

**DISCOUNTED CASH FLOW VALUATION OF
FACEBOOK INC.**



**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF MANAGEMENT
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DISCOUNTED CASH FLOW VALUATION OF FACEBOOK INC.

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ABSTRACT

This thematic paper demonstrated how to value the stock price specifically Facebook INC. (FB) in which the framework of discounted cash flow to firm (DCFF) are applied. The process starts with creating a forecast, calculating a reasonable valuation and recommending to buy/hold/sell the company stock.

FB is to give people the power to share and make the world more open and connected. Also, FB builds useful and engaging products that enable people to connect and share through mobile devices, personal computers, and other surfaces. FB is unique in term of its peer's valuation as there are unique and kind of helping people to connect around the world. Thus, FB is valued in comparison with other peers such as Google (GOOG) and Twitter (TWTR) which are quite similar in business model and industry.

The result from this paper illustrates the fair value of FB share price which is expected to be valued higher than the current share price as of DEC 2017 by 44%. The result obtained has the recommendation of "BUY" as the current share price is still undervalued.

KEY WORDS: FB / Discount Cash Flow/ Firm Valuation

50 pages

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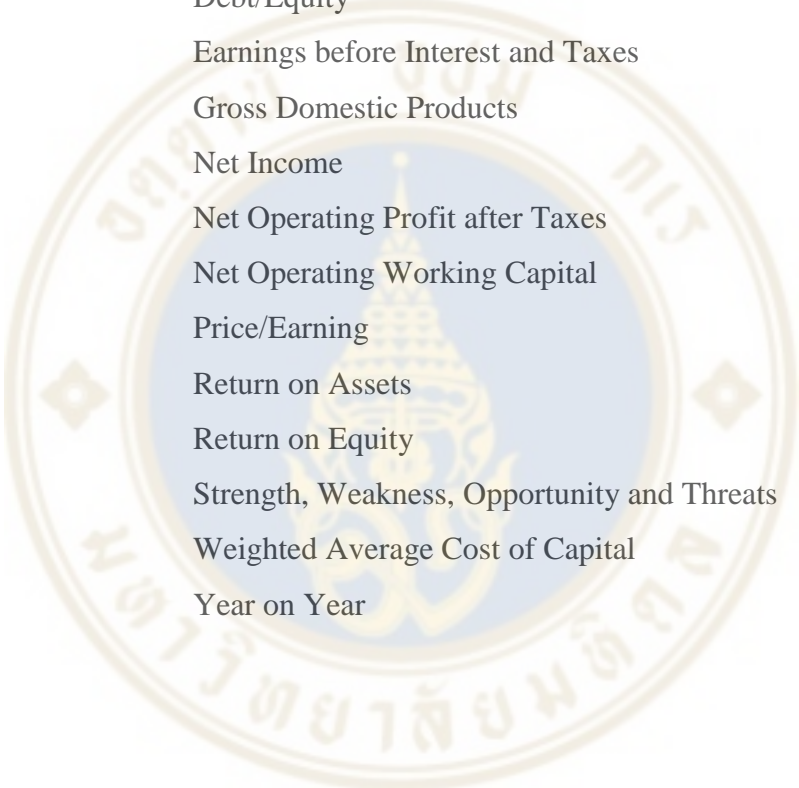
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LIST OF ABBREVIATIONS



BV	Book value
CAGR	Compound Annual Growth Rate
D/E	Debt/Equity
EBIT	Earnings before Interest and Taxes
GDP	Gross Domestic Products
N/I	Net Income
NOPAT	Net Operating Profit after Taxes
NOWC	Net Operating Working Capital
P/E	Price/Earning
ROA	Return on Assets
ROE	Return on Equity
SWOT	Strength, Weakness, Opportunity and Threats
WACC	Weighted Average Cost of Capital
YoY	Year on Year

CHAPTER I VALUATIONS

1.1 Highlights

Date: 8th Dec 2017

Ticker: NASDAQ: FB

Recommendation: BUY

Price: USD 179.00

Target Price: USD 256.91

Upside: 44%

<i>Earnings/Share</i>						
	Mar.	Jun.	Sept.	Dec.	Year	P/E Ratio
2014	\$0.34	\$0.42	\$0.43	\$0.54	\$1.73	73.0
2015	\$0.42	\$0.50	\$0.57	\$0.79	\$2.28	105.3
2016	\$0.77	\$0.97	\$1.09	\$1.41	\$4.24	44.4
2017F	\$1.04	\$1.32	\$1.59	\$1.91(F)	\$5.86(F)	30.6

Figure 1.1: Facebook's Stock Performance

- Fundamental and valuation are indicative of Buy:** With the target price at 256.91 USD at the end of 2017, there is a 44% upside from current price. However, we believe that Facebook will be able to easily achieve or even compete the assumed growth rate of 30% during the high growth period as we can obviously observe the trend of media are shifting towards digitization and we believe this is only the beginning. The improvement in Facebook algorithm, Artificial Intelligence (AI) in particular, will improve advertisers' ability to target the most relevant consumers in a way that cannot be matched by humans so that advertisers would consistently get the highest return on investment which is far higher than ROI from any other types of media. With these reasons provided, the migration of advertisers from traditional media to social media will be even more accelerated which will propel the growth of Facebook.

We believe that investing in Facebook equity could be one of the best long term investment opportunity in one's lifetime.

- Hyper growth stock with monopoly position:** Facebook is apparently the winner in the social media market given its strongest and highest users base (2.07 billion monthly active users as of Q3 2017) which is 65% of worlds' population that have access to the internet. Given the strongest network effect, switching cost for users to shift to other platforms are considerably high. This is why Facebook can maintain the monopoly position in the social media market. Together with family of applications that Facebook have acquired, it can then easily shift over the existing users base. Instagram is obviously a good example.

- Strong business model with rigid roadmap of long term growth:** Mark Zuckerberg (CEO of Facebook inc.) gave a very clear speech during the F8 conference in 2016 on the direction and 10 years roadmap of the company. For 3 years term, Facebook application will be the major growth driver for the company. While family of products namely Instagram, messenger, whatsapp, video and search will drive the growth for the next 5 years. And ultimately, VR/AR, AI and connectivity will be major drivers in the next 10 years. We believe that Facebook still have other several growth engines that are still not yet monetized.



Market Data	
Market Capitalization	520.14 B
Average Daily Volume	15.9 M
52 Week Price Range	USD 114.77 - 184.25
Major Institutional Holdings	
- Vanguard Group Inc	5.60%
- Fidelity Management and Research Company	4.48%
Shares Outstanding	2950 M
Book value per share	USD 20.1
Dividend per share	-
Earning per share	USD 5.16

Figure 1.2: Market Data as of 8th DEC 2017

1.2 Financial Summary

Table 1.1: FB Key financial indicators

Key Financial Ratio	2012A	2013A	2014A	2015A	2016A	2017F	2018F	2019F	2020F
Current Ratio (x)	10.71	11.88	9.60	11.25	11.97	26.84	27.22	27.16	26.50
Total Asset Turnover (x)	0.47	0.48	0.43	0.40	0.48	0.61	0.70	0.76	0.82
Gross Profit Margin (%)	73.20%	76.18%	82.73%	84.01%	86.29%	80.00%	80.00%	80.00%	80.00%
EBIT Margin (%)	10.57%	35.62%	40.06%	34.72%	44.96%	27.82%	28.79%	29.53%	30.10%
Net Profit Margin (%)	1.04%	19.05%	23.58%	20.57%	36.97%	18.23%	22.93%	23.53%	24.00%
ROA (%)	13.80%	47.14%	27.85%	20.74%	37.69%	30.34%	34.70%	38.25%	40.47%
ROE (%)	0.45%	9.70%	8.14%	8.34%	17.26%	11.32%	15.62%	17.25%	18.61%
Debt Ratio (%)	9.93%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%	0.00%	0.00%

1.3 Business Description

Facebook website was launched on February, 2004 by Mark Zuckerberg, along with fellow Harvard College students and roommates, Eduardo Saverin, Andrew McCollum, Dustin Moskovitz, and Chris Hughes. Facebook's mission is to give people the power to share and make the world more open and connected. The company's top priority is to build useful and engaging products that enable people to connect and share through mobile devices, personal computers, and other surfaces. Facebook also help people discover and learn about what is going on in the world around them, enable people to share their opinions, ideas, photos and videos, and other activities with audiences ranging from their closest friends to the public at large, and stay connected everywhere. The summary below shows the timeline how Facebook inc. have been developed since 2004 until present.

Month / Year	Description
February, 2004	Mark Zuckerberg and co-founders Dustin Moskovitz, Chris Hughes and Eduardo Saverin launch Facebook.
April, 2006	Facebook for mobile devices launch. Facebook on mobile made it possible to communicate with Facebook by text messages, and later it became possible to upload photos as well as visiting Facebook's site from your mobile phone
July, 2008	Facebook for iPhone launches
April, 2012	Facebook announce acquisition of instagram

May, 2012	Facebook holds its initial public offering
February, 2013	Facebook announces the acquisition of Atlas (Atlas is an Advertiser Suite which was acquired from Microsoft)
February, 2014	Facebook announces acquisition of Whatapps
March, 2014	Facebook announces acquisition of Oculus
July, 2016	Aquila's first flight announced

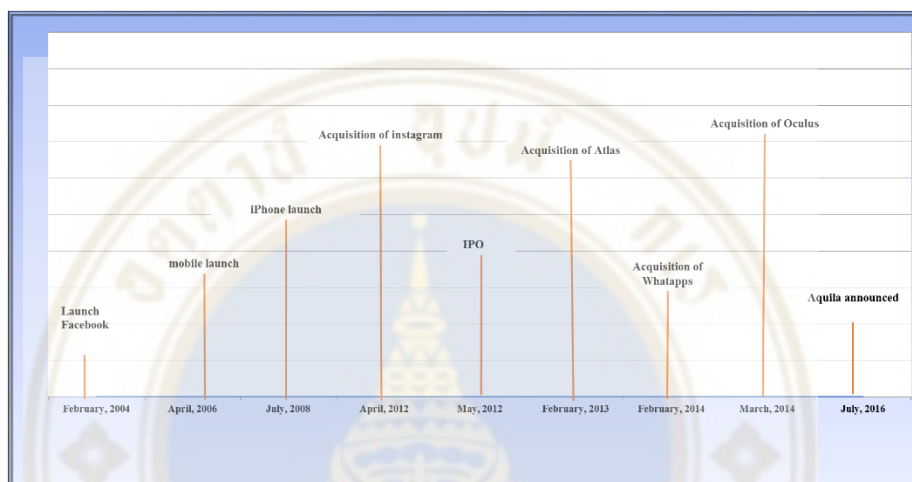


Figure 1.3: Facebook development timeline

1.3.1 Facebook's main products

1.3.1.1 Facebook: The main source of revenue derived from News feed where advertisers pay Facebook to display their ads that are relevant to each users' personal interest. This is being done through the algorithm that capturing the behaviors and interests of each users such as personalities, places visited, food preference, sports, travels, families, close friends through Likes, comment, page view, and all other activities that users perform on the platform. Facebook even keeps records where users are if location services is set to always enabled.

1.3.1.2 Instagram: What differentiate Instagram from Facebook is that it enables people to take photos or videos, customize them with filter effects, and share them with friends and followers in a photo feed or send them directly to friends. Instagram is a perfect complimentary to fill the gap of users' need that Facebook could not provide.

1.3.1.3 Facebook Messenger: Messenger allows for a rich and expressive way to communicate with people and businesses alike across a variety of platforms and devices, which makes it easy to reach almost everyone seamlessly and securely.

1.3.1.4 WhatsApp: WhatsApp Messenger is a fast, simple and reliable messaging application that is used by people around the world and is available on a variety of mobile platforms.

1.3.1.5 Oculus: Oculus virtual reality technology and content platform power products that allow people to enter a completely immersive and interactive environment to play games, consume content, and connect with others.

Facebook's source of revenue is mainly from selling advertising placements to marketers. Facebook's ads let marketers reach people based on a variety of factors including age, gender, location, interests, and behaviors. Marketers purchase ads that can appear in multiple places including on Facebook, Instagram, and third-party applications and websites.

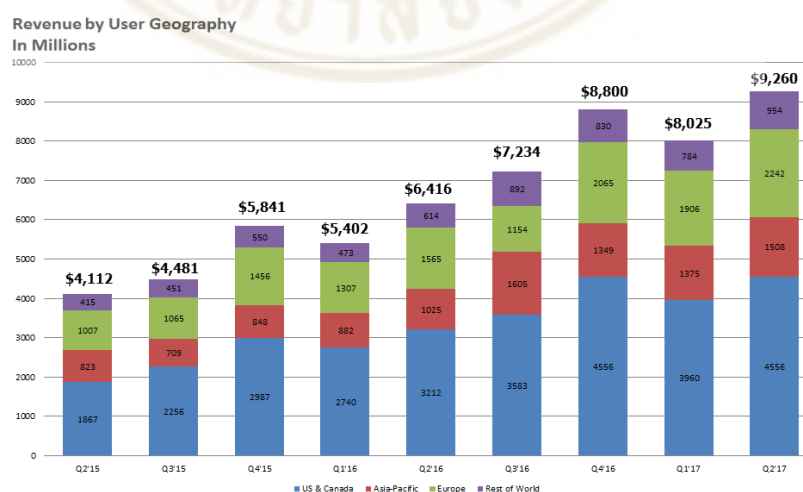


Figure 1.4: Revenue by User Geography

The no. 1 source of revenue is from US & Canada, while no. 2 is from Europe, no. 3 is from Asia-Pacific. All of these revenues are derived from Facebook as the main product. However, Instagram has started to gradually contribute more to the company's revenue. The exact amount was not disclosed publicly by Facebook. But analysts estimate that Instagram contribute around 10+% of overall Facebook's revenue. And it will tend to increase in the future when the company accelerate the monetization plan.

In addition, Facebook is also investing in a number of longer-term initiatives, such as connectivity efforts and artificial intelligence research, to develop technologies that the company believe will help better serve communities and pursue company's mission to make the world more open and connected.

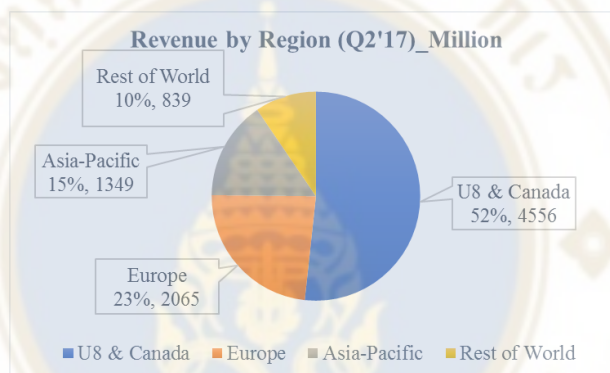


Figure 1.5: Revenue by Region in Q2'17

In addition, the largest proportion of revenue in Q2, 2017, it belongs to US & Canada. While no.2 revenue is from Europe and no.3 is from Asia-Pacific. There is a room for the substantial growth in revenue in the future and it is in line to continue increasing year on year.

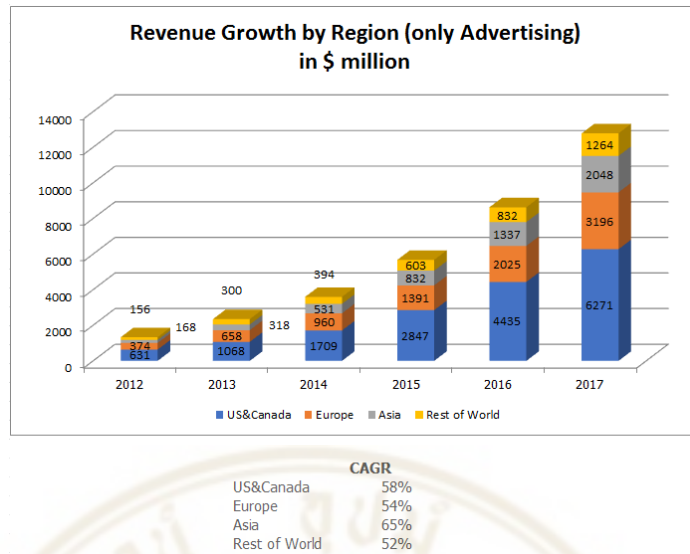


Figure 1.6: Revenue growth by region (only Advertising) in \$million

Seeing from the table above, it shows that the average revenue growth from global is around 52% - 65% which is based on US&Canada is 58%, Europe is 54%, Asia is 65% and Rest of world is 52% (This is an information from Facebook’s annual report). It is gradually increasing year-on-year which create a substantial growth to reach the people around the world that are unable to connect and access to internet (around 50% of people around the world that can not access to internet).

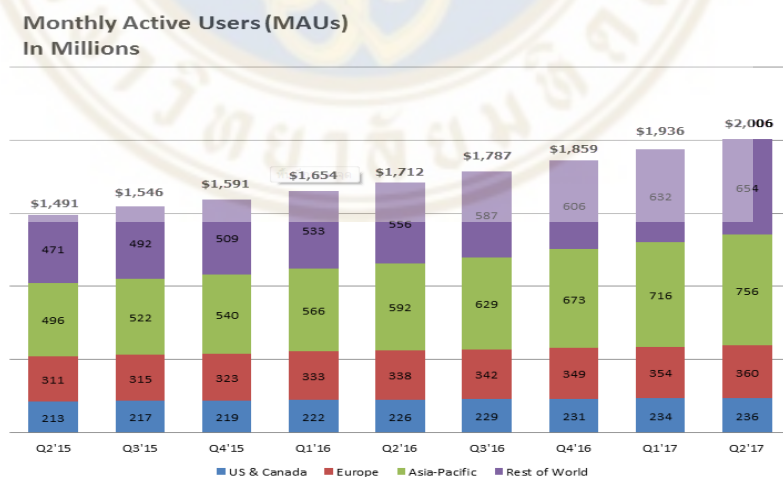


Figure 1.7: Monthly Active Users (MAUs)

Across the globe, US & Canada has lowest monthly active users while Asia-Pacific is the highest. However, when looking at Average revenue per users (ARPU), it

is rather opposite that ARPU as of Q2,2017 of Asia-Pacific is only \$2.13 Vs. \$19.38 for US & Canada (see figure 6). This indicates substantial growth potential in Asia-Pacific region and the rest of the world where Facebook has not seriously monetized their products yet. Couple with an increasing trend of monthly active users growth quarter after quarter, Facebook is positioned to capture the opportunity of increasing trend of global internet penetration. Note that approximately 3.5 billion people which is half of the world population have access to the internet. We still can see tremendous opportunities to be captured.



Figure 1.8: Average Revenue per users

As seeing from the picture below, main revenue of Facebook is belonging to Mobile Advertising which is \$8.92 billion and no.2 is from Desktop Advertising which is only \$1.22 billion. And the rest is from Payments which is \$0.19 billion.

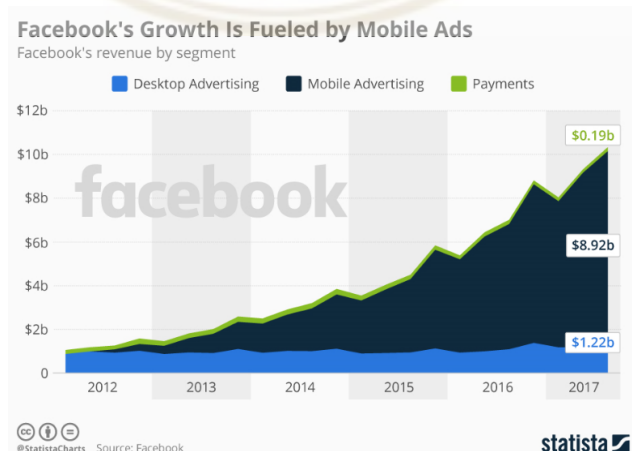


Figure 1.9: Facebook's revenue by segment

(Source: <http://www.gummicube.com/blog/2016/01/facebook-mobile-advertising/>)

1.4 Macro-Economic Analysis

Macro-economic Analysis: All factors suggest that there is positive prospect of Digital Media Growth.

1.4.1 Global internet usage, there is almost half of total population in the world are active internet users and almost all of them are mobile internet users. Presently, for the global internet use and penetration, total number of active internet users are around 3.773 billion which can be counted as 50% of the total population. And the total number of active mobile internet users are 3.448 billion which is 46% of the total population. It is expected that the number of global internet users will continue to increase year-on-year.

1.4.2 Time spent on the internet: People in 9 countries that we select (which are Philippine's, Brazil, Thailand, Indonesia, Malaysia, Mexico, Argentina, South Africa and India) spend an average of more than **eight hours per day** using the internet, and it's interesting to note that all of those countries appear to be at the lower end of the associated economic rankings. This implies a potential business that internet can generate in the future.

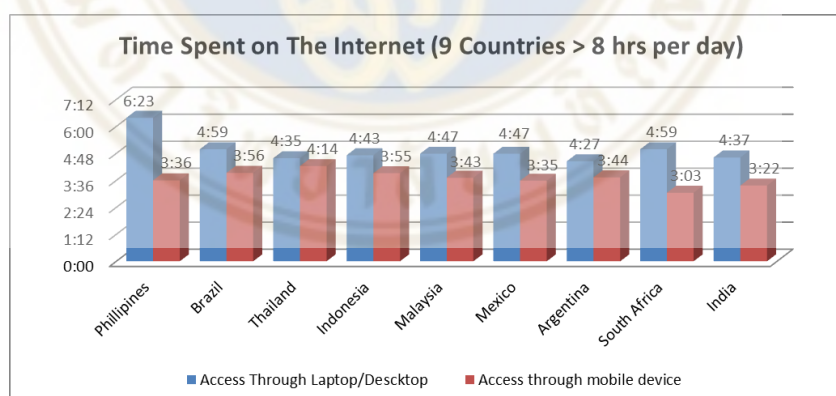


Figure 1.10: Time spent on internet

(Source: <https://wearesocial.com/special-reports/digital-in-2017-global-overview>)

1.4.3 Comparing Internet vs TV ad spend from 1995 to 2017E, we found that there is a sharp increase in the global internet ad spend against global TV ad spend. The magnitude of this can't be overstated; the first television ad aired in

1941, and the first internet ad was placed in 1994. It took the internet only 24 years to disrupt and outpace the 76-year-old TV advertising industry.

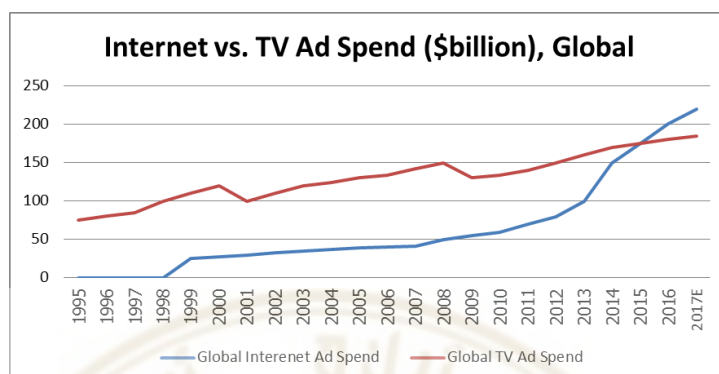


Figure 1.11: Internet vs. TV Ad spending

(Source: <https://wearesocial.com/special-reports/digital-in-2017-global-overview>)

From the chart below, the largest portion of online advertising revenue is from US in the amount of \$58,133 million. It is an opportunity of other countries which can take the portion of USA's revenue and become a major and lead of online advertising revenue in the future.



Figure 1.12: Online advertising revenues by main countries in 2017 (US\$ million)

1.4.4 According to mobile users (no internet connection) VS mobile connections (have internet connection to the public), almost two in three of the world's population now uses a mobile phone, with the total number of unique global mobile users rapidly approaching 5 billion. Wondering that even having

almost 5 billion of total population using mobile alone, there are almost 8.05 billion can access to the internet with mobile (more than 1 mobile for 1 user).

Mobile Users vs. Mobile Connections	
Total number of mobile users (Unique individuals)	4.92 billion
Mobile Penetration (Unique Users vs Total Population)	66%
Total number of mobile connections	8.05 billion
Average number of mobile subscriptions per unique user	1.64

Figure 1.13: Mobile Users vs. Mobile Connections

(Source: <https://wearesocial.com/special-reports/digital-in-2017-global-overview>)

The popularity of mobile messengers has surged in recent years [mobile connections], to the extent that these platforms are now the most popular forms of social media in many countries around the world. Instant messaging services present some amazing opportunities for brands, but it's important that they work quite differently to most other media.

Buyers today are researching brands and gathering information within mobile social apps. Traditional websites are becoming less relevant as social networks become "walled gardens", encouraging users to stay within the app for all online activities, purchases and engagement.

The share of mobile phone website traffic worldwide. In 2017, 50.3 percent of all website traffic worldwide was generated through mobile phones, up from 7.7 percent in the previous year. Mobile currently accounts for half of all global web pages served. Due to the strong growth of the smartphone market in recent years, this is no surprise, especially as mobile internet often provides a more viable online connection in regions that lack the infrastructure and money for traditional and more expensive landline connections.

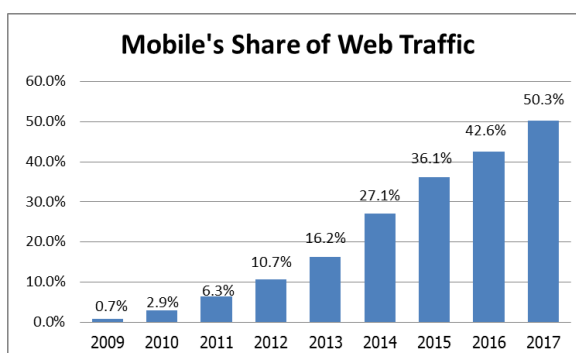


Figure 1.14: Mobile's share of web traffic

(Source: <https://wearesocial.com/special-reports/digital-in-2017-global-overview>)

1.4.5 Based on the expectation in using mainly on mobile and laptop in accessing to the internet, we found that people are encouraged to access the internet by using mobile and tablet higher than traditional device such as laptop. (57% and 43%, respectively).

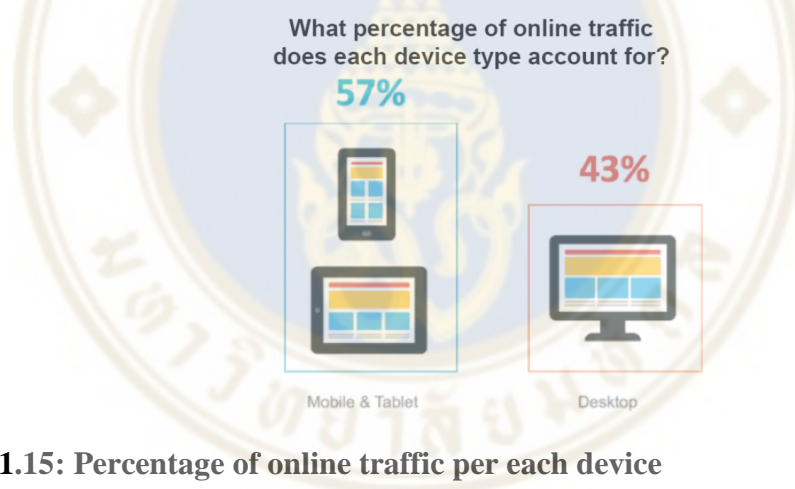


Figure 1.15: Percentage of online traffic per each device

(Source: Brightedge Research, 2017)

1.4.6 Shift from desktop to mobile expands. The revenue of mobile is increasing starting from 2012, till it competes and overcomes the revenue of non-mobile such as laptop in 2017. Growth rate (CAGR), 2008-2017, of 15.4%. The only annual growth rate (CAGR) of 76.8%, reflecting an increase in total revenues from 2012 – 2017 of mobile.

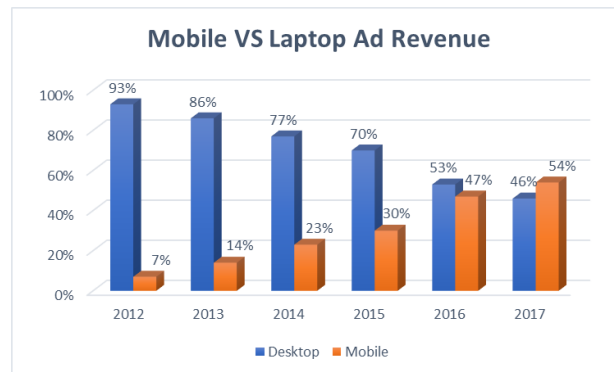


Figure 1.16: Percentage change of revenue between mobile and Laptop ads revenue

(Source: <https://www.iab.com/wp-content/uploads/2017/12/IAB-Internet-Ad-Revenue-Report-Half-Year-2017-REPORT.pdf>)

Nowadays, a shift towards using mobile continue increasing. Mobile ad revenues continued to gain share, representing 54% in 2017 revenues, as compared to 47% in 2016 and 30% in 2015.

1.5 Industry Analysis

Industry Analysis: Digital advertising spending worldwide's growth remains healthy

1.5.1 Digital advertising spending worldwide suggests a strong and consistent growth pattern: Digital advertising spending worldwide from 2015 to 2017 with a forecast towards 2020 show a steadily rising trend with CAGR of 16%.

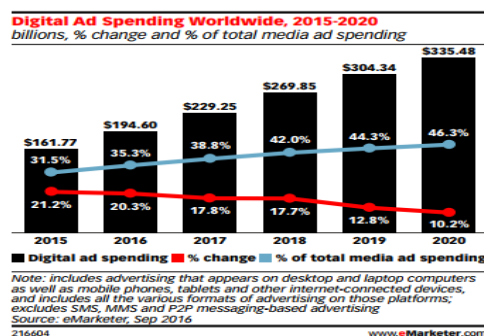


Figure 1.17: Digital ad spending forecast

(Source: eMarketer.com)

1.5.2 Facebook is growing faster than the industry: The growth of Facebook revenue is approximately 50% CAGR given the same timeframe as the growth of total digital advertising spending which is only 16% mentioned in the previous bullet. This means that Facebook is taking on the market share of other social media platforms as well as traditional World-wide-web website as people increasingly spend more time on Facebook and Facebook's family apps.

1.5.3 Global internet advertising spending is expected to surpass TV in 2017: Internet or digital advertising spending has been seen on its exponential growth since 2007 and expected to surpass TV this year (2017). This is in line with the rise of mobile phone era when Apple inc. introduced iPhone 10 years ago. It is apparent that the dollars have been gradually shifted from traditional media (where TV is the biggest portion) to digital since then. Even though it has already been 10 years of mobile era, but we believe that this is just only the beginning. By observing people around us, TV is no longer the main place to attract human's eyeballs but rather mobile devices.

1.5.4 The overall growth outlook of total media ads spending worldwide (traditional plus digital) are still compelling: World's total media ads spending are still growing approximately 5-7 % along with the growth of world's GDP. Taking a closer look into the global ads spending including both traditional and digital media, Facebook's 2016 revenue is accounted for only 5% of the total global ads spending (traditional + digital ads). We believe that this is why there are still a lot of potential for Facebook to grow.

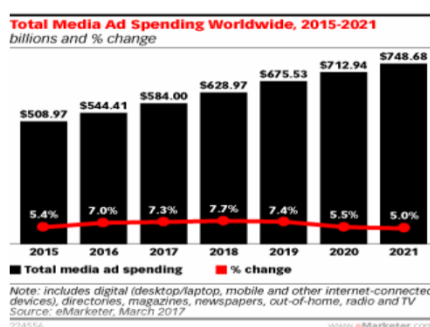


Figure 1.18: Total Media Ad Spending Worldwide, 2015-2021

(Source: eMarketer.com)

1.6 Competition Analysis:

Facebook is holding a 16% of market share in global digital advertising. While the number 1 is Google holding 33% of market share. The rest belongs to general world-wide-web websites and other small social media brands such as Twitter, Snapchat, LinkedIn. None of which possess market share over 4%.

The dominance of Google and Facebook
In the digital ad market, everyone else is begging for scraps

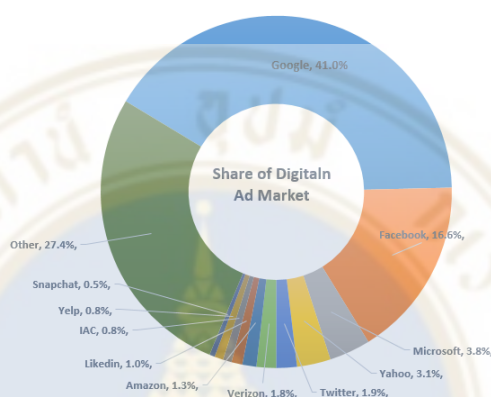


Figure 1.19: Share of digital ad market

1.6.1 Direct competitors: It is quite obvious that there are only two big major players in the global digital advertising market which are Google and Facebook. Therefore, it seems Facebook and Google are the direct competitors to each other's in this arena. However, we have to understand first that digital advertising are actually divided into two big segments which are search-ads and display-ads. Approximately, each of which take half of the whole global digital ads. Google's advertising revenue is classified under search-ads. While Facebook's advertising revenue is classified under display-ads. This seems that Google and Facebook are sharing the same global digital advertising dollars but still they are in different segment. Nevertheless, since after Google monetize Youtube and Facebook are implementing video first strategy, it seems they are stepping more into each others' arena. Therefore, the most powerful competitor of Facebook is apparently Google. While other social media brands such as Twitter, Snapchat, LinkedIn, Line can not at all compete with the massive user base that Facebook has.

After search-ads is becoming more saturated, Google then explores on its other family of applications mainly youtube. Youtube currently contributes about 20% of the total revenue to the whole Alphabet group (Google's parent company) and this portion will become bigger as it gradually replaces traditional TV channel. At the same time, Facebook also see the big opportunity in this area. Therefore, Facebook set a focus on video first strategy that aims to make all static content in Facebook become dynamic that will eventually enlonger the users' time spending on Facebook and its family of applications. Content wise, Youtube seems to be ahead of Facebook on the quantity and quality of contents as Youtube has established the Video database for more than a decade while Facebook has just started in couple years back. However, due to the interaction such as Like, Love, and all other Facebook expression make the content in Facebook platform more lively and interactive. This could be the reason that will make Facebook potentially overtake Youtube in terms of users' experiences. Consequently, this makes the two companies compete head-to-head in this Video first arena. It is also worth to note that even they are seriously competing with each other as mentioned but still the market are big enough for both of them to grow and both of them will gradually take on the portion of traditional TV channel until finally very few could survive. We can see some TV show that have to shut-down and migrate to Facebook live such as "Woodie's talk" for example. And there are no expenses incurred for broadcaster.

1.6.2 Indirect competitors: We could say that any media that would take the users' eyeball away from Facebook could be its indirect competitors. Examples of indirect competitors of social media are such as traditional TV and Online Game. The average time people spend watching TV is 150 minutes (according to statista.com) which is still 3x of the average time people spend on Facebook platform (50 minutes). However, due to the relevancy and audience targeting algorithm, Facebook is able to reach audience in a more efficient way than traditional TV.

Online gaming is also gaining more popularity through the use of mobile devices such as mobile phones and tablets. It is estimated that in 2017, there are about 190 million gamers in US&Canada. While the number of monthly active users of Facebook is about 230 million in the same US&Canada region. We could also see a trend that the countries that getting wealthier, people would have more leisure time to

seek for other entertainments. China is a good example on this that the online gaming industry has grown exponentially. However, Facebook platform also offer some social media gaming that could more or less take the shares from this big online gaming market.

1.6.3 Five Force Analysis

Reference to Five Forces Analysis of Facebook, the average of all 5 parts is moderate force. But Facebook must address these external factors (in the below explanation) to maintain its position as the top player in the social media and advertising market. In addition, Facebook should have concentrated on bargaining power of customers and threat of substitute products as the strongest forces. Moreover, all external factors in the online display advertising industry and social media market environment are significantly affect to Facebook's business performance. According to five forces analysis recommendation, it shows that Facebook must satisfy its customers to reduce potential negative effects of competition and substitution against its social networking website and related offerings.

The following are the strengths or weaknesses of the Five Forces that influence Facebook Inc.'s business:

1.6.3.1 Competitive rivalry within the industry (Moderate force); even Facebook is the leading in online social media market position, Facebook experiences in the negative affect from the competition within industry. There are only a small number of companies that offer online advertising services like Facebook. For example, YouTube (owned by Google) has a social media website that also offers a similar products via online advertising service but its hit a low force to Facebook. However, the variety of these competitors help attract advertisers, thereby imposing a moderate force in Facebook's industry environment. In addition, the low difficulty of transfer from one provider to another, make it easier for advertisers to shift away from Facebook to competitors. Therefore, competitive rivalry within the industry create the moderate force of competition. Based on this element, competitive rivalry is a major consideration of Facebook.

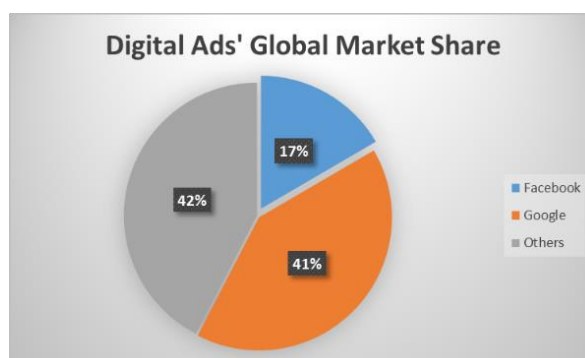


Figure 1.20: Digital Ads' Global Market Share

(Source: <https://www.profitconfidential.com/stock/3-charts-facebook-stock-best-tech-stock/>)

1.6.3.2 Bargaining power of customers (High force), there are a variety of advertisement such as television, radio and print media, all of these are widely available and effective in reaching to customers. Facebook provides social media services to its members/users. However, the digital ads are the primary source of revenues. These members or users have the option to use other ways to advertise which are highly available. These may create a strong force to Facebook. In addition, it is easier for customers to shift away from Facebook's social networking website and related services to substitutes. Therefore, the bargaining power of customers of Facebook is relatively low.

1.6.3.3 Threat of new entrants (Low force); Facebook faces the negative effects of new entrants on the advertising industry environment. Nowadays, there are many new entrants coming to this industry but actually, it is difficult to develop a popular and reliable social media brand similar to Facebook's. In addition, it is also difficult to build the loyalty of advertisers and users/members. Therefore, threat of new entrants is difficult to fight with Facebook.

1.6.3.4 Bargaining power of suppliers (Low Force); suppliers are influence Facebook's social networking website and display advertising services on hardware and software. Facebook's suppliers who provide servers and related computing and network technology/equipment, as well as office supplies. However, these suppliers are widely available in the market, as there are many manufacturers of such equipment and materials. In relation to this, the widely available of suppliers in the market minimizes the influence of individual suppliers on Facebook. Moreover,

suppliers make none trouble in Facebook's online advertising industry environment. Therefore, bargaining power of suppliers is relatively low influence to Facebook.

1.6.3.5 Threat of substitute products (High Force); substitute products could potentially reduce Facebook's business performance. It is easy for advertisers to pay for substitute products, such as television and print advertising, instead of paying for Facebook's social media advertising. However, many of these substitute products, especially television advertising, are more expensive than Facebook's advertising services.

1.7 Investment Summary

1.7.1 Facebook platform user growth & engagement are compelling:

Since 2014, we see the trend of MAU and DAU Y/Y growth has been picking up. MAU has grown 13%, 14% and 17% in 2014, 2015 and 2016 respectively. 2017F's MAU growth is estimated to be in the range of 16-17%. Despite the existing huge user base, the Facebook platform still able to demonstrate growth behavior which is a good sign. Moreover, Instagram has been successfully added users in a highly accelerated pace since they are able to replicate the user bases from Facebook. Recently, It took less than 6 months to add another 100 million users into Instagram and we could see the trend of this adding rate (months per new users) is reducing which mean it could take less time to add another 100 million users to Instagram platform. Moreover, it is estimated that every human in this world spend approximately 54 mins per day across Facebook application families including Instagram and Messenger.

1.7.2 Several key product changes in medium term (5 years) allow tremendous opportunities for monetization: There are several key product changes to Facebook across the application families namely **(i) Video-first emphasis and monetization:** Facebook is in the processing of rolling out Video ecosystem aiming to transform all static into dynamic contents. There have been some developments on these such as "Sound on" in the news feed plus more live video integration, video tab on

Facebook application, mid-roll ads during live streaming just recently launched and vertical video stories ads on Instagram stories. We see a large opportunity on video monetization but it still remains early days. **(ii) Transitory stories:** Facebook has implemented transitory stories across all the family of applications. For examples, Instagram my stories, WhatsApp status, Messenger Day, Facebook stories. Transitory stories focus on disappearing message&Vdo within a day. These could help users to feel less pressure in sharing perfect photo or Vdo, instead sharing more in-the-moment experiences which leads to an increase in organic sharing & engagement. And eventually, lead to the opportunity for monetization. **(iii) Enhanced camera functionality:** Facebook is also focusing itself on camera-first strategy by implementing new ways to customize and enhance photos & Vdo through editing tools and camera supplements text by the use of augmented reality(AR) technology. Consequently, this will bring about more users' engagement and time spending leading to opportunity for monetization afterwards.

1.7.3 Solid picture on 10 years roadmap in connectivity, AI and AR/VR: There are half of the world's population that still do not have access to internet. Facebook has established an organization to promote the free internet for poor countries together with an attempt to connect the rest of the world through internet.org project. In 2016, Facebook successfully launched the prototype of Aquila, internet broadcasting drone fully powered by solar panels. It is aimed to be used for beaming the internet connectivity for the unconnected area and it can be hovered on the same altitude as Boeing airplane for months. In the next 10 years, Facebook targets to launch ten thousand plus of Aquila in order to accomplish this initiative. Moreover, not only Facebook but also other technology companies such as SpaceX, Onweb that also have the same initiative to connect the unconnected world. The project is to launch 4,000+ of low orbital satellites flying on the altitude of 1,150 km to 1,275 km above the earth. Each satellite weigh 386 kg and could cover an ellipse about 2,120 km wide. These low orbital satellites are light and cost effective relatively to normal satellite. Elon Musk, founder of SpaceX, expects that the project could be accomplished within 10 years' time. Given more internet users, it would bring more opportunity for Facebook and internet industry to expand almost indefinitely.

Moreover, AI is also another element in the 10 years roadmap. Some applications of AI being used by Facebook are (i) the news feed customization for specific user as each individual users see the news feed differently based on one's preference (ii) Facebook Messenger Chat Bot, which is automatic response system that can answer the user without a need to have the real people on another side. One of the promising use case of Chat Bot is a call center as customers do not want to wait indefinitely on the phone when contacting customer service. Facebook is still in the early phase of developing Chat Bot to be as capable as human, if success, it will significantly boost the organic usage of Facebook Messenger which again leads to monetization opportunity.

Lastly, AR/VR, it is still a bit too far for solid picture how AR/VR will look like on Facebook and its family of applications. During the recent F8 conference where Facebook invited all developers from around the world to visit the Facebook headquarter and listen to all of the latest showcases of all Facebook's technologies, Facebook had also demonstrated some use cases how AR/VR will be used in the social media world. We believe AR/VR will completely revolutionize the way people communicate in the future.

1.7.4 Low operating cost due to scalability leading to extraordinary high operating and net profit margin: Due to scalability and the massive users base, Facebook is able to efficiently monetize the users base. From figure 13, we can see that operating and net profit margin of Facebook are far beyond the industry. However, it is worth to note that Facebook has just changed the accounting standard to be fully aligned with US GAAP which make the effective tax rate lower than normal for 2017. Normally, Facebook's net profit margin is in the range of 25-30%, still higher than the industry.

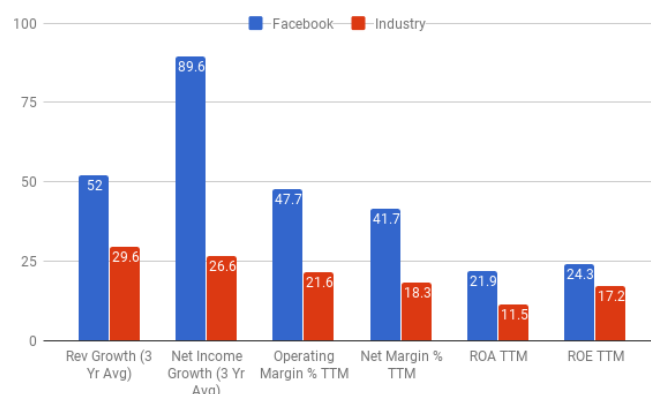


Figure 1.21: Facebook vs. Industry key financial ratio

1.7.5 Facebook has no debt and full with tremendous amount of cash for any good acquisition opportunity: As of Q3, 2017, Facebook has 35 billion USD cash on hands which is almost equivalent to the revenue it made during the past 4 quarters. This demonstrates that Facebook has plenty of cash to spend for any acquisition opportunity. An example is the case when Facebook acquired Instagram in 2012 with the price of 1 billion USD. Currently, Instagram is valued at approximately 32 billion USD. The acquisition does not only bring in technology but also the talented human resources.

1.7.6 The most attractive valuation in the tech industry: Facebook P/E ratio of 2017F and 2018F are 34.5 and 26.5 respectively. With the expected growth of 30%, 2017F PEG is 1.15 given estimated growth of 30% which is lower than 2017F PEG of Alphabet which is 1.7 given the estimated growth of 20.7%. Not to mention about PE of other technology stocks such as Amazon, Netflix (PE 100+); Alibaba, Tencent (PE 50+) which far out-range of Facebook given similar growth prospect.

1.8 Valuation

We use **Discounted Cash Flow Model: Free Cash Flow to Firm (FCFF)** to evaluate the target price. By using FCFF model, we came up with EV of 243.93 USD/share, with Cash and marketable securities on hand of 12.98 USD/share and no

interest bearing debt. We have arrived fair value of Facebook at 256.91 USD/share which represent 44% upside from market price of 179 as of the report issue date.

Value per share	USD
Value of firm (EV)	243.93
Cash + marketable securities	12.98
Value of interest bearing debt	0.00
Share price (Fair value)	256.91
Current share price	179.00
% Upside	44%

Figure 1.22: Summary of FCF result

1.8.1 The Weight Average Cost of Capital using to come up with the table above. WACC is 7.80%. The assumption that make up each component of WACC are as follows:

- a) Weight of debt is 0% since Facebook fully finance by equity
- b) Weight of equity is then 100%
- c) Cost of debt is 0%
- d) Cost of equity is 6.86% with consists of:
 - i) Beta is 1.03, which is the adjusted beta of Facebook relatively to the market (S&P index)
 - ii) Risk premium is 4.92% (Source: http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/implpr.html)
 - iii) Rf is 2.73% , refer to 10 years long term composite rate of US government bond; (Source: <https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=longtermrate>)

1.8.2 Ten-Years Projected Cash Flow Assumptions:

The ten-year projected cash flows are stemmed from increasing in revenue which are from ads on mobile devices and advertising revenue growth that are continued increasingly. Facebook's revenue has been significantly increased since the company went public in 2012. Factors influence advertising revenue growth include

- i) an increase in average price per ad,

ii) an increase in users and their engagement, and
iii) an increase in the number and frequency of ads displayed on mobile devices.

1.8.2.1 Growth rate assumption: As it becomes near the end of 2017, the expectation of earning growth is around 50%, seeing from historical trend. Then, we see that the revenue of Facebook tends to continue to increase year-on-year and in the near future (5 years term), based on the assumption of digital ads marketing growth of 16% (CAGR) and total global ads (traditional + digital) growth of 6%. If we add the growth of these two together, the growth will be around 22%. However, since Facebook is growing faster than the industry. We then give an estimated growth of Facebook to be 30% for the next 5 years and start to decline linearly until it reaches 2.44% (average world's GDP) in year 10. 30% growth during high growth period is also in line with analysts' consensus.

1.8.2.2 Cost of revenue: Cost of revenue is constantly increasing as Revenue increase. Cost of revenue forecast is taken from the historical average. Therefore, it should be counted as 20% from revenue each year.

1.8.2.3 Research and Development growth steady: Research and development expenses growth significantly since IPO (2012). Facebook needs to expand products to their customers which requires more employees headcount in engineering and other technical function involved. In 2017, Facebook plans to continue to accelerate the hiring of software engineers and other technical employees and increase investment to support research and development initiatives. Facebook always have to do research and development and launch new features and products. Therefore, we assume that Facebook has to put a heavy focus on R&D. Furthermore, we expect that R&D will increase as 35% as a proportion of revenue for 5 years which Facebook is in the growth stage of business cycle and must be put heavily invest in research and development, after that Facebook tends to be decline as mature stage of business cycle. Therefore, we reduce the percentage to be 30% as proportion of revenue for the year onwards.

1.8.2.4 Higher investment in Short-term investment: The principal sources of liquidity are cash and cash equivalents, marketable securities, and cash generated from operations. Marketable securities consist mostly of cash on deposit

with banks, investments in money market funds, and investments in U.S. government securities, U.S. government agency securities, and corporate debt securities. We estimate that Facebook holds cash as 32% to the proportion of total assets based on historical data.

1.8.2.5 CAPEX: Since getting into IPO (2012), Facebook has invested heavily on Property and equipment. As mentioned earlier, Facebook needs to expand to reach the people which are unable to access internet in the rest of the world. Therefore, Facebook has to implement server rooms, cloud infrastructures which are mostly depreciated in more than 10 years. We expect Facebook will have to invest heavily in PP&E by assuming growth rate as 50% during high growth and 30% during lower growth period afterwards. For depreciation expenses, we constantly use the percentage of historical data which is around 27% of Gross Property and Equipment. It is classified as accumulated depreciation using straight line method.

1.8.2.6 Marketing and sales expenses: These expenses are quite stable which is around 13% based on historical data. Therefore, we assume that the increasing rate should be 13% of sales. It consists of salaries, share-based compensation, and benefits for employees engaged in sales, sales support, marketing, business development, and customer service functions. It also includes marketing and promotional expenditures, as well as amortization of intangible assets.

1.8.2.7 Interest expenses: Facebook maintains very minimal debt outstanding as well as interest expense, both in the past and present. However, we are conservative as in the future, Facebook may have to borrow some money from financial institutions. Therefore, we assume that the interest expenses should be approximately 1% of long term liabilities during the year.

1.8.2.8 Other income (expense): It consists of 3 parts which are interest income, Foreign exchange gain (loss) and others. Interest income: it sharply increases because it is driven by higher invested cash balances and interest rate. Mostly it comes from the investment in marketable securities, therefore, we assume that the interest income comes from average 1% of marketable securities at year-end (which is based on historical data since IPO). Foreign exchange gain (loss): from 2014, the Company has a decrease in foreign exchange losses resulting from the periodic re-measurement of foreign currency balances. As it is immaterial amount, therefore, we

assume that it is stable from 2016 onwards. And last, others: It is immaterial amount; therefore, we assume that it is stable from 2016 onwards.

1.8.2.9 Provision for income taxes: We use the US statutory tax rate as 35%

1.8.2.10 Receivable: It is a normal practice that the receivable of the Company should be in line with revenues (actually, the balance of receivable is not material balances). Therefore, we expect that it should increase 14% as proportion of revenue based on historical information.

1.8.2.11 Accounts payable: According to this balance is not material amount but it has been linked to cost of revenue, therefore, we assume that it should increase 1% of cost of revenue based on historical information.

1.8.2.12 Accrued liabilities: Similar to accounts payable, it should increase 8% of cost of revenue based on historical information.

1.9 Financial Analysis:

1.9.1 Common Size Analysis: When we look at the comparing between competitors by using common size analysis (income statements), we found that **Facebook is having the highest portion of gross profit, operating income, income before taxes and net income.** It seems that the growth rate of Facebook is very high.

Table 1.2: Common size analysis (Income statements)

	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
FB - Gross profit	73%	76%	83%	84%	86%
TWR - Gross profit	59%	60%	68%	67%	63%
GOOG - Gross profit	59%	57%	61%	62%	61%
FB - Operating income	11%	36%	40%	35%	45%
TWR - Operating income	-25%	-96%	-38%	-20%	-14%
GOOG - Operating income	25%	23%	25%	26%	26%
FB - Income before taxes	10%	35%	39%	35%	45%
TWR - Income before taxes	-25%	-97%	-41%	-20%	-13%
GOOG - Income before taxes	4%	7%	10%	10%	8%
FB - Net income	1%	19%	24%	21%	37%
TWR - Net income	-25%	-97%	-41%	-19%	-14%
GOOG - Net income	-1%	3%	5%	6%	3%

In term of common size analysis (balance sheets), we found that;

a) Total current assets; Facebook and Twitter is heavily invest in short term investment in order to them as the most liquidity assets and gain interest income.

b) Total non-current assets; Facebook is much more invest in PPE to attract new customers.

c) Total liabilities; Facebook is lessly borrow money from institutions inspite of Twitter is making much more borrowing the money.

d) Total stockholders' equity; Facebook has a high portion of total stockholders' equity than other competitors as the Company think that if the investors keep the money with the Company, it can generate the return to investors in the large amount.

Table 1.3: Common size analysis (Balance sheets)

BALANCE SHEET	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
FB - Total current assets	75%	73%	34%	44%	53%
TWR - Total current assets	67%	77%	76%	68%	68%
GOOG - Total current assets	13%	13%	12%	12%	11%
FB - Total non-current assets	25%	27%	66%	56%	47%
TWR - Total non-current assets	33%	24%	24%	32%	32%
GOOG - Total non-current assets	23%	19%	20%	19%	17%
FB - Total liabilities	22%	14%	10%	11%	9%
TWR - Total liabilities	130%	12%	35%	32%	33%
GOOG - Total liabilities	24%	21%	20%	18%	17%
FB - Total stockholders' equity	78%	86%	90%	89%	91%
TWR - Total stockholders' equity	-30%	88%	65%	68%	67%
GOOG - Total stockholders' equity	76%	79%	80%	82%	83%

1.9.2 Trend Analysis: When we look at the comparing between competitors by using trend analysis (income statements), we found that Facebook is having the growth than its competitors in term of gross profit, operating income, income before taxes and net income. It seems to be in line with our expectation that the growth rate of Facebook is very fantastic and unbelievable.

Table 1.4: Trend analysis (Income statements)

	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
FB- Gross profit	100%	161%	277%	404%	640%
TWR - Gross profit	100%	212%	509%	792%	850%
GOOG - Gross profit	100%	115%	136%	159%	187%
FB - Operating income	100%	521%	928%	1157%	2310%
TWR - Operating income	100%	815%	691%	577%	469%
GOOG - Operating income	100%	119%	142%	164%	187%
FB - Income before taxes	100%	557%	994%	1254%	2534%
TWR - Income before taxes	100%	809%	723%	666%	550%
GOOG - Income before taxes	100%	108%	129%	147%	180%
FB - Net income	100%	2830%	5547%	6958%	19277%
TWR - Net income	100%	806%	721%	651%	570%
GOOG - Net income	100%	120%	135%	152%	181%

By comparing trend analysis of Facebook to its competitors, we found that all of total assets, total liabilities and total stockholders' equity is very high growth. It

because nowadays, the digital is very popular and more useful for people to connect to each others and it's easier to be a part around the world. Noted for Twitter, the Company heavily invest and develop new technology (tangible assets) starting from 2013 by issuing new common stock. Therefore, the trend in 2013 is very fast moving. But it's unsuccessful, after that the Company make more borrowing from financial institutions in 2014.

Table 1.5: Trend analysis (Balance sheets)

	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
FB - Total assets	100%	118%	266%	327%	430%
TWR - Total assets	100%	405%	671%	774%	826%
GOOG - Total assets	100%	118%	140%	157%	179%
FB - Total liabilities	100%	72%	122%	155%	172%
TWR - Total liabilities	100%	39%	181%	192%	210%
GOOG - Total liabilities	100%	107%	121%	123%	129%
FB - Total stockholders' equity	100%	132%	307%	376%	504%
TWR - Total stockholders' equity	100%	-1190%	-1462%	-1761%	-1857%
GOOG - Total stockholders' equity	100%	122%	146%	168%	194%

1.9.3 Financial Ratio Analysis

1.9.3.1 Gross Profit Margin: From 2012 to 2016, GP Margin of Facebook continues increasing when compare to its competitors. It is resulting from the expected increase in revenue and constant of increase in cost of revenue. Facebook thinks that the Company can generate more revenue by increasing the average price of social ads and increasing in the number and frequency of ads displayed on mobile devices.

Table 1.6: Gross Profit Margin

Gross Profit Margin	2012	2013	2014	2015	2016
Google	63%	60%	61%	62%	61%
Twitter	59%	60%	68%	67%	63%
Facebook	73%	76%	83%	84%	86%

1.9.3.2 Profitability ratio: It mainly focus on Return on Asset (ROA) and Return on Equity (ROE). As in the table below shown ROA (we exclude the balance of total cash from the calculation as the total cash is not an operating asset of companies in this industry), it shows that Facebook has a positive and continuous growth from year-on-year higher than its competitors. It is a good leading that Facebook can give more earning in money by using the less of investment. In this case, even Facebook

heavily invest more on Property and equipment, the revenue generated is higher than the amount invested.

Table 1.7: Return on Asset

ROA	2012	2013	2014	2015	2016
Google	30%	31%	28%	27%	30%
Twitter	-19%	-83%	-35%	-18%	-12%
Facebook	14%	47%	28%	21%	37%

Looking at the ROA according to Dupont analysis, ROA is affected by two things: **operating efficiency**, which is measured by EBIT margin and **asset use efficiency**, which is measured by total asset turnover.

a) **EBIT Margin (EBIT / Revenue)**; Facebook has the largest percentage of EBIT margin than its competitors. In addition, it continues increasing year-on-year while competitors like google is quite stable the same and Twitter has net loss year-on-year.

b) **Asset Turnover Ratio (Revenue / average total assets)**; the Asset Turnover ratio can often be used as an indicator of the efficiency with which a company is deploying its assets in generating revenue. It means that Facebook is highly efficient in order to utilize its assets to generate income.

Table 1.8: EBIT Margin and Asset Turnover Ratio

EBIT Margin	2012	2013	2014	2015	2016
Google	30%	28%	25%	26%	26%
Twitter	-25%	-96%	-38%	-20%	-14%
Facebook	11%	36%	40%	35%	45%
Asset Turnover Ratio	2012	2013	2014	2015	2016
Google	1.01	1.13	1.11	1.06	1.16
Twitter	0.78	0.86	0.91	0.90	0.84
Facebook	1.29	1.32	0.70	0.60	0.83

In addition to ROE, Facebook has become ahead of its competitors. Facebook's ROE measures the Company's profitability by revealing how much profit a company generates with the money shareholders have invested. It means that from year-on-year, Facebook can generate profit to their shareholders continue increasing. Moreover, we expect that high growth of the Company, we should expect higher ROE in the future.

Table 1.9: Return on Equity

ROE	2012	2013	2014	2015	2016
Google	15%	15%	14%	14%	14%
Twitter	32%	-22%	-16%	-12%	-10%
Facebook	0%	10%	8%	8%	17%

Looking at the ROE according to Dupont analysis, ROE is affected by three things: **operating efficiency**, which is measured by profit margin; **asset use efficiency**, which is measured by total asset turnover; and financial leverage, which is measured by the equity multiplier.

a) **Profit Margin (Net income / Revenue)**; Facebook has the largest percentage of profit margin than its competitors. In addition, it continues increasing year-on-year while competitors like google is quite stable the same and Twitter has net loss year-on-year.

Table 1.10: Profit Margin

Profit Margin	2012	2013	2014	2015	2016
Google	23%	23%	22%	22%	22%
Twitter	-25%	-97%	-41%	-23%	-18%
Facebook	1%	19%	24%	21%	37%

b) **Asset Turnover Ratio (Revenue / average total assets)**; the Asset Turnover ratio can often be used as an indicator of the efficiency with which a company is deploying its assets in generating revenue. It means that Facebook is highly efficient in order to utilize its assets to generate income.

Table 1.11: Asset Turnover Ratio

Asset Turnover Ratio	2012	2013	2014	2015	2016
Google	1.01	1.13	1.11	1.06	1.16
Twitter	0.78	0.86	0.91	0.90	0.84
Facebook	1.29	1.32	0.70	0.60	0.83

c) **Equity Multiplier (average total assets / average total equity)**; It is an indicator that companies finance their operations with equity or debt, so a high equity multiplier indicates that a larger portion of asset financing is attributed to debt. In term of Facebook, the equity multiplier is relatively low, it means that the

Company is having asset financing relying more on the shareholders' equity of company rather than debt.

Table 1.12: Equity Multiplier

Equity Multiplier	2012	2013	2014	2015	2016
Google	1.31	1.27	1.25	1.23	1.20
Twitter	- 3.35	1.14	1.54	1.47	1.49
Facebook	1.28	1.16	1.11	1.12	1.10

1.9.3.3 Solvency Ratio: Reference to D/E ratio, Facebook is relatively low percentage when comparing to its competitors. A high debt/Equity ratio means that its competitors has been aggressive in financing its growth with debt which leads to high level of risk. This may result in volatile earnings as a result of the additional interest expenses. As Facebook aware of this, therefore, Facebook is better to keep low or none of debt and pretty much holding cash on hand for the Company safety.

Table 1.13: D/E Ratio

D/E Ratio	2012	2013	2014	2015	2016
Google	31%	27%	25%	23%	20%
Twitter	435%	14%	54%	47%	49%
Facebook	28%	16%	11%	12%	10%

Interest Coverage Ratio for Facebook is definitely higher than its competitors. The interest coverage ratio is used to determine how easily a company can pay their interest expenses on outstanding debt. The lower the ratio, the more the company is burdened by debt expense like Twitter, when Twitter's interest coverage ratio is only around (4.00), its ability to meet interest expenses may be questionable.

Table 1.14: Interest Coverage Ratio

Interest Coverage Ratio	2012	2013	2014	2015	2016
Google	23.67	36.54	235.78	264.09	253.37
Twitter				(4.59)	(3.66)
Facebook	10.55	50.07	217.13	270.65	1,242.70

1.9.3.4 Cash Flow: Increasing along with revenues and margins: As Facebook is a star in the part of portfolio analysis in marketing, there is a

high growth and gain more market share, with no significant or low long-term debt and more than 12 times quick ratio, which shows no trouble on debt repayment. For all 3 ratios under liquidity ratios, Facebook has the ability to pay its debt which is better than its competitors. In addition, according to the high of the amount of cash and liquidity on hand, Facebook is gradually invest more and more in research and development and property and equipment in order to gain more customers satisfaction and addict to the function of Facebook itself.

Table 1.15: Cash Ratio, Quick Ratio and Liquidity Ratio

Cash Ratio	2012	2013	2014	2015	2016
Google	3.35	3.69	3.83	3.78	5.15
Twitter	3.86	9.93	9.19	6.91	6.46
Facebook	9.15	10.41	7.86	9.58	10.24
Quick Ratio					
Google	3.90	4.25	4.39	4.38	6.00
Twitter	4.88	11.03	10.25	8.17	7.58
Facebook	9.83	11.42	9.04	10.91	11.63
Liquidity Ratio					
Google	4.22	4.58	4.80	4.67	6.29
Twitter	5.04	11.44	10.80	8.66	7.97
Facebook	10.71	11.88	9.60	11.25	11.97

1.10 Investment Risks

1.10.1 Macro environment Risk

1.10.1.1 FED interest rate is on the rising trend: Since financial crisis in 2008, FED has been lowering the interest rate to boost up the economy. But starting from 2015, FED has announced QE tapering and also to increase FED fund rate. This implication could raise risk free rate, as a result higher cost of equity leading to higher WACC which reduce the FCFF impacting valuation of the company. If the return from fixed income asset is higher due to FED rate hike, there could be a potential risk to all risky assets globally.

1.10.1.2 Political tension from Trump's administration: After Donald Trump was elected in 2016, there have been many risks imposed from his

administration such as the political tension in North Korea and recently supporting the announcement of Jerusalem to be the capital city of Israel. However, the likelihood that his administration will lead to a war is low, but there is a small chance that it could happen. If world's or regional war were to occur, the media industry will be one of the first industry to be affected.

1.10.2 Operational Risk

1.10.2.1 Slower engagement, especially in younger demographics & more mature markets: We have seen some evidences of slower engagement in the US younger demographics. For example, Snapchat has gained popularity from US teenagers where they feel having more privacy and not being monitored by their parents on Facebook.

1.10.2.2 Slowdown in shift of advertising dollars from TV and traditional media: We have seen that digital advertising revenue is surpassing traditional TV in 2017. Even though, we see that is not likely to happen. But there could be some chances that digital advertising is not growing as fast as we expect and it could potentially impact the growth of Facebook.

1.10.2.3 Privacy and Security risks: Facebook is holding all kind of individuals data such as biography, places visited, lifestyle, day-to-day activities, preferences, etc. These could impose some risks to Facebook if these data are not securely kept or get stolen by hackers.

1.10.2.4 Share structure and Mark Zuckerberg's control: Class B shares have been issued for only executives of Facebook which have 10x voting right than Class A shares. This makes Mark Zuckerberg, CEO of the company, still hold the majority of voting power of Facebook inc. There could be a case where he does not instruct the board of directors to follow the vision of the company but the likelihood would be low due to his passion about his own company and the proven records of his leadership since Facebook was firstly launched in 2004.

CHAPTER II

ADDITIONAL INFORMATION

2.1 Facebook's Most Important Acquisitions

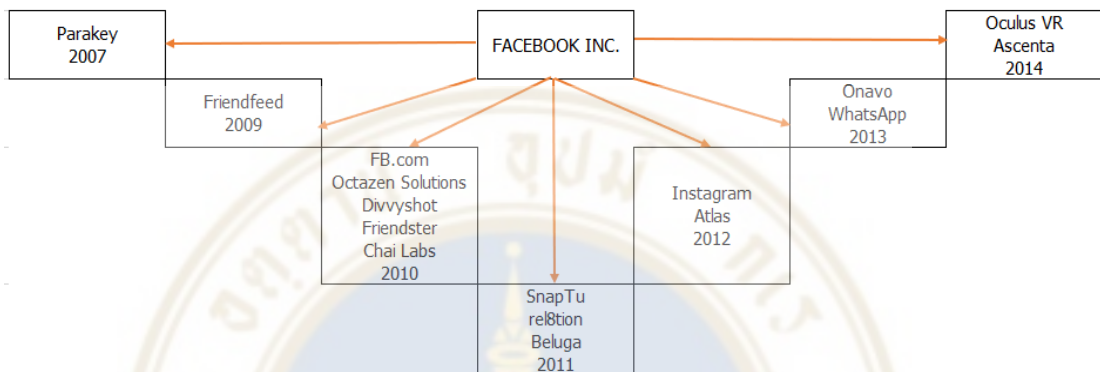


Figure 2.1: Most important acquisition of Facebook

Source: <https://www.investopedia.com/articles/investing/021115/facebooks-most-important-acquisitions.asp>

2.2 SWOT Analysis

2.2.1 Strengths:

2.2.1.1 No. 1 in global social media market and No.2 in digital advertising market: Facebook maintains no. 1 position in the global social media market, while no.2 in the digital advertising market. Facebook holds market share of 16% in the global digital ads market, second to Google. Due to monopolistic position in the market, Facebook is able to monetize its users base efficiently through the economy of scales from its ecosystem. To elaborate, Facebook has installed data center and servers across the globe which is a very extensive investment but due to its high users' base, pay back could be easily achieved.

2.2.1.2 Visionary of Facebook's CEO: We would have to accept that Facebook's CEO has remarkable visionary. Mark Zuckerberg used to give an interview how he came up with Facebook. He revealed to the press that he noticed the behavior of human at the time he firstly launched a tool to share the course that each individual Harvard's student registered. He observed the students spending significant amount of time through clicking and browsing on other profiles which was abnormal at that time. But he realized that virtual socialization could be a basic need for human in the next century. Then he came up with an idea to apply this sharing course website and transform it to be Facebook nowadays. He believed that why can't this kind of application be used to the rest of the world instead of just only Harvard university.

2.2.1.3 Strong network effect from massive users' base: Due to massive users' base, this creates strong network effect which lead to high switching cost if a user were to switch to use other platforms. Users then would have to stay in the Facebook ecosystem to stay connected with friends, family, pages, news channel, celebrities they like. We believe there is no other social media in the world that could establish its massive users' base as same as Facebook.

2.2.1.4 Ability of ads targeting yielding superior ROI than traditional ads: Facebook ads yield higher ROI than any traditional media as much as 5x. This is according to the ability of advertiser to select targets based on age, gender, demographic for examples. These kinds of ads are very effective and create high relevancy based on the needs and preferences of consumers.

2.2.1.5 Substantial amount of cash on hand for acquisition opportunity: Facebook has substantial amount of cash on hand for any acquisition opportunity. The easiest way to expand the business is through acquisition and Facebook has been using this strategy for a while. The most successful acquisition as of now is the acquisition of Instagram in 2012. There were less than 100 million MAUs on the Instagram platform back then, while currently MAUs on Instagram is 800 million and will soon to reach 1 billion. This bring the valuation of Instagram from \$1 billion at the time it was bought by Facebook to about \$32 billion currently. And this took only 5 years. Moreover, Facebook also benefit from acquisition on getting talented resources to fuel the growth prospects of the company.

2.2.2 Weaknesses:

2.2.2.1 Challenges to sustain high revenue growth rate given the high base of MAUs: Facebook MAUs has reached 2 billion, while the world's population that have access to internet is approximately 3.5 billion. The bigger user base could be a concern how Facebook could grow further. It might not grow at explosive rate as it was in the past.

2.2.2.2 Weak conversion rate of ads: Critics have questioned Facebook on conversion rate which measures whether or not purchases occur after an ad is clicked. Google AdWords is claimed to better than Facebook in the conversion rate.

2.2.2.3 Heavy reliance on ads revenue: According to the Facebook's revenue structure, 98% of total revenue comes from advertising. This means it heavily relies on the revenue coming from advertising. In case of global financial crisis or any economic downturn, it could negatively affect Facebook.

2.2.2.4 Dependence of the business on a few key personnel: Two main person behind the success of Facebook are Mark Zuckerberg (CEO) and Sheryl Sandberg (COO). Both of them have been working side-by-side until Facebook could become a profitable company. Sheryl Sandberg is the key person who can make this happens while Mark Zuckerberg focus on the mission and vision of the company. Therefore, if there happens to be a cause making these people leave the company, the company could be adversely affected.

2.2.3 Opportunities:

2.2.3.1 Diversification of revenue sources through Facebook's application ecosystem: There are other growth engines that Facebook still not monetize such as Video, WhatsApp, Facebook Messenger.

2.2.3.2 Increase revenue through the increase of ads price due to ads supply overload: Due to the growth of users, groups, pages, News feed is not enough to display everything users need. In order for advertising pages to pop up at the top of the feeds to gain interest from consumer. They would need to pay more in order to get the attention. This creates opportunity for Facebook to increase ads price.

2.2.3.3 Entering Chinese market via negotiations with the government or through other application in the Facebook ecosystem: China is a huge internet market, WeChat the most popular social application in China has almost 1 billion of MAUs. However, Facebook is prohibited in China but if Facebook is successful in negotiating with Chinese government. It could open itself to the giant internet market but it is not quite easy. Nevertheless, WhatsApp is not prohibited in China. Therefore, there are some chances that Facebook could open up the ecosystem there.

2.2.3.4 Opportunities to expand business to the unconnected part of the world: There are still 50% of the world's population that still do not have access to internet. Aquila drone (Facebook's internet.org project), together with low orbital satellite of SpaceX, OneWeb could power the rest of the world with internet connectivity. As a result, it will bring more users to Facebook platform.

2.2.4 Threats:

2.2.4.1 Cyber security threats: Cyber security threats are getting more aggressive as most of individuals' information and credentials are kept online nowadays. This creates an incentive for hacker to steal valuable information. Facebook is holding gigantic amount of credentials of almost half of the world's population. In case data centers of Facebook got intruded, it will adversely affects the reputation of the company and risk losing user bases that are loyal to its platform.

2.2.4.2 Integration of newly acquired businesses: Since Facebook has heavily acquired many startups companies into its portfolio. There could

be some difficulties to blend in the culture of young startups company into the big corporation like Facebook.

2.2.4.3 Increasing popularity of display ads from Alphabet's application ecosystem: Alphabet has been stepping into the display ads arena through YouTube. YouTube could potentially steal the eyeballs from Facebook users since YouTube has established gigantic VDO database where ones can find any content they want. Moreover, YouTube also recently launched live VDO feature which has similar functionality to Facebook live.

2.2.4.4 Scrutiny from regulators on fake news and monopolistic position in the market: Facebook has recently been eyed on fake news on its platform. Executives of Facebook had to meet with Congress members on how the company should handle the cases. Regarding monopolistic position in the market, recently there was a case that Google was fined at a cost of 2.7 billion USD against Antitrust law of EU commission. Given the same monopolistic position in the market, Facebook is also risked of getting fined on the similar case as Google. Note that there are still some allegation pending on Facebook but the cases have not been sentenced.

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. No.1 in global social media market and to be No.2 in digital advertising market 2. Visionary of Facebook's CEO 3. Strong network effect from massive users' base 4. Ability of ads targeting yielding superior ROI than traditional ads 5. Substantial amount of cash on hand for acquisition opportunity 	<ol style="list-style-type: none"> 1. Challenges to sustain high revenue growth rate given the high base of MAUs 2. Weak conversion rate of ads 3. Heavy reliance on ads revenue 4. Dependence of the business on a few key personnel
Opportunities	Threats
<ol style="list-style-type: none"> 1. Diversification of revenue sources through Facebook's application ecosystem 2. Increase revenue through the increase of ads price due to ads supply overload 3. Entering Chinese market via negotiations with the government or through other application in the Facebook ecosystem 4. Opportunities to expand business to the unconnected part of the world 	<ol style="list-style-type: none"> 1. Cyber security threats 2. Integration of newly acquired businesses 3. Increasing popularity of display ads from Alphabet's application ecosystem 4. Scrutiny from regulators on fake news and monopolistic position in the market

Figure 2.2: SWOT Analysis Summary

2.3 Income Statements

Table 2.1: FB's Income statements

Income Statement (USD in millions)	2012A	2013A	2014A	2015A	2016A	2017F	2018F	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Revenue	5,089	7,872	12,466	17,928	27,638	41,457	53,894	70,062	91,081	118,405	153,927	192,409	230,890	265,524	292,076	306,680
Cost of revenue	1,364	1,875	2,153	2,867	3,789	8,291	10,779	14,012	18,216	23,681	30,785	38,482	46,178	53,105	58,415	61,336
Gross profit	3,725	5,997	10,313	15,061	23,849	33,166	43,115	56,050	72,865	94,724	123,142	153,927	184,712	212,419	233,661	245,344
Operating expenses																
Research and development	1,399	1,415	2,666	4,816	5,919	14,510	18,863	24,522	31,878	41,442	53,874	57,723	69,267	79,657	87,623	92,004
Marketing and sales	896	997	1,680	2,725	3,772	5,389	7,006	9,108	11,841	15,393	20,011	25,013	30,016	34,518	37,970	39,868
General and administrative	892	781	973	1,295	1,731	1,731	1,731	1,731	1,731	1,731	1,731	1,731	1,731	1,731	1,731	1,731
Total operating expenses	3,187	3,193	5,319	8,836	11,422	21,630	27,600	35,361	45,450	58,566	75,616	84,467	101,014	115,906	127,324	133,603
Operating income	538	2,804	4,994	6,225	12,427	11,535	15,515	20,689	27,415	36,159	47,526	69,460	83,698	96,513	106,337	111,741
Interest Expense	51	56	23	23	10	29	29	29	29	29	29	29	29	29	29	29
Other income (expense)	7	6	-	61	8	101	119	156	209	286	399	378	667	921	1,169	1,385
Income before taxes	494	2,754	4,910	6,194	12,518	11,626	15,642	20,869	27,672	36,528	47,875	70,098	84,591	97,653	107,693	113,344
Provision for income taxes	441	1,254	1,970	2,506	2,301	4,069	3,285	4,382	5,811	7,671	10,054	14,721	17,764	20,507	22,616	23,802
Net income from continuing operations	53	1,500	2,940	3,688	10,217	7,557	12,357	16,486	21,861	28,857	37,821	55,378	66,827	77,146	85,077	89,542
Net income	53	1,500	2,940	3,688	10,217	7,557	12,357	16,486	21,861	28,857	37,821	55,378	66,827	77,146	85,077	89,542

(Source: Based on estimation and Company's financial statements)



2.4 Balance Sheets

Table 2.2: FB's Balance Sheets

Balance Sheet (USD in millions)	2012A	2013A	2014A	2015A	2016A	2017F	2018F	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Assets																
Current assets																
Cash																
Cash and cash equivalents	2,384	3,323	4,315	4,907	8,903	10,256	11,489	11,757	9,897	3,964	9,226	2,760	2,740	3,111	21,171	33,536
Short-term investments	7,242	8,126	6,884	13,527	20,546	19,438	23,070	28,353	36,064	47,355	45,330	74,206	99,602	124,370	145,968	170,749
Total cash	9,626	11,449	11,199	18,434	29,449	29,694	34,559	40,110	45,962	51,319	54,557	76,967	102,342	127,481	167,139	204,285
Receivables	719	1,109	1,678	2,559	3,993	5,804	7,545	9,809	12,751	16,577	21,550	26,937	32,325	37,173	40,891	42,935
Prepaid expenses	471	461	793	659	959	959	959	959	959	959	959	959	959	959	959	959
Other current assets	451	51														
Total current assets	11,267	13,070	13,670	21,652	34,401	36,457	43,063	50,877	59,672	68,855	77,066	104,863	135,626	165,613	208,989	248,179
Non-current assets																
Property, plant and equipment																
Gross property, plant and equipment	3,273	4,142	5,784	7,819	11,803	17,705	26,557	39,835	59,753	89,629	134,444	174,777	227,210	295,372	354,447	425,336
Accumulated Depreciation	- 882	- 1,260	- 1,817	- 2,132	- 3,212	- 5,130	- 8,007	- 12,322	- 18,796	- 28,505	- 43,070	- 55,130	- 70,807	- 91,188	- 108,083	- 128,358
Net property, plant and equipment	2,391	2,882	3,967	5,687	8,591	12,575	18,550	27,513	40,957	61,124	91,373	119,647	156,402	204,185	246,364	296,979
Goodwill	587	839	17,981	18,026	18,122	18,122	18,122	18,122	18,122	18,122	18,122	18,122	18,122	18,122	18,122	18,122
Intangible assets	801	883	3,929	3,246	2,535	2,535	2,535	2,535	2,535	2,535	2,535	2,535	2,535	2,535	2,535	2,535
Other long-term assets	57	221	637	796	1,312	1,312	1,312	1,312	1,312	1,312	1,312	1,312	1,312	1,312	1,312	1,312
Total non-current assets	3,836	4,825	26,514	27,755	30,560	34,544	40,519	49,482	62,926	83,093	113,342	141,616	178,371	226,154	268,333	318,948
Total assets	15,103	17,895	40,184	49,407	64,961	71,001	83,582	100,359	122,598	151,947	190,408	246,479	313,997	391,766	477,322	567,127
Liabilities and stockholders' equity	16%	16%	10%	12%	13%	18%	22%	27%	33%	40%	48%	49%	50%	52%	52%	52%
Liabilities																
Current liabilities																
Short-term debt				201												
Capital leases	365	239	114	7												
Accounts payable	65	87	176	196	302	83	108	140	182	237	308	385	462	531	584	613
Accrued liabilities	423	555	866	665	1,961	663	862	1,121	1,457	1,894	2,463	3,079	3,694	4,248	4,673	4,907
Deferred revenues	30	38	66	56	90	90	90	90	90	90	90	90	90	90	90	90
Other current liabilities	169	181	202	800	522	522	522	522	522	522	522	522	522	522	522	522
Total current liabilities	1,052	1,100	1,424	1,925	2,875	1,358	1,582	1,873	2,251	2,743	3,383	4,075	4,768	5,391	5,869	6,132
Non-current liabilities																
Long-term debt	1,500															
Capital leases	491	237	119	107												
Deferred taxes liabilities				163												
Other long-term liabilities	305	1,088	2,545	2,994	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892
Total non-current liabilities	2,296	1,325	2,664	3,264	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892	2,892
Total liabilities	3,348	2,425	4,088	5,189	5,767	4,250	4,474	4,765	5,143	5,635	6,275	6,967	7,660	8,283	8,761	9,024
Stockholders' equity																
Convertible preferred stock																
Additional paid-in capital	10,094	12,297	30,225	34,886	38,227	38,227	38,227	38,227	38,227	38,227	38,227	38,227	38,227	38,227	38,227	38,227
Retained earnings	1,659	3,159	6,099	9,787	21,670	29,227	41,584	58,070	79,931	108,788	146,609	201,987	268,813	345,959	431,037	520,578
Accumulated other comprehensive income	2	14	- 228	- 455	- 703	- 703	- 703	- 703	- 703	- 703	- 703	- 703	- 703	- 703	- 703	- 703
Total stockholders' equity	11,755	15,470	36,096	44,218	59,194	66,751	79,108	95,594	117,455	146,312	184,133	239,511	306,337	383,483	468,561	558,102
Total liabilities and stockholders' equity	15,103	17,895	40,184	49,407	64,961	71,001	83,582	100,359	122,598	151,947	190,408	246,479	313,997	391,766	477,322	567,127

(Source: Based on estimation and Company's financial statements)

2.5 Statements of Cash Flow

Table 2.3: FB's Statements of Cash Flow

Statement of Cash Flow (Million USD)	2017F	2018F	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Net income for the year	7,557	12,357	16,486	21,861	28,857	37,821	55,378	66,827	77,146	85,077	89,542
Add: Depreciation expenses	1,918	2,877	4,315	6,473	9,710	14,565	12,060	15,677	20,381	16,895	20,274
Operating activities											
Change in Receivables	- 1,811	- 1,741	- 2,264	- 2,943	- 3,825	- 4,973	- 5,387	- 5,387	- 4,849	- 3,717	- 2,045
Change in Accounts payable	- 219	25	32	42	55	71	77	77	69	53	29
Change in Accrued liabilities	- 1,298	199	259	336	437	568	616	616	554	425	234
Cash received from operating activities	6,147	13,717	18,829	25,770	35,234	48,052	62,743	77,809	93,301	98,733	108,035
Investing activities											
Purchases of Property, plant and equipment	- 5,902	- 8,852	-13,278	-19,918	-29,876	-44,815	- 40,333	- 52,433	- 68,163	- 59,074	- 70,889
Cash payment to investing activities	- 5,902	- 8,852	-13,278	-19,918	-29,876	-44,815	- 40,333	- 52,433	- 68,163	- 59,074	- 70,889
Cash receive / (use) during the year	245	4,864	5,551	5,852	5,357	3,238	22,409	25,376	25,138	39,659	37,145
Cash beginning	29,449	29,694	34,559	40,110	45,962	51,319	54,557	76,966	102,342	127,481	167,139
Cash receive / (use) during the year	245	4,864	5,551	5,852	5,357	3,238	22,409	25,376	25,138	39,659	37,145
Cash ending	29,694	34,559	40,110	45,962	51,319	54,557	76,966	102,342	127,481	167,139	204,285

(Source: Based on estimation and Company's financial statements)



2.6 Common Size Analysis (Income Statement)

Table 2.4: FB's Common Size Analysis (Income Statements)

FACEBOOK INC A (FB) CashFlowFlag INCOME STATEMENT	COMMON SIZE					
Fiscal year ends in December. USD in millions except per share data.	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016	30/9/2017
Revenue	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Cost of revenue	26.80%	23.82%	17.27%	15.99%	13.71%	13.88%
Gross profit	73.20%	76.18%	82.73%	84.01%	86.29%	86.12%
Operating expenses						
Research and development	27.49%	17.98%	21.39%	26.86%	21.42%	20.97%
Marketing and sales	17.61%	12.67%	13.48%	15.20%	13.65%	12.11%
General and administrative	17.53%	9.92%	7.81%	7.22%	6.26%	6.61%
Total operating expenses	62.63%	40.56%	42.67%	49.29%	41.33%	39.69%
Operating income	10.57%	35.62%	40.06%	34.72%	44.96%	46.43%
Interest Expense	1.00%	0.71%	0.18%	0.13%	0.04%	0.00%
Other income (expense)	0.14%	0.08%	-0.49%	-0.04%	0.37%	1.02%
Income before taxes	9.71%	34.98%	39.39%	34.55%	45.29%	47.44%
Provision for income taxes	8.67%	15.93%	15.80%	13.98%	8.33%	5.30%
Net income from continuing operations	1.04%	19.05%	23.58%	20.57%	36.97%	42.14%
Net income	1.04%	19.05%	23.58%	20.57%	36.97%	42.14%

2.8 Trend Analysis (Income Statements)

Table 2.6: FB's Trend Analysis (Income Statements)

FACEBOOK INC A (FB) CashFlowFlag						
INCOME STATEMENT						
Fiscal year ends in December. USD in millions except per share data.	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016	30/9/2017
Revenue	100%	155%	245%	352%	543%	544%
Cost of revenue	100%	137%	158%	210%	278%	282%
Gross profit	100%	161%	277%	404%	640%	640%
Operating expenses						
Research and development	100%	101%	191%	344%	423%	415%
Marketing and sales	100%	111%	188%	304%	421%	374%
General and administrative	100%	88%	109%	145%	194%	205%
Total operating expenses	100%	100%	167%	277%	358%	345%
Operating income	100%	521%	928%	1157%	2310%	2389%
Interest Expense	100%	110%	45%	45%	20%	0%
Other income (expense)	100%	86%	-871%	-114%	1443%	4014%
Income before taxes	100%	557%	994%	1254%	2534%	2658%
Provision for income taxes	100%	284%	447%	568%	522%	333%
Net income from continuing operations	100%	2830%	5547%	6958%	19277%	22009%
Net income	100%	2830%	5547%	6958%	19277%	22009%

2.9 Trend Analysis (Balance Sheets)

Table 2.7: FB's Trend Analysis (Balance Sheets)

FACEBOOK INC A (FB) CashFlowFlag BALANCE SHEET						
Fiscal year ends in December. USD in millions except per share data.	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016	30/9/2017
Assets						
Current assets						
Cash						
Cash and cash equivalents	100%	139%	181%	206%	373%	302%
Short-term investments	100%	112%	95%	187%	284%	429%
Total cash	100%	119%	116%	192%	306%	398%
Receivables	100%	154%	233%	356%	555%	615%
Prepaid expenses	100%	98%	168%	140%	204%	316%
Other current assets	100%	11%	0%	0%	0%	0%
Total current assets	100%	116%	121%	192%	305%	392%
Non-current assets						
Property, plant and equipment						
Gross property, plant and equipment	100%	127%	177%	239%	361%	502%
Accumulated Depreciation	100%	143%	206%	242%	364%	486%
Net property, plant and equipment	100%	121%	166%	238%	359%	508%
Goodwill	100%	143%	3063%	3071%	3087%	3103%
Intangible assets	100%	110%	491%	405%	316%	256%
Other long-term assets	100%	388%	1118%	1396%	2302%	4165%
Total non-current assets	100%	126%	691%	724%	797%	907%
Total assets	100%	118%	266%	327%	430%	523%
Liabilities and stockholders' equity						
Liabilities						
Current liabilities						
Short-term debt						
Capital leases	100%	65%	31%	2%	0%	0%
Accounts payable	100%	134%	271%	302%	465%	589%
Accrued liabilities	100%	131%	205%	157%	464%	592%
Deferred revenues	100%	127%	220%	187%	300%	350%
Other current liabilities	100%	107%	120%	473%	309%	186%
Total current liabilities	100%	105%	135%	183%	273%	314%
Non-current liabilities						
Long-term debt	100%	0%	0%	0%	0%	0%
Capital leases	100%	48%	24%	22%	0%	0%
Deferred taxes liabilities						
Other long-term liabilities	100%	357%	834%	982%	948%	1470%
Total non-current liabilities	100%	58%	116%	142%	126%	195%
Total liabilities	100%	72%	122%	155%	172%	233%
Stockholders' equity						
Convertible preferred stock						
Additional paid-in capital	100%	122%	299%	346%	379%	398%
Retained earnings	100%	190%	368%	590%	1306%	1881%
Accumulated other comprehensive income	100%	700%	-11400%	-22750%	-35150%	-10000%
Total stockholders' equity	100%	132%	307%	376%	504%	606%
Total liabilities and stockholders' equity	100%	118%	266%	327%	430%	523%

2.10 Key Financial Ratios

Table 2.8: FB's Key Financial Ratios

Key Financial Ratio	2012A	2013A	2014A	2015A	2016A	2017F	2018F	2019F	2020F	2021F	2022F	2023F	2024F	2025F	2026F	2027F
Liquidity Ratio																
Current Ratio (x)	10.71	11.88	9.60	11.25	11.97	28.83	31.61	33.83	35.25	35.68	35.00	39.68	44.33	48.86	56.57	65.02
Quick Ratio (x)	9.83	11.42	9.04	10.91	11.63	28.12	31.01	33.32	34.82	35.33	34.72	39.44	44.12	48.67	56.40	64.85
Cash Ratio (x)	9.15	10.41	7.86	9.58	10.24	23.85	26.24	28.08	29.16	29.29	28.35	32.84	37.35	41.80	49.46	57.90
Efficiency Ratio																
Total Asset Turnover (x)	0.47	0.48	0.43	0.40	0.48	0.60	0.66	0.69	0.71	0.73	0.75	0.72	0.66	0.59	0.52	0.45
Fixed Asset Turnover (x)	2.63	2.99	3.64	3.71	3.87	3.92	3.46	3.04	2.66	2.32	2.02	1.82	1.65	1.43	1.24	1.05
Acc Receivable Turnover (x)	8.04	8.61	8.95	8.46	8.44	8.46	8.07	8.07	8.07	8.07	8.07	7.92	7.76	7.59	7.42	7.23
Collection Period (days)	45.40	42.38	40.80	43.13	43.26	43.13	45.20	45.20	45.20	45.20	45.20	46.07	47.02	48.07	49.22	50.49
Payables Turnover (x)	21.31	24.67	16.37	15.41	15.22	43.08	113.04	113.04	113.04	113.04	113.04	110.91	108.67	106.31	103.82	101.21
Payables Period (days)	17.13	14.79	22.29	23.68	23.99	8.47	3.23	3.23	3.23	3.23	3.23	3.29	3.36	3.43	3.52	3.61
Cash Conversion Cycle (days)	28.27	27.58	18.51	19.45	19.28	34.66	41.98	41.98	41.98	41.98	41.98	42.78	43.67	44.64	45.70	46.88
Profitability Ratio																
Gross Profit Margin (%)	73.20%	76.18%	82.73%	84.01%	86.29%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
EBIT Margin (%)	10.57%	35.62%	40.06%	34.72%	44.96%	37.82%	38.79%	39.53%	40.10%	40.54%	40.88%	46.10%	46.24%	46.33%	46.38%	46.39%
Net Profit Margin (%)	1.04%	19.05%	23.58%	20.57%	36.97%	24.73%	30.83%	31.43%	31.90%	32.27%	32.57%	36.70%	36.84%	36.95%	37.02%	37.09%
ROA (%)	13.80%	47.14%	27.85%	20.74%	37.69%	41.14%	46.63%	51.07%	53.78%	54.61%	53.69%	58.35%	55.88%	51.00%	45.79%	40.20%
ROE (%)	0.45%	9.70%	8.14%	8.34%	17.26%	14.76%	19.31%	20.37%	21.19%	21.79%	22.23%	23.78%	22.11%	20.11%	17.86%	15.49%
SG&A/ Sales	62.63%	40.56%	42.67%	49.29%	41.33%	42.18%	41.21%	40.47%	39.90%	39.46%	39.12%	33.90%	33.76%	33.67%	33.62%	33.61%
Solvency Ratio																
Debt Ratio (%)	9.93%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Debt to Equity Ratio (x)	0.28	0.16	0.11	0.12	0.10	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.01	0.01
Equity Multiple (x)	1.28	1.16	1.11	1.12	1.10	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.01	1.01
Long Term Debt Ratio (%)	9.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Coverage Ratio (x)	10.55	50.07	217.13	270.65	1,242.70	542.22	722.84	957.65	1,262.90	1,659.72	2,175.60	3,054.36	3,645.44	4,144.17	4,478.39	4,589.12

(Source: Based on estimation and Company's financial statements)

2.11 Free cash flow sensitivity analysis

Sensitivity analysis is conducted based on the variation of two main components that are the top contributors to the FCFF value namely WACC and Growth rate during high growth period. The result is demonstrated in the table below.

		WACC				
	256.91	7%	8%	9%	10%	11%
	10%	(241.17)	(148.76)	(102.88)	(75.60)	(57.60)
Growth during high growth period	20%	(13.07)	(2.88)	2.16	5.14	7.10
	30%	366.06	238.51	175.20	137.56	112.74
	40%	975.98	625.52	451.68	348.42	280.37
	50%	1,929.34	1,228.81	881.52	675.34	539.59

Figure 2.3: Sensitivity analysis

Facebook market share sensitivity analysis

2027 Facebook market share is analysed based on its 5 years growth rate. Alphabet (GOOGL) is also taken into account for this sensitivity analysis. The market share of each company is compared against the total digital ads industry which is growing 15% CAGR. We found that Facebook's 5 years growth rate as 30% makes most sense since both companies will take up approximately 92% of the total digital ads.

FB 5 Yrs Growth	2027 FB Market share	2027 GOOGL market share
20%	20.36%	55.52%
30%	36.05%	55.52%
40%	61.47%	55.52%

Figure 2.4: Facebook market share sensitivity analysis

2.12 Risk matrix

Investment Risks are classified under the risk matrix below to evaluate the likelihood and consequences of each item.

2.12.1 Macro environment risk:

2.12.1.1 FED interest rate is on the rising trend

2.12.1.2 Political tension from Trump's administration

2.12.2 Operational risk:

2.12.2.1 Slower engagement, especially in younger demographics & more mature markets

2.12.2.2 Slowdown in shift of advertising dollars from TV and traditional media

2.12.2.3 Privacy and Security risks

2.12.2.4 Share structure and Mark Zuckerberg's control

		Consequences				
		Marginal	Minor	Moderate	Major	Severe
Likelihood	Almost certain	9.3		9.1		
	Likely					
	Possible				9.2	9.5
	Unlikely			9.4		
	Rare				9.6	

Figure 2.5: Risk Matrix Table

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