Yahoo! INC **Recommendation: BUY** **Potential Upside: 11.78%**	**Harry Barrett** Harry.Barrett@ucdconnect.ie **Killian Buckley** Killian.Buckley@ucdconnect.ie **May 2nd, 2016**

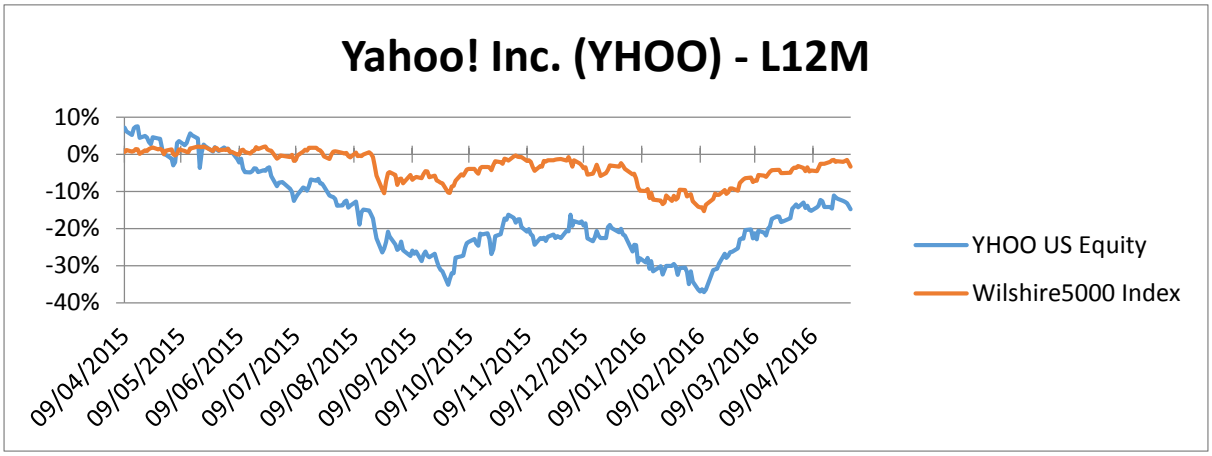

Figure 1

Key Financial Metrics			
($, Millions)	**2013**	**2014**	**2015**
Revenue	4,680.4	4,618.1	4,968.3
ROE	9.9 %	29.0%	-12.7%
Net Income Margin	29.6 %	29.9 %	4.2 %
EPS	$ 1.28	$ 1.32	$ 0.22
Current Price	$ 36.60		
52 Week Range	$ 45.10 - $ 26.15		
Target Value	$ 40.91		
Potential Upside	11.78 %		

Table 1

- **Please see the disclaimer at back of this report for important information.**
- Our **BUY** recommendation for Yahoo! Inc. (NASDAQ: YHOO) is based on our Discounted Cash Flow valuation which arrives at a target share price of $40.38, combined with the likelihood of a sale of the core business which would result in a cumulative value to shareholders (the stock price of the remaining entity post-sale, plus proceeds of sale of core business) of $40.97. A probability weighted target value for shareholders of $40.91 is arrived at through analysis of the two likely scenarios, outlined in Table 7, on page 15.
- Yahoo has undergone a period of declining revenue and gradual deterioration of market share, and management are keen to secure a sale of the core business. We believe this sale is in the best interests of both management and shareholders alike.

Company Profile

Yahoo! Inc (NASDAQ: YHOO) is an American multinational technology company founded in 1995, with headquarters in Sunnyvale, California. They are most widely known for their flagship web search engine *Yahoo Search*, and in recent years have expanded into additional communications and social media products. *Yahoo Search* provides users with the ability to search through web pages, news, images and various multimedia files. The company also provides additional services such as email hosting, detailed financial market analysis and fantasy sports services. These additional services have become increasingly popular in recent years and therefore vital to the company, as Yahoo has struggled to come up with innovative products like Google and other competitors have done in recent years, resulting in the business entering a gradual decline.

Our Outlook

Despite Yahoo's position as the world's most visited news and media website, the core business has been in a state of gradual decline for several years now. Recent data suggests that Yahoo reaches approximately three-quarters of the entire US internet population each month. Such an enormous audience in their domestic market, let alone further afield, means Yahoo should be showing signs of stronger performance than seen in recent years. This large audience is fragmented across their search, news, sports and entertainment streams and so this fragmentation should facilitate easier targeting of advertising.

Yahoo holds significant ownership stakes in *Alibaba* and *Yahoo Japan*, 15.5% and 35.5% respectively, and these have been significant drivers of share value in recent years. On a macro level, Yahoo should benefit from the increase in online advertising revenue in the US as well as globally, alongside growing broadband penetration rates and the demographics of their generally wealthy user base.

On April 18th 2016 Yahoo received the first round of bids for the sale of the company. This process could result in loss of value greater than what Yahoo has recently been experiencing, for example loss of top talent and excessive time spent analysing bids from potential acquirers. However, several years of poor performance despite a huge global user base leads us to believe that a sale of the company is the best option available, as a new owner may be able to rejuvenate the flagging core business. Management has stated that achieving a successful sale of the business is now a top priority.

In line with the ongoing auction for the company, we have conducted our valuation under two possible outcomes:

- A failed auction, in which case Yahoo will move forward under the status-quo,
- A successful bid is made for the core Yahoo business, leaving Yahoo as a holding company for the two significant stakes in *Alibaba* and *Yahoo Japan*.

We conduct a valuation under each scenario, and assign approximate probabilities to the likelihood of each scenario occurring as we see fit.

Forecasts

Revenue

Yahoo's revenue is primarily generated from display and search advertising. They create value for advertisers through using their data, content and technology to connect advertisers to their target audience. The lion's share of Yahoo's revenue is generated in the US, with the US market representing 74%, 76% and 80% of the group's total revenue for 2013, 2014 and 2015 respectively. The remaining revenue can be attributable to the EMEA and Asia-Pacific regions, representing 7% and 13% of group revenue for 2015 respectively. In recent years, Yahoo's share of the total US online advertising market has been decreasing at a gradual rate, and we believe this trend will continue in the near future, as we can see in Figure 2.

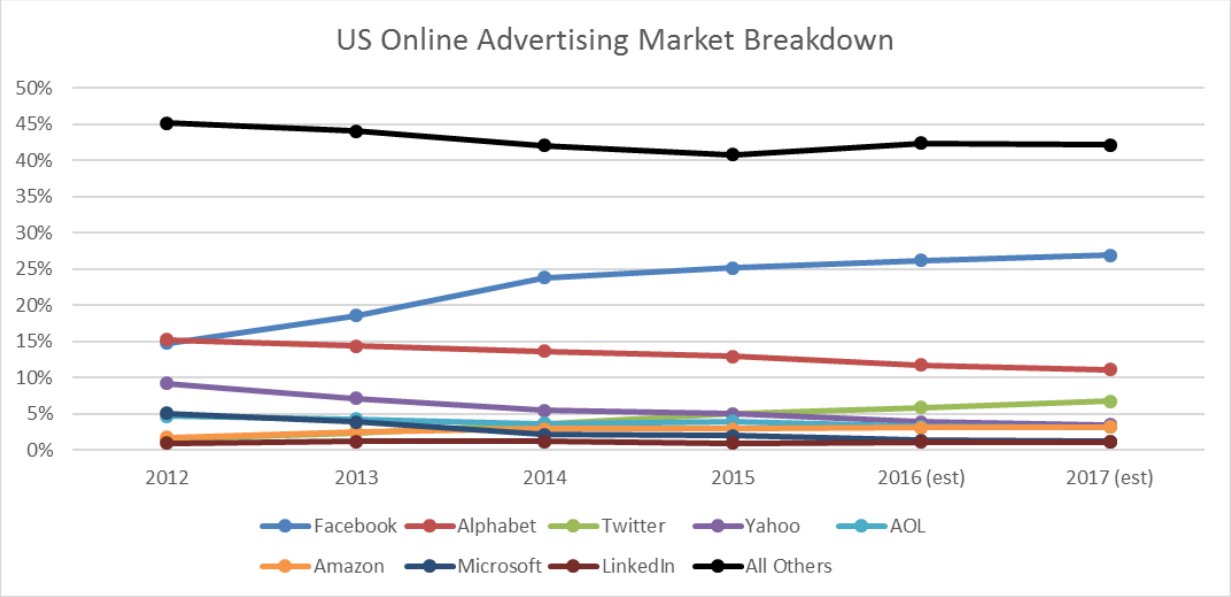

Figure 2: Source - eMarketer

Yahoo's market share now stands at just 5% for the end of 2015, and is projected to fall to 3.5% by 2017 as industry behemoth Facebook grows ever larger. Another significant barrier to market share improvement are Yahoo's Search and Services Agreements with both Microsoft and Google respectively. Microsoft is the non-exclusive provider of "algorithmic and paid search services for

Yahoo Properties and Affiliate sites on personal computers and the non-exclusive provider of such services on mobile devices", meaning that Yahoo must request paid search results from Microsoft for 51% of its search queries from devices accessing Yahoo Properties and Affiliate sites, and can only display Microsoft's paid search results on such pages. Approximately 35% of revenue for 2015 was dependant on this agreement.

Under the Services Agreement with Google entered into in late 2015, Yahoo is provided with search advertisements through Google's various search services. This represents yet another revenue stream whereby Yahoo has now become dependent on competitors for their own revenue growth. This is a risky strategy, as termination of either agreement by Microsoft or Google would significantly impact Yahoo in terms of revenue generation, unless they could act to replace this revenue organically. It also makes increasing market share increasingly unlikely, as Yahoo are dependent on the growth of these rivals for revenue increases, as well as their cooperation. Therefore, Yahoo's market share should remain particularly stagnant going forward.

In February 2016 Yahoo announced a Strategic Plan, whereby they will attempt to streamline the business, focus on core operations and improving their two core advertiser products, *Yahoo Gemini* and *Yahoo BrightRoll*. *Yahoo Gemini* is Yahoo's proprietary marketplace for search and native advertising across all devices, and *Yahoo BrightRoll* is Yahoo's unified brand for programmatic advertising technology, which helps advertisers connect with specific targeted users across different advertising formats. This strategic plan also places focus on increasing revenue generated through mobile devices, an area in which Yahoo is badly lagging behind. The extent of Yahoo's mobile revenue has only been properly disclosed by the company in recent years, and for 2015 mobile revenue represented approximately 20% of total advertising revenue. Mobile advertising revenue as a percentage of total advertising revenue was almost negligible before 2014. When we compare this to Alphabet Inc., for whom mobile revenue represents almost 80% of total advertising revenue, we can see how badly Yahoo has fallen behind. Increased focus on mobile revenue generation is a welcome announcement, however any gains will likely be offset by flagging performance across desktop platforms and the company's reliance on rivals for revenue generation.

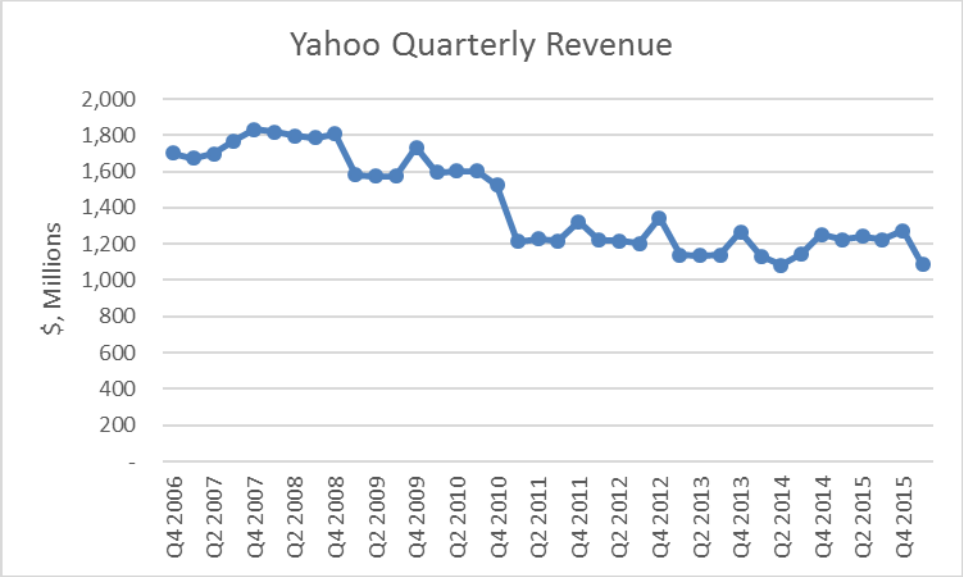

Figure 3

In Figure 3 above we can see Yahoo's total revenues broken down by quarter, since Q4 2006. We break revenues down by quarter in order to detect any seasonal trends in the data, and this does indeed appear to exist. We can often see a spike in revenues reported in the fourth quarter of each year. With this seasonality in mind, combined with the overall downward trend over the past nine years, we decided to forecast search and display revenues using a seasonal adjustment and exponential smoothing model, a full mathematical explanation of which can be found in **Appendix II**. We believe this is the best model to implement for such data, as it is designed to produce forecasts for series which contain seasonality and upward/downward trends such as this.

First we seasonally adjust the data, calculating a centered moving average. Forecasts are then generated for the seasonally adjusted data via linear exponential smoothing, and finally the seasonally adjusted forecasts are "re-seasonalised" to obtain forecasts for the original series. In Figure 4 below, we can see how our seasonal adjustment and exponential smoothing model performs in a historic context versus the actual quarterly revenue values, and our quarterly forecasts over our five-year estimation period.

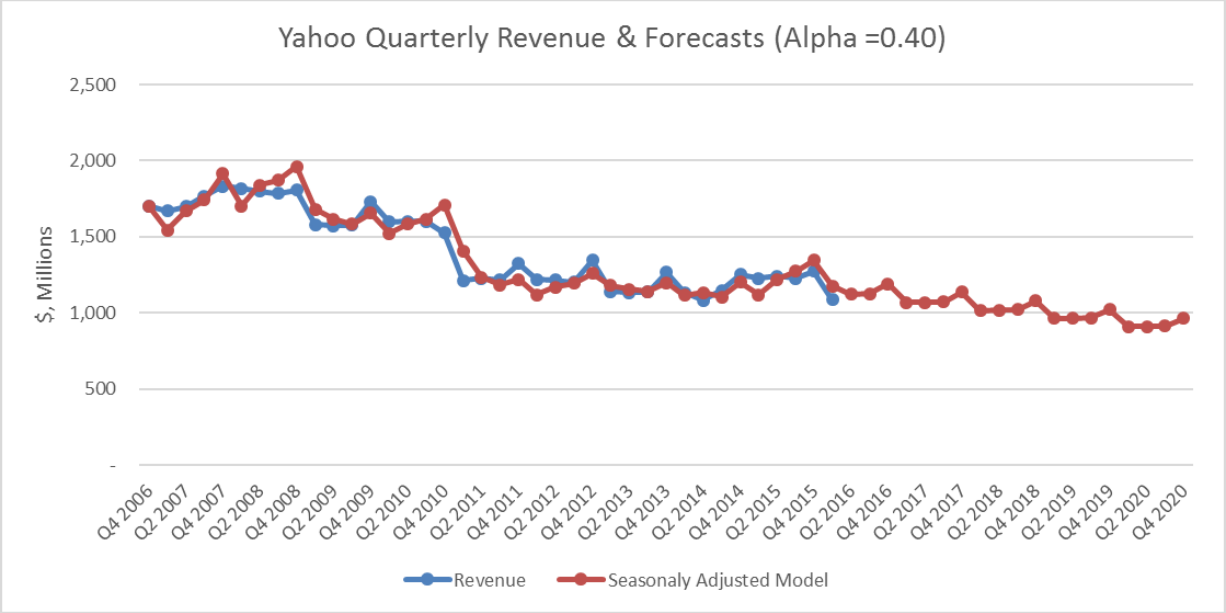

Figure 4

In Figure 4 we can see that our model generates particularly accurate forecasts for quarterly revenue, especially in recent years where the seasonality pattern has been particularly evident. Our forecasts going forward also capture the seasonality and downward trends well, and we believe that this model represents a respectable approximation for revenue generation over our forecast period. Figure 5 below shows the historic and forecasted revenue values on an annualised basis.

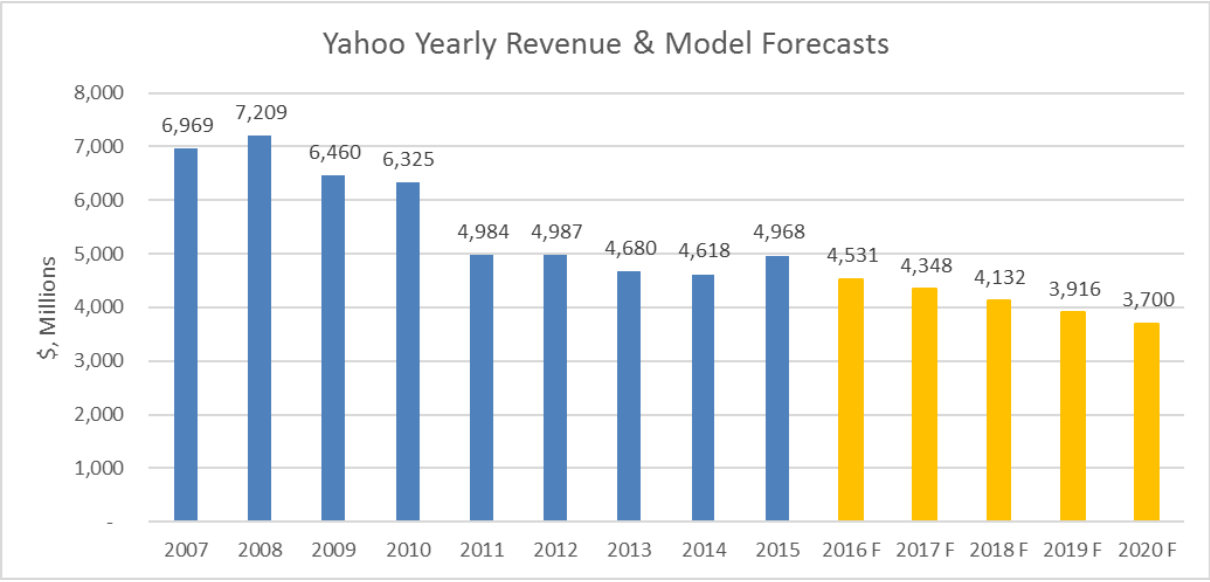

Figure 5

Figure 5 encompasses both search & display advertising revenues, as well as other revenue. Other revenue includes listings-based services revenue, transaction revenue, royalties and patient licences. Other revenue as a percentage of total group revenue stood at 21%, 21% and 16% for 2013, 2014

and 2015. We see no reason to believe that other revenue will deviate from its historic average of 19.3% of total group revenue throughout our forecast period.

Costs of Revenue

Traffic Acquisition Costs are the proportion of revenues shared with third-party entities who have integrated Yahoo advertising offerings into their websites, as well as payments made to companies that direct consumer and business traffic to Yahoo Properties. For the year ended December 31st 2015, TACs increased by $660 million compared to a $350 million increase in revenues, or 303% and 7.6% respectively, compared to 2014. The increase in revenue for the year ended December 31st 2015 was primarily attributable to an increase in search and display revenue resulting from an increase in revenue from distribution partners, including Mozilla Corporation. Yahoo entered into an agreement in November 2014 to compensate Mozilla for making Yahoo the default search provider on certain Mozilla products in the United States. Figure 6 provides a detailed breakdown of TACs since 2010.

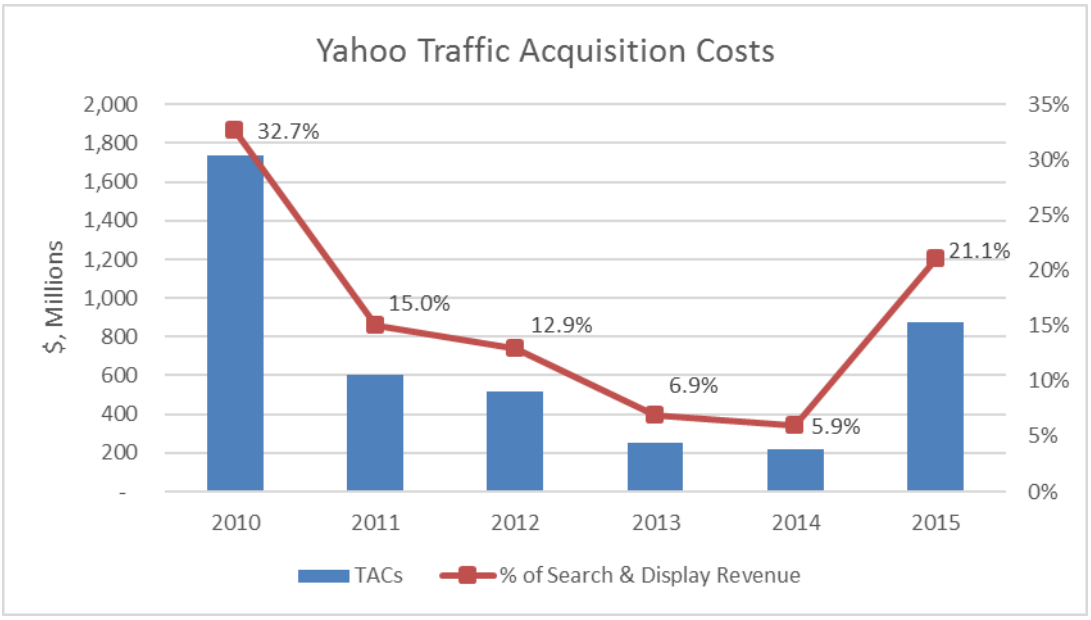

Figure 6

We believe that Yahoo's agreement with Mozilla Corporation, alongside their Search and Service Agreements with Microsoft and Google respectively, will keep TACs as a proportion of search and display advertising revenues approximately in line with the observed values for 2015. Yahoo's reliance on competitors for revenue generation will make it hard for them to reduce this figure by any significant amount, and therefore we keep it constant throughout our projection period at 20% of search and display revenues.

Other cost of revenues consists of bandwidth costs, stock-based compensation, content and other expenses associated with the production and usage of Yahoo Properties, including content expense and amortization of developed technology and patents. Other cost of revenue also includes costs for Yahoo's technology platforms and infrastructure, including depreciation expense and other operating costs, directly related to revenue generating activities.

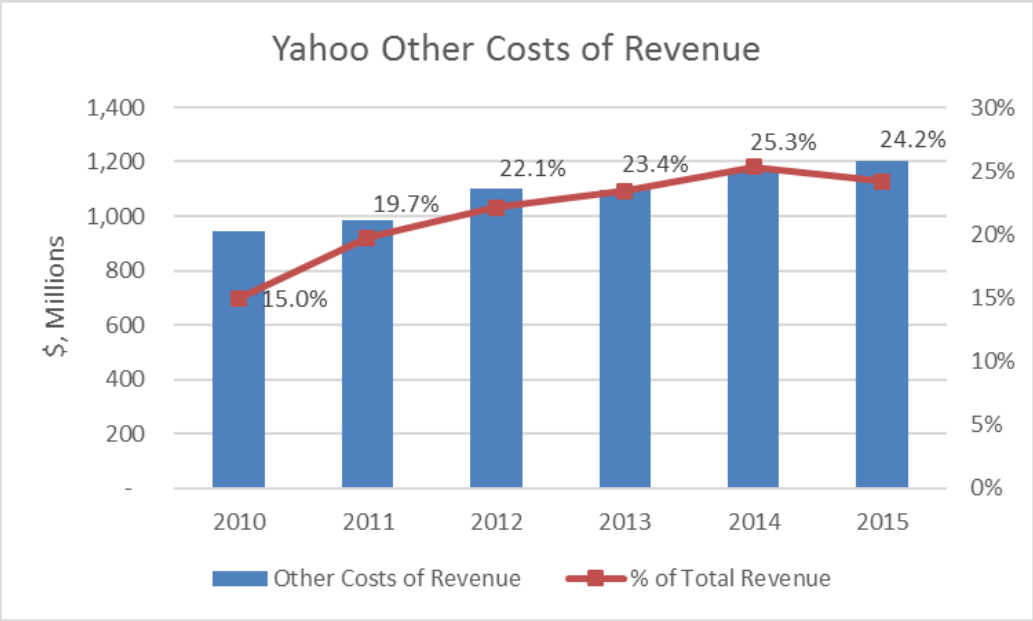

Figure 7

Figure 7 above highlights how other costs of revenue have remained relatively stable in Dollar amount, and reasonably stable as a proportion of total group revenue since 2012. We therefore estimate that this stability will continue in the future. We believe other cost of revenues will remain at approximately 21% throughout our projection period.

Sales & Marketing Expenses

Sales and marketing expenses for the year ended December 31, 2015 decreased $4 million, compared to 2014, primarily attributable to declines in compensation costs of $52 million and stock-based compensation expense of $4 million. These cost reductions were somewhat offset by an increase in marketing expense of $38 million. Reductions in compensation costs are largely due to the decrease in headcount of 17% year-on-year. The increase in marketing expense was due to costs associated with a partner deal entered into in 2015 and brand marketing campaigns in 2015 for which there were no similar campaigns in 2014. We believe that these marketing expenses will persist into the future. Yahoo will also continue to decrease the overall company headcount in their attempt to make their operating business as strong as possible, which should result in a reduction in sales and marketing expenses.

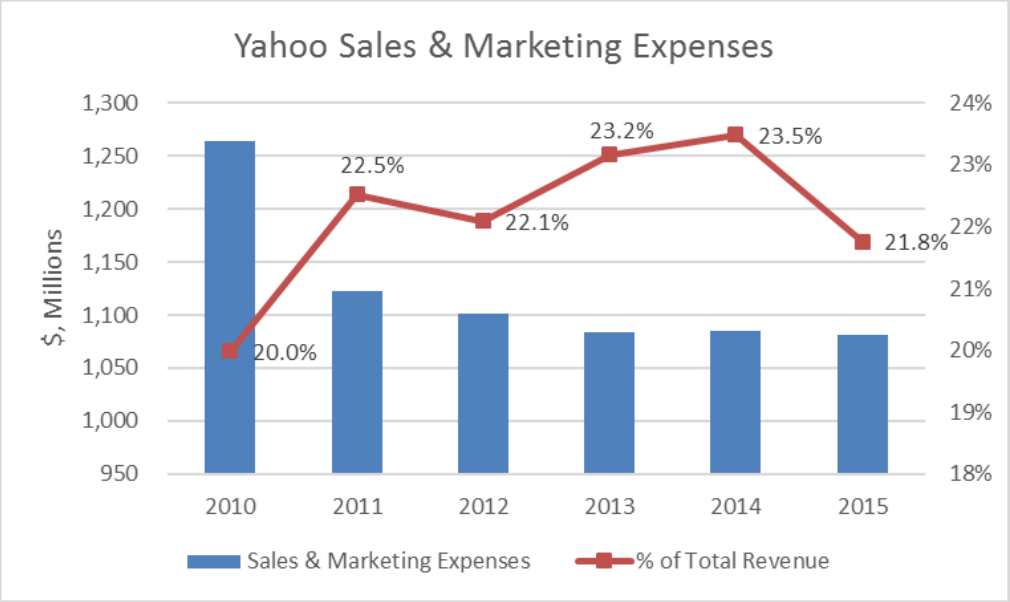

Figure 8

In Figure 8 we can see that sales and marketing expenses have remained reasonably steady in a Dollar amount since 2011, with a very slight downward trend. The average percentage of total revenue stands at 22.2%, which we factor downwards by 15% in line with managements stated aim to reduce headcount by 15%. This leaves us with selling and marketing as a percentage of total revenue of approximately 18.9% for our projection period.

Product Development

Product development expenses consist primarily of compensation-related expenses incurred for the development of, enhancements to and maintenance of Yahoo Properties, classification and organization of listings within Yahoo Properties, research and development, and Yahoo's technology platforms and infrastructure. Product development expenses for the year ended December 31, 2015 increased $18.5 million, or 3%, compared to 2014, primarily attributable to an increase of $51 million in stock-based compensation expense, as well as an increase in investment activities supporting search, communications and other product initiatives of $35 million. We believe that expenditure on product development will be vital in the company's attempt to capture a greater proportion of revenue through mobile devices, however any increases in product development spending may be offset by the targeted reduction in headcount. On average, product development expenditure has averaged at 8.7% of total revenue since 2012, and we see this proportion remaining constant over our projection period.

General & Administration Expenses

General and administrative expenses for the year ended December 31, 2015 increased $2 million compared to 2014, primarily attributable to increases of $26 million due to net gains on disposal of assets, business tax refunds received and legal settlements in 2014 for which there are no similar benefits in 2015. These increases in general and administrative expenses were partially offset by declines in facilities and equipment expense of $16 million, outside service provider expense of $16 million and compensation costs of $14 million. The decline in compensation costs was primarily attributable to a 19% decline in headcount year-over-year. We believe that general and administrative expenses will drop in the future as a proportion of total revenues reflecting Yahoo's further reducing headcount and capital expenditures.

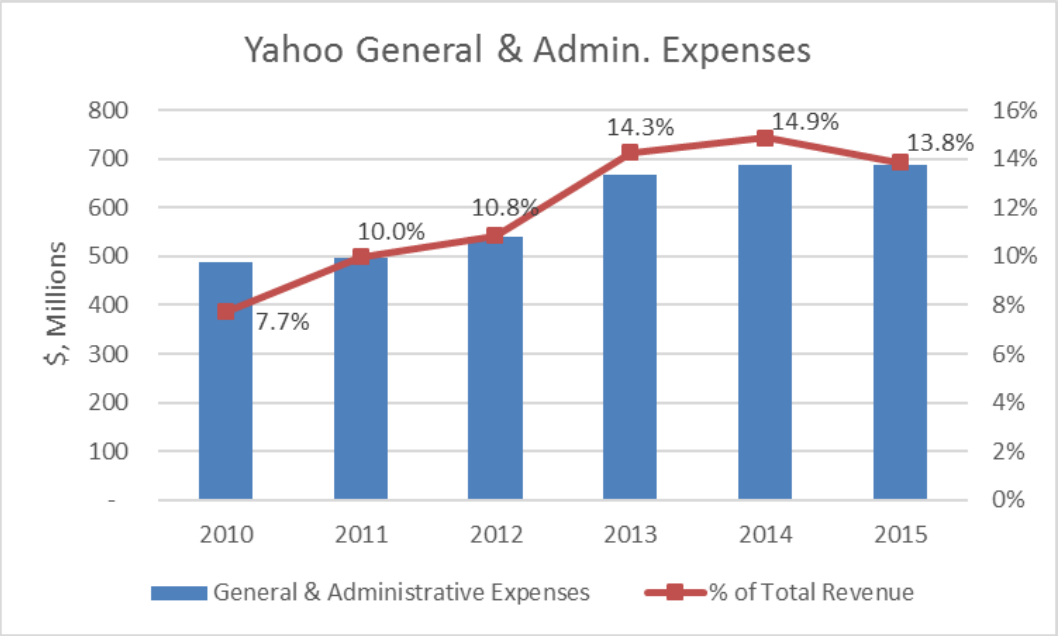

Figure 9

In Figure 9 we can see that in 2016 general and administrative expenses as a percentage of total group revenue stood at 13.8%. We adjust this proportion down by 15% in line with management's headcount reduction goal, giving us a value of approximately 11.7% for general and administrative expenses as a percentage of total revenue going forward.

Restructuring & Goodwill Impairment Charges

Yahoo have implemented various restructuring plans to reduce their cost structure, align resources with product strategy and improve efficiency. These have resulted in workforce reductions and the consolidation of certain real estate facilities and data centres. For the year ended December 31, 2015 Yahoo recorded expenses of $104 million, primarily related to severance, facility and other

related costs related to restructuring plans that Yahoo initiated in 2015. The $66 million restructuring liability as of December 31, 2015 consists of $15 million for employee severance expenses, which are expect to pay out by the end of the second quarter of 2017, and $51 million related to non-cancellable lease costs, which we expect to be paid through the fourth quarter of 2025, in-line with management's expectations. Yahoo announced in February 2016 that they intended to reduce company headcount by 15% by the end of 2016 and exit five offices. Yahoo estimates that it will incur a total of $64 million to $78 million in pre-tax charges in connection with the planned action (for estimation purposes we take a mid-value of $71 million, over two years).

In 2015, Yahoo recorded a $4,461 million goodwill impairment charge as a result of the sustained decrease in market capitalisation, lower estimated revenue projections and concerns over the short-term profitability of the company. We see this as a once-off event, unlikely to be repeated over our five-year projection period. In line with company expectations and recent trends, we outline our expected restructuring charges in Table 2 below:

$, Millions	2016	2017	2018	2019	2020
Employee Severance	7.5	7.5	-	-	-
Non-Cancellable Lease Costs	5.1	5.1	5.1	5.1	5.1
Office Exiting	35.5	35.5	-	-	-
Total R&G Impairment Charges	48.1	48.1	5.1	5.1	5.1

Table 2

Capital Expenditures

Capital expenditures (CapEx) are generally comprised of purchases of computer hardware, software, server equipment, furniture and fixtures. CapEx was $543 million in 2015, $396 million in 2014, and $338 million in 2013. Management expects 2016 CapEx to be to be approximately $450 million, reflective of management's emphasis on restructuring. From 2013 to 2015 CapEx grew at a CAGR of 17.1%. We predict that CapEx will increase again in the future to upgrade and develop Yahoo's functional capabilities, however in light of Yahoo's recent restructuring we believe Yahoo will be cautious regarding rapid future expansion. Therefore, we expect CapEx to rise at a lower rate than the historic average and predict growth to be 5% for FY 2017, and increase by 50 basis points thereafter.

Depreciation & Amortisation

Depreciation and amortisation has been very stable since 2012, at approximately 12.9% of total group revenue. However, this is likely to decrease in future, given management's cost-cutting plans. We take the 15% targeted reduction in headcount as a proxy for the decrease in depreciation and

amortisation expense as a proportion of revenue, giving us a value for our projection period of approximately 11% of total group revenue.

Other Forecasts

We assume the effective tax rate for Yahoo of 35% will continue throughout our forecast period.

We assume changes in working capital to be 5% of total group revenue, on average.

Valuation

We calculate Yahoo's two year rolling beta using monthly returns from April 2012 to April 2016 (graphed in Figure 10 below), and we assume that the Wilshere 5000 is an accurate proxy for the representative agent's market portfolio. We obtain a beta estimate 1.415. We assume the market risk premium to be 7% and the risk-free rate to be 1.84%, the ten-year Treasury Constant maturity rate as of April 28th 2016. We estimate Yahoo's average cost of debt to be 5.85%. Historically, Yahoo has been financed almost entirely financed through equity. As of the end of 2015 Yahoo has a debt to total assets ratio of 3%, this represents a one percentage increase from the previous financial year. Yahoo has not expressed any plans that would suggest an overhaul of their capital structure. We therefore feel confident in using WACC valuation methodology. We obtain a WACC value of 11.5%.

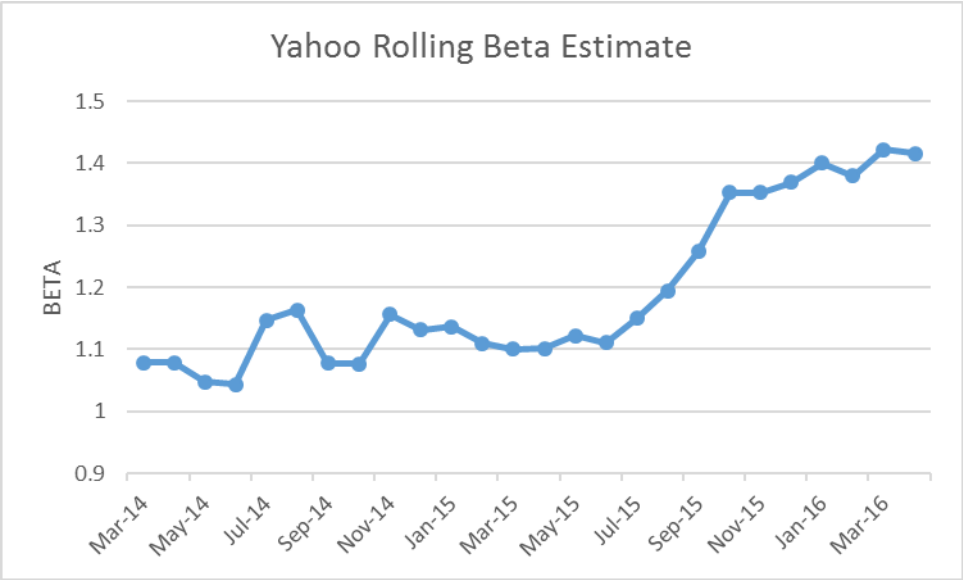

Figure 10

We have seen a rise in Yahoo's beta estimate over the previous two years, evident in Figure 10 above. We believe this to be a by-product of the restructuring that has been taking place, as Yahoo has been in the process of an operational transformation it has affected its sensitivity to market

wide movements. The almost linear increasing relationship leads us to believe that this trend is unlikely to be due to standard errors in the estimates. We are confident our estimates reflect a general increase in risk associated with holding Yahoo.

In order to value Yahoo shares we must also value the Yahoo stakes in both *Alibaba* and *Yahoo Japan*. We do this using the current market capitalisation of both companies, taking into account the stake that Yahoo holds in each. This analysis can be seen in Table 3 below.

Yahoo! Japan - YHOO owns 35.5%		**Alibaba - YHOO owns 15.5%**	
Yahoo Japan Market Cap (YAHOY, millions)	$ 24,860	Alibaba Market Cap (BABA, millions)	$ 190,496
YHOO Stake	35.5%	YHOO Stake	15.5%
YHOO Value in Yahoo Japan	$ 8,825	YHOO Value in Alibaba	$ 29,527
- Taxes (35%)	$ -3,089	- Taxes (35%)	$ -10,334
YHOO's After-Tax Value	$ 5,736	YHOO's After-Tax Value	$ 19,192
YHOO Shares Outstanding (million)	946.8	YHOO Shares Outstanding (million)	946.8
Value per YHOO Share	$ 6.06	**Value per YHOO Share**	$ 20.27

Table 3

Based on current market capitalisations, Yahoo's stakes in both *Yahoo Japan* and *Alibaba* are worth $6.06 and $20.27 respectively. We also know that Yahoo currently has a total cash & short-term investments value of $5,857 million, or approximately $6.19 per share. Based on the most recent closing price of YHOO stock ($36.60), this suggests that the market is currently valuing Yahoo's core business at $4.08. We calculate a value for Yahoo's core business through our DCF model, which can be seen in full in **Appendix I**, and add this to our Table 3 values per share of Yahoo's stakes in *Yahoo Japan* and *Alibaba* to obtain a target price for YHOO stock. The assumptions and calculations involved can be seen in Tables 4 and 5 below.

One of our most vital assumptions is our choice of long-term growth rate. Yahoo has experienced several years of declining revenue and market share; a trend which management must reverse if the company is to survive long-term. While a sale of the core business is likely, we must not underestimate the possibility of this not occurring and Yahoo continuing under its current operational structure. While only time will tell how effective the proposed cost-cutting measures have been, the emphasis that management have placed on business streamlining is certainly a welcome one for investors.

To determine our growth rate, we first focus on the US economy - the key geographic region for Yahoo's operations. The US economy has shown solid growth in recent years, and looking forward we believe that US GDP growth will trend at about 2% through 2020, based on the average quarterly GDP growth rate of 2.3% observed since the start of 2013. Therefore, our growth rate should be capped at an absolute maximum of 2%, based on the GDP forecasts of the primary economy in

which they operate and the unlikeliness of management turning around the fortunes of the company to the extent that they grow at a faster rate than the US economy. On a company-level, returning to growth is a must for Yahoo. Further declines beyond our forecast period could terminally damage the company. Restructuring could take several years to be implemented fully, but we believe that long-term annual growth of approximately 0.5% is very achievable for a company with the reach of Yahoo: reaching three quarters of the US online population each month, despite their declining market share of US online advertising. Renewed focus on core operations, business streamlining and generating revenue through mobile devices (an area in which Yahoo has been lagging behind, and has not yet realised its true potential) should return the company to moderate growth. A top executive recently commented that missed revenue targets last year were due to excessive focus placed on expanding the user base, rather than actually selling advertising. Realigning company focus back towards advertising should correct this, given their already wide user base. For these reasons we believe a 0.5% long-term growth rate is an appropriate estimate.

Assumptions		
Long Term Growth Rate		0.50%
Shares Outstanding (Million)		946.8
Current YHOO Price (April 29th 2016)	$	36.60
YAHOY Value per Share	$	6.06
BABA Value per Share	$	20.27

Enterprise Value (Millions) - Core Business		
Normalised FCF, 2020	$	190.4
Normalised FCF, t+1	$	191.3
Long Term Growth Rate		0.50%
Terminal Value	$	1,739.1
PV of Terminal Value	$	1,009.1
PV of FCF	$	1,807.1
Enterprise Value	$	2,816.2

Perpituity Growth Method (Millions)		
Enterprise Value	$	2,816.2
Less: Net Debt	$	(1,233.5)
Add: Cash & Equivalents	$	5,857.0
Equity Value	$	7,439.7
Shares Outstanding (Million)	$	946.8
Core Business Value per Share	**$**	**7.86**

Table 4

YAHOY Value per YHOO Share	$	6.06	YAHOY Value per YHOO Share	$	6.06
BABA Value per YHOO Share	$	20.27	BABA Value per YHOO Share	$	20.27
Cash & Equivalents per Share	$	6.19	Cash & Equivalents per Share	$	6.19
Market Core YHOO Business Value	$	4.08	DCF Core YHOO Business Value	$	7.86
Current YHOO Market Price	$	36.60	YHOO Target Price	$	40.38
			Market Premium		*10.32%*

Table 5 – Market vs. DCF Comparison

We can see from Tables 4 and 5 that our DCF valuation of Yahoo's core business results in a target price of $40.38, an approximate 10.3% upside on the current market price. However, alongside this valuation we must also analyse the ongoing auction for Yahoo's core business.

On April 18th Yahoo received the first round of bids for the sale of its core business. Management has recently stated that the sale of the core business is a top priority, and so we believe that a sale is imminent. An analysis of the media coverage indicates that the clear frontrunner in this auction is Verizon Communications Inc., a US broadband and telecommunications company. In May 2015 Verizon purchased AOL, a US global mass media and web search provider in a deal worth approximately $4.4 billion. Verizon is attempting to take a larger share of the digital advertising market by combining the Yahoo core business with AOL. The size of Verizon's bid for Yahoo is still unknown, but analysts estimate it may be in the region of $7-$8 billion. For our estimation purposes, we will assume a value of $8 billion for Verizon's bid. All media analysis suggests that Verizon is the heavy favourite to complete this bid, and the likelihood of this increased on April 27th when management agreed to add four new directors to the board who are explicitly aiming for a quick sale of the core business. For these reasons we will not analyse any further bids other than Verizon's. Assuming a bid of $8 billion for the core business, the resulting shareholder value breakdown can be seen in Table 6 below.

Bid Value (Million)	$	8,000
Shares Outstanding (Million)		946.8
Bid Value per Share	$	8.45
Market Core YHOO Business Value	$	4.08
Bid Premium	$	4.37

Table 6

Based on our analysis of the auction process and the views of various commentators throughout the media, a successful Verizon bid appears increasingly likely. In the event of a successful Verizon bid, Yahoo would become a shell company holding the two stakes in *Yahoo Japan* and *Alibaba*, plus cash and equivalents. Therefore, we calculate the estimated value to shareholders for both of our two scenarios (that the business will continue under the status-quo, and that Verizon will complete a successful bid), assign an approximate probability to the likelihood of each scenario occurring and calculate an estimate of the potential upside to shareholders based on the current YHOO closing price. A breakdown of this can be seen in Table 7 below.

Scenario 1: No Sale, DCF Analysis		Scenario 2: Successful Verizon Bid	
YAHOY Value per YHOO Share	$ 6.06	YAHOY Value per YHOO Share	$ 6.06
BABA Value per YHOO Share	$ 20.27	BABA Value per YHOO Share	$ 20.27
Cash & Equivalents per Share	$ 6.19	Cash & Equivalents per Share	$ 6.19
DCF Core YHOO Business Value	$ 7.86	Resulting YHOO Share Value	$ 32.52
YHOO Target Price	**$ 40.38**	Cash From Core Business Sale	$ 8.45
Scenario Probability	*10%*	**Cumulative Value to Shareholders**	**$ 40.97**
		Scenario Probability	*90%*
Scenario 1 Probability-Adjusted Value			$ 4.04
Scenario 2 Probability-Adjusted Value			$ 36.87
Target Sareholder Value			$ 40.91
Potential Upside			*11.78%*

Table 7

Our probability weighted value to shareholders of $40.91 represents an 11.78% upside on the current share price. The overwhelming likelihood of a successful bid means this potential upside is not particularly sensitive to any changes in WACC or long-term growth rate.

Overall, we believe that the sale of the core business is in the best interests of shareholders. Yahoo's recent struggles have shown no signs of abating, and so we believe now is the time to capitalise on the premium associated with Verizon's bid. All indicators point to an imminent sale of the core business in the immediate future, and so we assign a **BUY** rating to Yahoo stock.

Appendix I

DCF Model: Yahoo Inc.

($, in Millions)

	Historical Period				Projection Period				
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Search & Display Advertising	4,028.7	3,691.6	3,660.9	4,158.3	3,656.5	3,508.8	3,334.6	3,160.3	2,986.0
% YoY		*(8.4%)*	*(0.8%)*	*13.6%*	*(12.1%)*	*(4.0%)*	*(5.0%)*	*(5.2%)*	*(5.5%)*
Other Reveue	957.9	988.8	957.2	810.0	874.5	839.2	797.5	755.8	714.1
% YoY		*3.2%*	*(3.2%)*	*(15.4%)*	*8.0%*	*(4.0%)*	*(5.0%)*	*(5.2%)*	*(5.5%)*
Total Revenue	**$ 4,986.6**	**$ 4,680.4**	**$ 4,618.1**	**$ 4,968.3**	**$ 4,531.0**	**$ 4,348.0**	**$ 4,132.0**	**$ 3,916.1**	**$ 3,700.1**
% YoY		*(6.1%)*	*(1.3%)*	*7.6%*	*(8.8%)*	*(4.0%)*	*(5.0%)*	*(5.2%)*	*(5.5%)*
TAC	518.9	254.4	217.5	877.5	731.3	701.8	666.9	632.1	597.2
% YoY		*(51.0%)*	*(14.5%)*	*303.4%*	*(16.7%)*	*(4.0%)*	*(5.0%)*	*(5.2%)*	*(5.5%)*
Other Cost of Revenue	1,101.7	1,094.9	1,169.8	1,200.2	951.5	913.1	867.7	822.4	777.0
% YoY		*(0.6%)*	*6.8%*	*2.6%*	*(20.7%)*	*(4.0%)*	*(5.0%)*	*(5.2%)*	*(5.5%)*
Gross Profit	**$ 3,366.0**	**$ 3,331.0**	**$ 3,230.8**	**$ 2,890.6**	**$ 2,848.2**	**$ 2,733.1**	**$ 2,597.4**	**$ 2,461.6**	**$ 2,325.9**
% margin	*67.5%*	*71.2%*	*70.0%*	*58.2%*	*62.9%*	*62.9%*	*62.9%*	*62.9%*	*62.9%*
Product Development	236.6	328.8	549.8	568.3	394.2	378.3	359.5	340.7	321.9
Sales & Marketing	1,101.6	1,083.9	1,084.4	1,080.7	856.4	821.8	781.0	740.1	699.3
General & Administrative	540.2	667.4	686.3	687.8	530.1	508.7	483.4	458.2	432.9
Restructuring & Goodwill Charges	236.2	67.3	191.9	4,609.2	48.1	48.1	5.1	5.1	5.1
Total Operating Costs	2,114.5	2,147.4	2,512.4	6,946.1	1,828.8	1,756.9	1,629.0	1,544.1	1,459.2
% YoY		*1.6%*	*17.0%*	*176.5%*	*(73.7%)*	*(3.9%)*	*(7.3%)*	*(5.2%)*	*(5.5%)*
EBITDA	**$ 1,251.5**	**$ 1,183.6**	**$ 718.4**	**$ (4,055.5)**	**$ 1,019.4**	**$ 976.3**	**$ 968.4**	**$ 917.5**	**$ 866.6**
% margin	*25.1%*	*25.3%*	*15.6%*	*(81.6%)*	*22.5%*	*22.5%*	*23.4%*	*23.4%*	*23.4%*
Depreciation & Amortization	649.3	629.0	606.6	609.6	498.4	478.3	454.5	430.8	407.0
EBIT	**$ 602.2**	**$ 554.6**	**$ 111.8**	**$ (4,665.1)**	**$ 521.0**	**$ 498.0**	**$ 513.9**	**$ 486.8**	**$ 459.6**
% margin	*12.1%*	*11.8%*	*2.4%*	*(93.9%)*	*11.5%*	*11.5%*	*12.4%*	*12.4%*	*12.4%*
Taxes	1,940.0	153.4	3,679.3	(1,688.5)	182.3	174.3	179.9	170.4	160.9
EBIAT	**$ (1,337.8)**	**$ 401.2**	**$ (3,567.5)**	**$ (2,976.6)**	**$ 338.6**	**$ 323.7**	**$ 334.0**	**$ 316.4**	**$ 298.8**
Plus: Depreciation & Amortization					498.4	478.3	454.5	430.8	407.0
Less: CapEx					(450.0)	(472.5)	(498.5)	(528.4)	(562.7)
Less: Increase in Net Working Capital					226.6	217.4	206.6	195.8	185.0
Unlevered Free Cash Flow					**$ 613.6**	**$ 546.9**	**$ 496.7**	**$ 414.6**	**$ 328.0**
WACC	11.5%								
Discount Period					1.0	2.0	3.0	4.0	5.0
Discount Factor					0.90	0.80	0.72	0.65	0.58
Present Value of Free Cash Flow					**$ 550.3**	**$ 439.9**	**$ 358.3**	**$ 268.2**	**$ 190.4**
Cumulative PV of FCF	**$ 1,807.1**								

Appendix II

Our quarterly revenue forecasts using a seasonal adjustment and exponential smoothing model were calculated as follows.

- Start with quarterly revenue values from Q4 2006 through to Q1 2016, denominated in millions. We first calculate a centered moving average, to extract the seasonal component of the time series. As we are forecasting with quarterly data, a 4-period moving average should be free of seasonality as it includes one observation for each quarter of the year. Our first centered moving average value is calculated via Equation 1, and so on.

$$X_1^* = \frac{\frac{X_1 + X_2 + X_3 + X_4}{4} + \frac{X_2 + X_3 + X_4 + X_5}{4}}{2}$$

Equation 1

- We then calculate the *ratio-to-moving average*, as the original data divided by the moving average in each period. This is also known as the *trend-cycle* component of the pattern.
- Next, the estimated *seasonal index* for each quarter is computed by first averaging all the *ratio-to-moving average* for that particular quarter across all years. These average ratios are then rescaled so that they sum to exactly 100% times the number of periods in a season, or 400% in this case, as we are working with quarterly data.
- Following this, the appropriate *seasonal index* value is assigned to each row of the time-series data table, according to the quarter of the year it represents.
- We now apply a linear exponential smoothing model to our seasonally adjusted data. The linear exponential smoothing (LES) model is initialized by setting the first two forecasts equal to the first actual value of the seasonally adjusted series. The forecasts are then generated via Equation 2, the single equation recursive form of Brown's model.

$$\hat{Y}_t = 2Y_{t-1} - Y_{t-2} - 2(1-\alpha)\epsilon_{t-1} + ((1-\alpha)^2)\epsilon_{t-2}$$

Equation 2

- In Equation 2, $\hat{Y}_t$ represents our revenue forecast for time *t* (as a function of previous observed revenue values Y_t), α represents the chosen smoothing constant, and ϵ_t represents the error value at time *t.*
- Error terms are calculated by subtracting model forecasts from the actual observed values over our historic period. We used a linear equation solver within Excel to calculate an optimal α value (smoothing parameter, between 0 and 1) to minimise the Root Mean Squared Error (RMSE) term of the model, which is the square root of the variance of the

errors plus the square of the mean. In calculating the mean and variance of the errors in this formula, the first two periods are excluded because the model does not actually begin forecasting until the third period of our time series data.

- We then "re-seasonalise" each forecast, by multiplying our LSE forecast value by the appropriate seasonal index value, according to what quarter of the year the forecast relates to.
- The model is then "bootstrapped" into the future to create forward-looking forecasts by substituting forecasts for actual revenue values at the point where the actual data runs out, i.e. Q2 2016 and beyond. We must note that the errors for future forecasts are all computed to be zero. This does not mean that the actual forecast errors will in truth be zero, rather it reflects the fact that for the purposes of prediction we assume that future data will equal our model forecasts on average.
- Our linear equation solver gave us an optimal α value for minimising the Root Mean Squared Error of $\alpha = 0.6681302$ (associated RMSE value = 73.140225). However, this smoothing parameter resulted in revenue forecasts which tended to zero too quickly to be considered realistic. Therefore, we took a calculated decision to set our smoothing parameter $\alpha = 0.4$. This parameter resulted in far more realistic quarterly revenue forecasts (as seen in Figure 4 of the report), without incurring any meaningful increase in the Root Mean Squared Error value (associated RMSE = 79.310716). This observed increase in the RMSE value is negligible for the purposes of revenue forecasts.
- Quarterly revenue data and spreadsheet calculations are available upon request, from Harry.Barrett@ucdconnect.ie.

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