	0.16	94.4%	6.0%	4.2%	59.9%	79.2%	103.2%	11.6x	192.8x	8.6x	132.6x
TrueCar, Inc.	1,100.1	931.5	323.1	(24.8)	(0.35)	361.96	38.23	0.18	91.3%	(7.7%)	(10.2%)	16.5%	-	-	2.9x	NM	2.6x	24.4x
Redfin Corporation	1,752.5	1,546.2	370.0	(8.8)	(4.47)	470.11	6.23	(0.25)	30.2%	(2.4%)	(4.1%)	38.5%	-	-	4.2x	NM	3.1x	236.9x
Cars.com Inc.	$2,004.1	$2,595.3	$631.4	$218.6	$1.70	$669.6	$234.7	$1.08	78.1%	34.6%	19.2%	1.3%	(3.2%)	(28.0%)	4.1x	11.9x	3.8x	10.7x
Mean									**78.7%**	**5.9%**	**1.6%**	**30.7%**	**38.0%**	**37.6%**	**5.0x**	**102.4x**	**4.0x**	**101.1x**
Median									**91.3%**	**(1.1%)**	**(1.2%)**	**37.3%**	**38.0%**	**37.6%**	**4.1x**	**102.4x**	**3.1x**	**78.5x**
Tier II: Internet Service Intermediary																		
GrubHub Inc.	$8,694.1	$8,610.0	$683.1	$141.6	$1.12	$953.6	$249.8	$1.65	52.3%	20.7%	14.5%	38.5%	22.4%	99.7%	12.6x	60.8x	8.8x	33.7x
Pandora Media, Inc.	1,141.9	1,404.9	1,466.8	(289.0)	(2.29)	1,510.15	(101.89)	(0.54)	34.1%	(19.7%)	(35.3%)	5.9%	-	-	1.0x	NM	0.9x	NM
Yelp Inc.	3,656.3	2,835.1	846.8	56.2	1.75	953.58	182.94	1.19	91.7%	6.6%	18.1%	18.8%	161.1%	-	3.3x	50.5x	2.9x	15.0x
GoDaddy Inc.	8,128.5	10,021.0	2,231.9	299.7	0.71	2,599.12	714.09	2.79	65.3%	13.4%	6.1%	20.8%	42.6%	-	4.5x	33.4x	3.8x	13.7x
Match Group, Inc.	11,203.6	12,189.7	1,330.7	394.6	1.2	1,601.59	592.46	1.21	79.0%	29.7%	26.3%	8.9%	11.5%	104.2%	9.2x	30.9x	7.4x	19.9x
TripAdvisor, Inc.	5,516.3	5,129.3	1,556.0	173.0	(0.14)	1,605.75	331.28	1.16	95.4%	11.1%	(1.2%)	5.1%	(19.5%)	-	3.3x	29.6x	3.2x	15.5x
Groupon, Inc.	2,397.7	1,752.7	2,843.9	111.8	0.03	2,644.48	262.49	0.20	46.9%	3.9%	0.5%	(5.6%)	673.1%	-	0.6x	15.7x	0.7x	6.6x
Expedia, Inc.	$15,894.9	$18,457.3	$10,059.8	$1,158.8	$2.42	$11,284.9	$1,851.7	$4.73	82.5%	11.5%	3.8%	14.7%	8.0%	34.1%	1.8x	15.9x	1.6x	9.9x
Mean									**68.4%**	**9.7%**	**4.1%**	**13.4%**	**128.5%**	**79.4%**	**4.5x**	**33.8x**	**3.7x**	**16.3x**
Median									**72.2%**	**11.3%**	**4.9%**	**11.8%**	**22.4%**	**99.7%**	**3.3x**	**30.9x**	**3.0x**	**15.0x**
Overall																		
Mean									**72.4%**	**8.2%**	**3.1%**	**20.0%**	**108.3%**	**62.6%**	**4.7x**	**49.1x**	**3.8x**	**47.2x**
Median									**79.0%**	**6.6%**	**3.8%**	**16.5%**	**22.4%**	**99.7%**	**3.3x**	**30.9x**	**3.1x**	**15.5x**
High									**99.4%**	**34.6%**	**26.3%**	**59.9%**	**673.1%**	**104.2%**	**12.6x**	**192.8x**	**8.8x**	**236.9x**
Low									**30.2%**	**(19.7%)**	**(35.3%)**	**(5.6%)**	**(19.5%)**	**(28.0%)**	**0.6x**	**11.9x**	**0.7x**	**6.6x**

EBITDA Valuation Output	
LTM EBITDA	$82.7
Average LTM EBITDA Multiple	102.4x
Implied Enterprise Value	**$8,464.3**
Less: Total Debt	(385.4)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$762.5
Implied Equity Value	**$8,841.4**
Shares Outstanding	186.5
Implied Share Price	**$47.41**

Revenue Valuation Output	
NTM Revenue	$1,306.2
Average NTM Revenue Multiple	5.0x
Implied Enterprise Value	**$6,478.9**
Less: Total Debt	(385.4)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$762.5
Implied Equity Value	**$6,856.0**
Shares Outstanding	186.5
Implied Share Price	**$36.76**

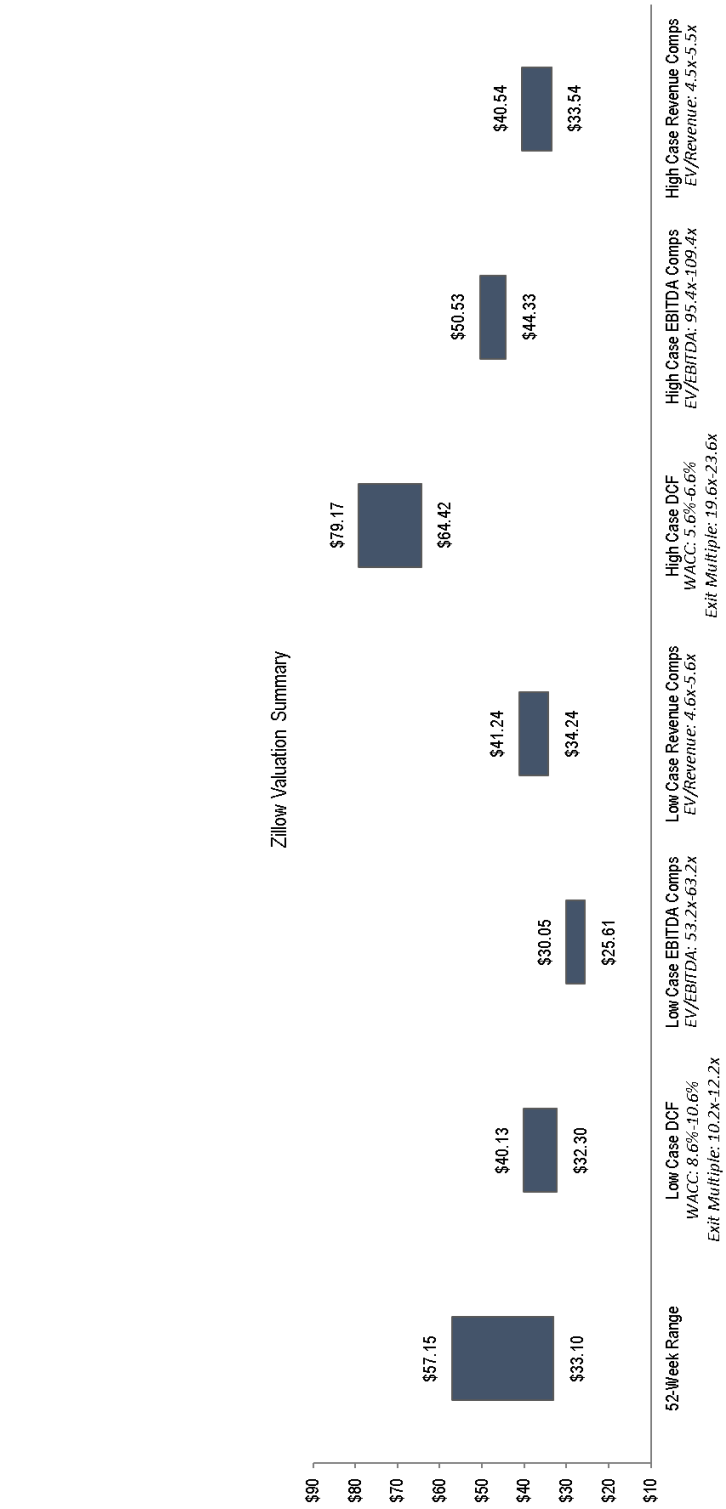
Zillow Comparable Company Analysis by Financial Profile - Low Case

($ in millions)

			LTM Financial Statistics			NTM Financial Statistics			LTM Profitability Margins			LTM Growth Rates			LTM Multiples		
Company	Equity Value	Enterprise Value	Revenue	EBITDA	EPS	Revenue	EBITDA	EPS	Gross Profit	EBITDA	Net Income	Revenue	EBITDA	Net Income	EV / Revenue	EV / EBITDA	P / EPS
Zillow Group, Inc.	**$9,039.9**	**$8,662.8**	**$1,076.8**	**$82.7**	**($0.51)**	**$1,306.2**	**$309.5**	**$0.82**	**92.1%**	**7.7%**	**(8.8%)**	**27.2%**	**210.3%**	**-**	**8.0x**	**104.8x**	**NM**
Tier I: Similar Size, Margin, and Growth Profile																	
GrubHub Inc.	$8,694.1	$8,610.0	$683.1	$141.6	$1.12	$953.6	$249.8	$1.65	52.3%	20.7%	14.5%	38.5%	22.4%	99.7%	12.6x	60.8x	89.0x
GoDaddy Inc.	8,128.5	10,021.0	2,231.9	299.7	0.71	2,599.12	714.09	2.79	65.3%	13.4%	6.1%	20.8%	42.6%	-	4.5x	33.4x	85.5x
TripAdvisor, Inc.	5,516.3	5,129.3	1,556.0	173.0	(0.14)	1,605.75	331.28	1.16	95.4%	11.1%	(1.2%)	5.1%	(19.5%)	-	3.3x	29.6x	NM
Yelp Inc.	3,656.3	2,835.1	846.8	56.2	1.75	953.58	182.94	1.19	91.7%	6.6%	18.1%	18.8%	161.1%	-	3.3x	50.5x	25.2x
trivago N.V.	$2,770.7	$2,542.3	$1,274.9	($14.2)	($0.06)	$1,358.7	($9.8)	($0.07)	99.4%	(1.1%)	(1.2%)	37.3%	-	-	2.0x	NM	NM
Mean									**80.8%**	**10.1%**	**7.2%**	**24.1%**	**51.6%**	**99.7%**	**5.1x**	**43.6x**	**66.6x**
Median									**91.7%**	**11.1%**	**6.1%**	**20.8%**	**32.5%**	**99.7%**	**3.3x**	**42.0x**	**85.5x**
Tier II: Different Size, Margin, and Growth Profile																	
CarGurus, Inc.	$3,814.0	$3,676.3	$316.9	$19.1	$0.12	$400.1	$27.9	$0.16	94.4%	6.0%	4.2%	59.9%	79.2%	103.2%	11.6x	192.8x	299.6x
TrueCar, Inc.	1,100.1	931.5	323.1	(24.8)	(0.35)	361.96	38.23	0.18	91.3%	(7.7%)	(10.2%)	16.5%	-	-	2.9x	NM	NM
Redfin Corporation	1,752.5	1,546.2	370.0	(8.8)	(4.47)	470.11	6.23	(0.25)	30.2%	(2.4%)	(4.1%)	38.5%	-	-	4.2x	NM	NM
Cars.com Inc.	2,004.1	2,595.3	631.4	218.6	1.7	669.55	234.66	1.08	78.1%	34.6%	19.2%	1.3%	(3.2%)	(28.0%)	4.1x	11.9x	16.5x
Pandora Media, Inc.	1,141.9	1,404.9	1,466.8	(289.0)	(2.29)	1,510.15	(101.89)	(0.54)	34.1%	(19.7%)	(35.3%)	5.9%	-	-	1.0x	NM	NM
Match Group, Inc.	11,203.6	12,189.7	1,330.7	394.6	1.2	1,601.59	592.46	1.21	79.0%	29.7%	26.3%	8.9%	11.5%	104.2%	9.2x	30.9x	34.0x
Groupon, Inc.	2,397.7	1,752.7	2,843.9	111.8	0.03	2,644.48	262.49	0.20	46.9%	3.9%	0.5%	(5.6%)	673.1%	-	0.6x	15.7x	149.2x
Expedia, Inc.	$15,894.9	$18,457.3	$10,059.8	$1,158.8	$2.42	$11,284.9	$1,851.7	$4.73	82.5%	11.5%	3.8%	14.7%	8.0%	34.1%	1.8x	15.9x	43.2x
Mean									**67.1%**	**7.0%**	**0.6%**	**17.5%**	**153.7%**	**53.4%**	**4.4x**	**53.4x**	**108.5x**
Median									**78.6%**	**5.0%**	**2.1%**	**11.8%**	**11.5%**	**68.6%**	**3.5x**	**15.9x**	**43.2x**
Overall																	
Mean									**72.4%**	**8.2%**	**3.1%**	**20.0%**	**108.3%**	**62.6%**	**4.7x**	**49.1x**	**92.8x**
Median									**79.0%**	**6.6%**	**3.8%**	**16.5%**	**22.4%**	**99.7%**	**3.3x**	**30.9x**	**64.4x**
High									**99.4%**	**34.6%**	**26.3%**	**59.9%**	**673.1%**	**104.2%**	**12.6x**	**192.8x**	**299.6x**
Low									**30.2%**	**(19.7%)**	**(35.3%)**	**(5.6%)**	**(19.5%)**	**(28.0%)**	**0.6x**	**11.9x**	**16.5x**

EBITDA Valuation Output	
LTM EBITDA	$82.7
75th Percentile LTM EBITDA Multiple	58.2x
Implied Enterprise Value	**$4,815.2**
Less: Total Debt	(385.4)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$762.5
Implied Equity Value	**$5,192.3**
Shares Outstanding	186.5
Implied Share Price	**$27.84**

Revenue Valuation Output	
LTM Revenue	$1,306.2
Average LTM Revenue Multiple	5.1x
Implied Enterprise Value	**$6,714.0**
Less: Total Debt	(385.4)
Less: Preferred Stock	- -
Less: Noncontrolling Interest	- -
Plus: Cash and Cash Equivalents	$762.5
Implied Equity Value	**$7,091.1**
Shares Outstanding	186.5
Implied Share Price	**$38.02**


Zillow Valuation Summary
$90
$80
$70
$60
$50
$40
$30
$20
$10
52-Week Range
$57.15
$33.10
Low Case DCF
WACC: 8.6%-10.6%
Exit Multiple: 10.2x-12.2x
$40.13
$32.30
Low Case EBITDA Comps
EV/EBITDA: 53.2x-63.2x
$30.05
$25.61
Low Case Revenue Comps
EV/Revenue: 4.6x-5.6x
$41.24
$34.24
High Case DCF
WACC: 5.6%-6.6%
Exit Multiple: 19.6x-23.6x
$79.17
$64.42
High Case EBITDA Comps
EV/EBITDA: 95.4x-109.4x
$50.53
$44.33
High Case Revenue Comps
EV/Revenue: 4.5x-5.5x
$40.54
$33.54

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