"FACEBOOK, INC."

COMPANY REPORT

"INTERNET / SOCIAL MEDIA"

23 MAY 2018

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Fear over regulation exaggerated

…business model is still intact, market neglects strong growth opportunities amidst CA debacle!

- We initiate the coverage of Facebook with a **BUY recommendation** and a **price target of $246** for FY2018, corresponding to an expected **overall return of 35%** (incl. equity contributions). We believe the market is currently **neglecting Facebook's growth opportunities** amid excessive fears over upcoming regulation as a result of the recently revealed data leak.
- **Tremendous top line growth** - with total revenue increasing 54% in 2016, 47% in 2017 and expected to grow 40% in 2018. Main growth drivers are Instagram and Messenger as well as the soon commencing monetization of WhatsApp.
- Q1 FY18 shows **no signs of fleeing advertisers or users** - revenue up 50% y/y, MAU numbers are growing across all regions.
- **Valuation:** We have based our target price on a DCF valuation, forecasting the revenue stream for each core product individually. The model employs a **WACC of 8.52%** and a **terminal growth rate of 3%**.
- **Main risks:** 1) Impact of regulatory changes; 2) Loss of brand trust; 3) Lower engagement & user growth 4) Loss of advertisers; 5) Antitrust regulation; 6) Declining corporate culture; 7) Share structure and CEO's control

Company description

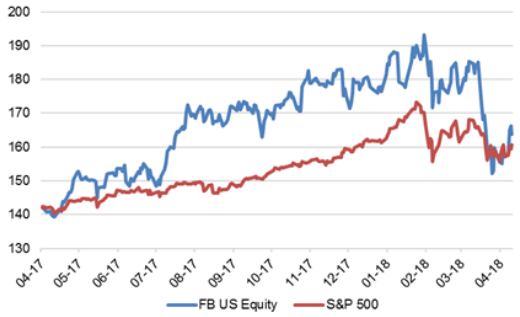
Facebook was founded in July 2004 and is headquartered in Menlo Park, California, USA. Its products enable people to connect, share, communicate and trade with each other; allow brands and businesses to engage with their users through various tools and channels. Currently the company operates the largest social network in the world.

Recommendation:	**BUY**
Price Target FY18:	**246 $**
Price (as of 23-May-18)	**183 $**

Reuters: FB.O, Bloomberg: FB

52-week range ($)	138.8 -195.3
Market Cap ($m)	511,280
Outstanding Shares (m)	2,954
Expected Shareholder Return (%)	35

Source: Bloomberg, Company Reports, Analyst Estimate



Source: Thomson Reuters

(Values in $ millions)	2016	2017E	2018F
Revenues	27,638	40,653	57,378
Revenue Growth	54.2%	47.1%	41.1%
EBITDA	14,769	23,228	29,679
EBITDA Margin (%)	53.4%	57.1%	51.7%
Net Profit	10,217	15,934	19,667
ROE	17.3%	21.4%	21.2%
EPS ($)	3.49	5.39	6.77
EV/EBITDA	20.53	20.28	18.64
P/B	5.62	6.90	6.84
P/S	11.92	12.61	12.1
P/E	32.97	28.65	30.2

Source: Company Reports, Analyst Estimate

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Valuation Summary

In order to derive a share price target for FB, we conducted a **DCF valuation** based on the WACC approach. Thereby we forecasted the revenue for each core product based on its key value drivers. Together with the estimation of the cost drivers and the balance sheet changes we projected the unlevered free cash flows. Our detailed cash flow projection period lasts until FY24, after which we assume a transition phase until the **perpetual growth rate of 3%** is reached in FY30. Moreover, we estimate a single **WACC of 8.52%** assuming a 100% equity financing throughout all years. As a result, we obtain a **share price target of $246** for year-end 2018, corresponding to a 12-month return of 34.8%.

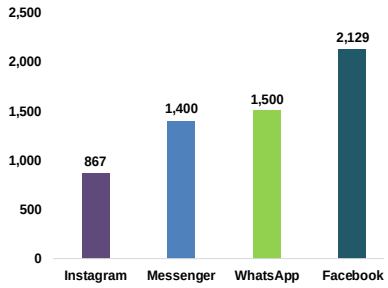
Company Overview

Company Description

Facebook, Inc. (FB) was founded in July 2004 in Menlo Park, California, USA and is today the largest social network in the world, with over 2bn monthly active users (as of January 2018). Its tools enable people to connect, trade, share their opinions, ideas, photos and videos or communicate with each other through mobile devices and PCs. The company's core products include: **1) Facebook**, offering various ways for users and businesses to engage with each other, also includes the News Feed, which displays an algorithmically-ranked series of stories and advertisements individualized for each person. **2) Messenger**, an instant messaging application allowing to communicate with other people, groups, and businesses across various platforms and devices. **3) WhatsApp**, the most used instant messenger in the world. **4) Instagram**, an application which enables its users to edit photos or videos with customized effects and to share them with followers or send them directly to friends. **5) Oculus**, the company's virtual reality branch produces high-end VR technology and content, mainly for gaming purposes.

Initially, only a FB desktop version was available and further FB products features were developed later internally (Facebook Mobile, Messenger). In 2012 Instagram and in 2014 WhatsApp and Oculus were acquired externally, complementing the company's current product portfolio. The company operates worldwide and divides its operations into four geographic regions: US & Canada, Europe[1], Asia-Pacific and Rest of the World[2].

Figure 1: *Monthly active users per product, as of Q4 2017*

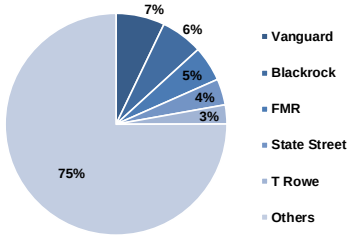


Source: *Company Reports*

[1] Including Russia and Turkey
[2] Including Africa, Middle East and Latin America

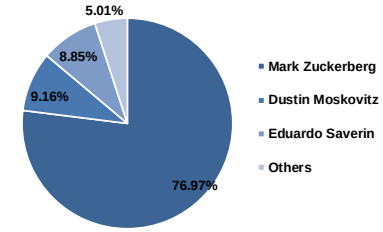
Shareholder Structure

Figure 2: *Shareholder Structure Class A*



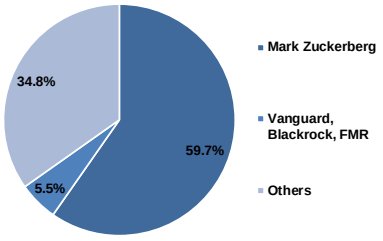
Source: *Company Reports*

Figure 3: *Shareholder Structure Class B*



Source: *Company Reports*

Figure 4: *Total Voting Power*



Source: *Company Reports*

Like many other internet firms[3] FB also uses a **dual class share structure**, which was implemented in 2009, mainly to ensure that early investors and founders keep control of the company. Thereby Class-A shares represent the publicly traded ones, entitling common shareholders to one vote per share. Class-B shares, on the other hand, are so called "super-voting shares", with multiple voting power entitling its common shareholders to ten votes per share. As of 29 January 2018, FB had 4.7 times more Class-A shares (2,395m) than Class-B shares (509m) outstanding. Regarding the shareholder structure of Class-A shares, there is a significant dispersion of ownership. The top five shareholders are all major US asset managers consisting of Vanguard, Blackrock, Fidelity, State Street, T. Rowe Price, which own 7.1%, 6.1%, 5.1%, 3.8% and 2.8% respectively. Other shareholders do not own a significant share, i.e. have no holdings above 2%. Mark Zuckerberg holds 0.36% of Class-A shares. In total **institutionals own 74.0%, retail investors 23.9% and insiders 2.1%**. As opposed to Class-A, the super voting Class-B shares show a very concentrated ownership structure, being almost exclusively held by its initial co-founders Mark Zuckerberg, Dustin Moskovitz and Eduardo Saverin, who own 77.0%, 9.2% and 8.9% respectively. The remainder (5.0%) is mostly owned by other early investors and executives. Through an agreement with Moskovitz, Zuckerberg holds an irrevocable proxy over Moskovitz's owned Class-B shares, meaning he has in fact control over 86.1% of the voting power of Class-B shares. While only owning 0.36% of the floating Class-A shares, **the dual class structure (Class-A&B) entitles Zuckerberg to 59.7% of all voting rights**, allowing him to control all major decisions of FB. In case Zuckerberg leaves FB, his Class-B shares will be converted into Class-A shares, thus reducing his voting power substantially and subsequently diminish his corporate control over FB. The company could then elect his successor, as new CEO, freely.

Business Model under Pressure

Data – the oil of the 21st century. Where does FB gets its data from?

In essence FB's business model is to build free of charge social media platforms, which people voluntarily use, in exchange for allowing FB to collect their data and to target them with ads. FB collects data from three different sources. The primary data source is **first-party data owned by FB**; it is comprised of information the company gathers through its proprietary network. In practice, FB uses 98 data points about a user for targeted advertising, derived from information that users voluntarily provide to FB e.g., birthday, gender, language,

[3] Amongst others Alphabet, Snapchat and Zynga

education level, field of study, etc. Additionally, also the user's on-site activity is tracked, collecting data like clicked ads, pages liked, current location, phone brand or type of browser. However, what most users do not know, is that **FB also tracks their web activity outside of the platform**. While being logged onto FB, the network can see virtually every other website a user is visiting. What's more, **while being logged off or not even having a FB account, it is still able to gain personal data** from every website or app that uses one of the following four FB services: *FB social plugins*, i.e. having a like, share or FB login button; *FB Analytics* which gives websites and apps data about how they are used and by whom; *FB Ads* which enables other websites and apps to show ads from FB advertisers, this is also known as the **FB Audience Network**; and *Ads measurement* which allows advertisers to get KPIs about how many people are responding to their ads. The data gained through these channels presents **first-party data owned by FB**.

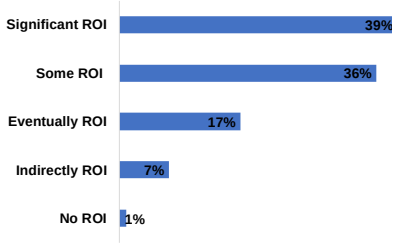
Figure 5: *FB social plugins*

Source: *Company Reports*

The second data source is **first-party data gathered by companies**, which advertise on FB. The social network offers these companies to share their own customer data to improve ad targeting. For example, the retailer Walmart might have first-party data of customers in-store purchase history, which Walmart can upload to FB. FB then uses Walmart's and their own data to display ads to a targeted audience on one of FB's channels.

Through a third source, information from **third party providers**, like the data brokers Experian and Acxiom, is collected. These data brokers gather information about people's health, demographics, political views, consumer behavior and credit ratings[4] through sources including government records, surveys, loyalty card purchase histories and magazine subscriptions.

Figure 6: *Social Media Marketing generates…? (Survey among marketing executives worldwide)*



Source: *Salesforce*

Eventually, FB then bundles the information from all the previously mentioned sources to create **a comprehensive consumer profiles, based on people's behavior on FB, on the web as well as in the offline world**. This unique collection of data is the foundation for targeted ads and fundamental to the company's competitive advantage. It is crucial to FB's ability to generate superior ROIs for its advertisers. Should FB lose the right to access or use such data as they now do, e.g. through increased regulation, the company's ROI is likely to decline.

The introduction of GDPR

In the upcoming months and years, the industry will face stricter data regulation rules, with Europe being ahead of other regions, bringing its "General Data Protection Regulation" (**GDPR**) already on 25 May 2018 into effect, which **is considered as the most far-reaching set of rules for online data privacy in**

[4] NZZ, "Wer sind die Datenhändler, von denen Facebook sich zurückzieht?", 29/03/2018

20 years[5]. Other regions are likely to follow the EU by introducing similar laws, since Europe has been traditionally the global pioneer in data protection. Therefore, the GDPR might serve as a blueprint for other countries' lawmakers and by analyzing its impact on FB, we will not only be able to draw conclusions for Europe, but also see what in other regions is yet to come. The fact that US users are demanding similar standards to those in the EU and Zuckerberg's statement "to make all controls and settings the same everywhere, not just in Europe", suggests that this is a plausible scenario[6]. In brief, the idea of GDPR is to give citizens back control over their personal data, to restore consumer trust and thus foster growth in the digital economy. The regulation will apply to all firms processing personal data of EU citizens, regardless of the company's location. What does the regulation include?

- **Consent:** Users must give their "unambiguous" consent to collect personal data and it must be as easy for consumers to withdraw consent as it is to give it. Furthermore, illegible Terms & Conditions full of legalese will no longer be tolerated. Firms will need to post them in clear and easy language concerning what information it is collecting for what specific purpose.

- **Data Access & Erasure:** Users have the right to access all data held about them and how it is used, free of charge within a month of request. Second, the user owns the data, i.e. they own the rights to trade it, which is happening already[7]. Furthermore, users can force companies to delete all information about them, that was used for marketing purposes, illegally gained, e.g. without consent, or serves no current purpose.

- **Compliance & Penalties:** Firms with more than 250 employees are required to hire a data protection officer, who is responsible to supervise company's data processing practice and to notify customers within 72 hours in case of a data breach. Penalties for neglecting or violating these laws can amount to up to 4% of global annual revenue (FB revenue FY17: $40.6bn, max. possible fine: $1.6bn).

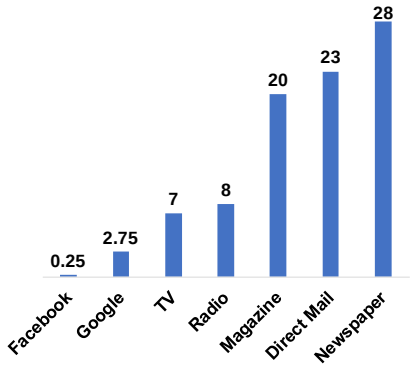
Impact on the Business Model – Tame the data collector

In the aftermath of the Cambridge Analytica data breach, FB has announced to **abandon the third-party data source**, thus advertisers will not be able to access third-party data for targeted ads anymore. Although, generally a decrease in data availability, is detrimental for every data-driven company, we see this specific step as a strategically smart move. By cutting out the middlemen, i.e. the

[5] Source: eugdpr.org
[6] Open Letter to Zuckerberg by the Transatlantic Consumer Dialogue Organization
[7] Bloomberg: Example of Zara exchanging gift vouchers for people's shopping history at J. Crew.

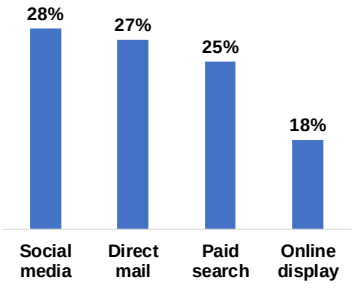
data brokers, **more ad dollars might flow directly to FB** instead of giving a share of the revenue to third party data providers for their data[8]. Additionally, by making it harder to reach outside data sources for advertisers, FB has more control in the ad-buying process and will be able to keep some customer insights hidden from marketers. Amongst advertisers this concept is known as **walled garden** – it describes "a closed ecosystem in which all the operations are controlled by the ecosystem operator"[9]. Due to heavy criticism by marketers of this modus operandi, the company suggested in February 2018 to deliver some of its ad data to a neutral third-party. However, this was before the data scandal in March 2018 and the resulting change in the political environment. Now the opening-up movement has come to an end, and FB will rather increase the walls around its garden to restrict outside data access instead of further opening its gates. As a result, **third-party dependency on FB and Google may further increase**. The two internet ad giants account together already for 84%[10] of the global digital advertising market, excluding China. What's more, **first-party data owned by other companies** is affected by GDPR. Meaning, companies that used to upload their own customer data to FB for advertising purposes might themselves have less customer data available and thus the process to share it with data aggregators like FB could be exacerbated. However, the real threat for FB comes **from the restrictions on first-party data.** The whole business model is based on first-party data. Marketers are shifting ad budgets from traditional channels to FB, because out of the logged behaviors of billions of people **FB is able to show the most relevant ads** for each target group. By being more relevant for the audience, it is also more likely that the ads will convert into a purchase and thus generate better returns for advertisers. This is why FB is such a lucrative advertising tool.

Figure 7: *Average cost to reach 1,000 people on different channels (in $)*



Source: *Sproutsocial*

Figure 8: *Median ROI for selected channels according to US marketers (in %)*



Source: *eMarketer*

The company is not only using this skill on its own platforms, but also applies it on its advertising network outside, known as the *FB Audience Network* (FAN). According to AdGuard **out of the 2,556 most popular apps on the Google Play store, 41 percent are part of FB's Audience Network**[11], meaning FB can run ads on 41 out of 100 apps. This allows advertisers to extend their FB ad campaign outside of FB, while using the same targeting information as on FB. Thereby web publishers and app developers benefit by receiving money for showing FB's targeted ads, marketers by having more available ad units and lower costs and FB benefits from a further channel for placing ads instead of congesting their own platforms. We believe the FAN has been FB's key resource

[8] The market supports this view: Acxiom's (a data broker) stock fell 19% upon FB's announcement
[9] Medium Corp, "What is a Walled Garden? And why it is the strategy of Google, Facebook and Amazon Ads platform?", 03/11/2017
[10] FT, "Google and Facebook dominance forecast to rise", 04/12/2017
[11] AdGuard, "Facebook tracking is present in 41% of the most popular Android apps", 25/03/2018

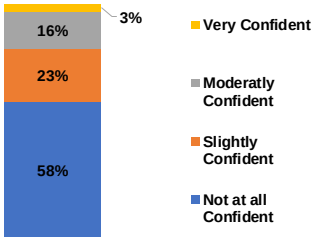
to maintain high ad revenue growth rates while its user growth has been decelerating, since 2014.

The problem of this system is that FB has collected this enormous amount of data on users **without any explicit consent**. With the new regulation **consent is required for on and offsite data collection**. If FB did not originally receive an explicit consent from its users to collect the information, then they are required to ask again and if consumers withdraw their consent, FB could be required to **erase databases full of information**[12]. While we do acknowledge a huge risk potential here if FB's trove of data diminishes, we do not expect that **the majority of users to opt-out of this data tracking practice completely**.

91% of consumers accept T&C without reading them
(Source: Deloitte)

Firstly, because privacy rules and data protection are something abstract and complex, that most people do not fully understand, users generally prefer to give consent to use the service as fast as possible instead of thoroughly going through the Terms & Conditions (T&C). Secondly, **FB will do everything to make it as hard as possible for users to opt-out**, e.g. there are pre-ticked boxes, so users opt-in for all kinds of tracking by default and to opt-out the users are shown long texts, which makes it look like tedious hard work to withdraw consent[13]. Thirdly, **an overall opt-out possibility for users for targeted advertising does not even exist**. Users can only opt-out of being targeted with ads based on data coming from the company's outside network[14]. But there is no way to stop FB from using data gathered through their proprietary network for ad purposes. Asked for a possible violation of GDPR, FB's deputy chief privacy officer, Rob Sherman's only explained: "People can choose to not be on FB if they want." Fourthly, the company even tries to make users opt-in for new features, e.g. users can give consent for facial recognition in Europe now, which has not been available before. Thus, it makes the opt-out option rather look like a possibility to personalize the product than to increase privacy protection.

Figure 9: *How confident are you that FB protects your privacy and data? (Global survey among users)*

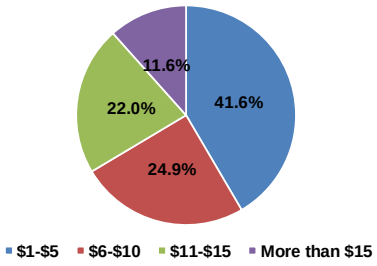


Source: *Bloomberg Intelligence*

Previously, in an interview Sheryl Sandberg underlined that user consent is essential for running the business: "Our service depends on your data, (so) we don't have an opt-out at the highest level. That would be a paid product." This basically means **users can either accept to be targeted at least on FB's platforms or they will not be able to use FB at all**. Therefore, we expect most users to accept FB's T&C, since they do not want to lose access to the product, with only a small minority of users leaving. According to the Q1 FY18 conference call, MAU and DAU numbers are expected to slightly decrease (-5%) in Europe in Q2, due to the GDPR implementation. In our view, **a paid version is not**

[12] Bloomberg, "How Europes GDPR will mean your data belongs to you", 20/03/2018
[13] Techcrunch, "Data Experts on Facebook's GDPR changes", 18/04/2018
[14] Websites or Apps using Facebook Analytics, Facebook Audience network or measurement

Figure 10: *How much would you pay per month for an ads-free version of Facebook?*



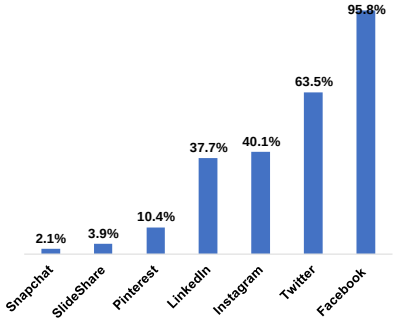
Source: *Recode, Toluna*

Figure 11: *Average CPM across various Online Platforms (in $)*

	CPM
Facebook	8.8
FB Audience Network	3.9
FB Messenger	6.0
Instagram	10.3
LinkedIn	7.1
Twitter	5.2
Google AdWords Search	78.9
Google Display Network	2.8
YouTube	11.0

Source: *AdStage*

Figure 12: *Which Social Media Platforms produces the highest ROI? (Global survey among social media marketers)*



Source: *eMarketer*

compatible for the mass market, not only because there is a widespread mentality for free products but also because FB would need to charge a fee as high as their current ARPU[15] to not lose revenue. In the US this would equate to a monthly fee of $10.20 (est. monthly ARPU FY18), which exceeds the willingness to pay for many users as a recent US-exclusive survey showed: only 33.6% of users would pay more than $10.00[16], the clear majority (66.4%) is not willing to pay such a high amount. Thus, we conclude a paid product is not a viable option soon, particularly given FB's mission of connecting people.

Impact on Financials

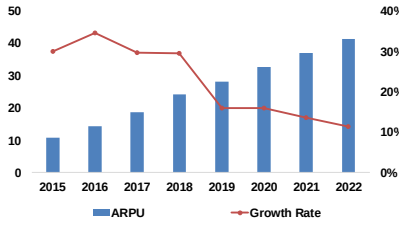
As previously described FB will have fewer data sources available in the future and thus most likely also less data available. How the data availability develops, is mainly depending on the user's behavior, i.e. how many will give consent, as well as how loss-limiting FB can implement the new regulation, i.e. adhere to GDPR without unnecessarily giving up data. In our view, their **data tracking practice is still intact**, and we do not expect an Armageddon for the company's business model, unlike some media experts[17]. Certainly, having fewer data points available might lead to less precise ad targeting results, which could lead to a lower ROI for advertisers. However, this does not necessarily imply lower ad prices and thus lower revenue, as David Wehner, FB's CFO, explained "**the crux in winning budgets is our relative performance versus other opportunities presented to marketers**". Since all data-driven advertising firms will be adversely affected by regulation the **returns of Google, LinkedIn, Twitter and Snapchat ads are all likely to go down as well**. The question will be, how FB's ad returns compare to its peers in the future and what the effect on ad prices will be. It is even possible, that **the worse data availability leads to higher ad prices**, as overall less data will be available and thus the data a company owns will consequently be more valuable, due to a lower total data supply in the market. Overall our assumption is that the **worsened data availability does not change the competitive situation** in the digital ad industry, since all industry players are affected. As FB pointed out in a recent blog post, their data tracking practice is in line with the industry standard:

"*Many companies offer these types of services and, like Facebook, they also get information from the apps and sites that use them. Twitter, Pinterest and LinkedIn all have similar Like and Share buttons to help people share things on their services. Google has a popular analytics service. And Amazon, Google and Twitter all offer login features. These companies — and many others — also offer*

[15] ARPU: Average Revenue per User
[16] Recode, "How much would you pay for Facebook without ads?", 11/04/2018
[17] CNBC, "Economic historian Niall Ferguson: It's hard to see how Facebook's business model remains intact", 22/03/2018

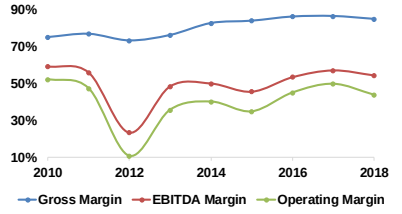
advertising services. In fact, most websites and apps send the same information to multiple companies each time you visit them."

Figure 13: *Average ARPU, 2015-2022 (in $)*



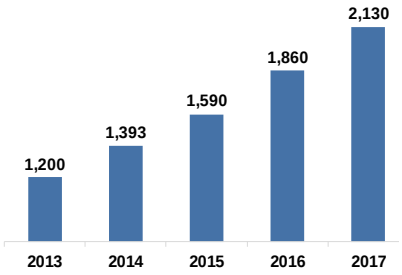
Source: *Company Reports, Analyst Estimates*

Figure 14: *Margin Overview, 2010 - 2018 (in %)*



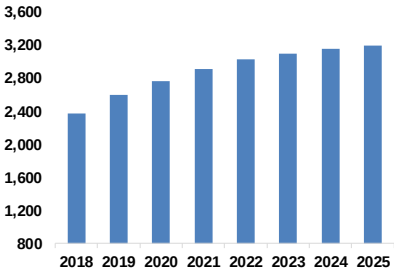
Source: *Company Reports, Analyst Estimates*

Figure 13: *Historical total user numbers, 2013 - 2017 (in million)*



Source: *Company Reports*

Figure 14: *Future total user numbers, 2018 - 2025 (in million)*



Source: *Company Reports, Analyst Estimates*

Other channels like out-of-home, radio, print or TV ads might slightly benefit from this situation, however we do not see material changes in advertisers or consumer behavior trends. TV viewer, radio listener and print sales number are still in a secular downtrend and marketers are unlikely to shift back massive amounts of ad budgets to formats that are constantly losing reach. As a result, we do not expect a substantial user loss or decline in ARPU (average revenue per user), **we estimate top-line growth to remain robust**, i.e. an average annual revenue growth of 30% in the upcoming three years. Regarding expenses, **we expect increased spending for compliance purposes**, including hiring more people to oversee data protection and collection, implementing new privacy protection tools as well as structuring business processes newly. We believe this will **bring down the operating margin to 43.7% in FY18 (FY17 49.7%)**, and **to 42.5% in the long run**, since many compliance jobs are here to stay. The joker in this process are **fines**. With the Cambridge Analytica data breach FB most likely violated a 2011 agreement with the Federal Trade Commission, where FB agreed to protect user data from unauthorized access[18]. According to the agreement, the fines may be up to a maximum of $40,000 per violation, i.e. in theory for the 50 million violations of US citizens the FTC could impose a penalty of $2 trillion. We do not believe, this is a possible scenario, since this would not punish the company but kill it. Instead we expect a fine high enough to send a signal to other data-driven companies to take privacy regulations seriously. **In our model we incorporated a fine of $1 billion**. Besides that, we do not assume any meaningful legal fines in our model, even though this assumption might be challenged in the future, especially against the background of the GDPR introduction[19].

Core Product Analysis

Facebook

Initially, FB started as a web-based version of the printed yearbooks of Harvard University, by offering fellow students to create an online profile. Nowadays, this feature still exists and is known as the **Profile**, giving users the possibility to share ideas, interests, photos, videos, check-ins and personal information like current city, relationship status or date of birth. In 2006 it was extended by the **News Feed**, which displays a regularly updated and algorithmically-ranked series of stories from a user's friends, followed pages, joined groups or events, as well as ads individualized for each user Other core features are: **Groups** which gives

[18] CNBC, "Privacy advocate: Facebook could face huge fines over its data use, in theory trillions of dollars", 10/04/2018
[19] TechCrunch, "Data experts on Facebook's GDPR changes: Expect lawsuits", 18/04/2018

people a platform to share information about a specific common interest and is also used as a marketplace (MAUs: >1bn); **Events** which allows people to organize gatherings, ranging from small private dinners to massive public concerts (MAUs: >550m). **Games** which enables users to find and play games, that are developed by external parties, comparable to Google's Playstore; **Pages** which lets artists, public figures, businesses and non-profit organizations create a presence on FB and interact with users, fans or customers.

Features attacking other sectors

Apart from FB's traditional social media function the firm has also started to create its **own versions of several popular activities on the web** (e-commerce, e-recruiting, online dating, online video, enterprise communications). Thus, the platform can increase the users' time spent on FB as well as absorb potential profits either through ads or subscription-based revenue models.

Attack on traditional eCommerce players

In 2016 **Marketplace** was launched**,** which presents a listing tool on FB, comparable to platforms like eBay, Amazon Marketplace or OLX, where users can buy and sell goods in the area near their indicated location. The goods offered can be new or used and can range from clothes to TVs and cars or even real estate. The feature has so far already **over 800m users** (approx. 40% of MAUs) in 70 countries. With such an enormous customer potential the feature presents an attractive new distribution channel for sellers (private people and corporations). For FB this could present a new revenue stream by selling ads within marketplace, e.g. guaranteeing a seller a top spot after a search (similar to a Google revenue model within FB). Since above all expensive goods like cars or motorcycles are the most sought-after products, we believe particularly commercial sellers are likely willing to pay for ads, if this would help them to sell one of their objects. Alternatively, FB could set up a similar model to those to eBay and charge a listing or transaction fee for every conducted purchase.

Facebook Marketplace

Augmented reality as the new normal

In 2017 **Stories** was rolled out, which allows people to create their own short user-generated photo or video collection and combine them with augmented reality features[20], giving their followers an impression of their daily activities. Even though this feature is not a primary revenue driver for FB, we see the development of this tool as important from a managerial perspective, since it proved that **FB is not reluctant to copy from its competitors**, if they are moving ahead of FB in a certain field. In this case FB's feature is considered as a rip-off of Snapchat's stories by many experts. We expect FB will also not hesitate in the future to mirror competitors' functions again if needed, especially given FB's financial and technological capabilities to do so. Aside from the strategic

[20] Moreover, users can apply filters, lenses as well as add visual geolocation tags to their content

importance, the functionality can be also seen as a reaction of FB to a change in user behavior, who increasingly move away from text status updates to use photo and video sharing as primary posting option.

Shaping a new trend of social recruiting

The 2018 rolled-out **Jobs** function allows companies to inform users about their current job opportunities on their FB Business Page, on Marketplace or in the Newsfeed. Additionally, also users can search actively for jobs in an aggregated list, which presents all job offerings in their surrounding area. In case of an application, **the whole recruiting process runs over FB and neither the company nor the applicant need to leave FB**, meaning firms do not need to provide their own HR recruiting platform. With this tool FB is targeting primarily small businesses with low recruiting budgets, that often have difficulties finding the right people, especially for low-skilled jobs that are not highly paid, e.g. in the food service or retail industry. As FB has already the users and businesses on their platform and provides numerous possibilities for firms to engage with users, offering a recruiting tool seems like a logical step. For FB this could generate revenue, e.g. by letting firms promote for their job openings on FB in order to increase their reach.

The **Dating** feature was just launched in May 2018[21] and will give users the chance to opt in to create a dating profile on FB. Users will be matched based on their dating preferences, things in common, and mutual friends with users they are not friends with. And, since FB has more information about its users than most other apps, it might provide more relevant matches. FB's value proposition is the same as for ads. Given the fact that many dating apps require users to have a FB account to login, FB's move seems very sensible. Time will show how users adapt and if they are willing to mix their social media app with a dating tool. Regarding monetization, FB could benefit indirectly in two ways: First FB will receive a lot of valuable new data about its users and second users will spend more time on FB, because the average time spent on dating apps is 85 minutes[22] on average per day compared to only 41 minutes[23] on FB. Thus, FB could not only get further customer insights but has also more space to display ads.

Texting is dead video is the future

Watch is a **video on demand service** that has been rolled out in the US in 2017 and will be expanded internationally soon. The content shown on Watch ranges from reality to comedy to news and live sports, e.g. the major baseball and soccer league. According to the Q4 conference call Watch is "**heavily focused on the social aspects of video viewing**", containing a "dedicated place for people to watch and comment". In this way it makes sense to focus on content

[21] Match Group Stock Price fell 20% upon Facebook's announcement to launch a dating tool
[22] Independent, "Millennials spend an astonishing 10 hours a week on dating apps", 23/01/2018
[23] Source: FB Q4 FY17 Conference Call

that facilitates social engagement, e.g. discussing a debatable penalty decision in a live football match with other viewers. Thereby FB's positioning also differentiates from Netflix and YouTube, which are more tailored towards passive consumption and not on viewers interaction. Also, as part of Watch the **Show Page** feature is introduced, which serves for the show-makers as a platform to present their content to a wide audience and to engage with their viewers. Watch will be monetized through ads of which **45% of ad revenue is allocated to FB, and 55% to its content-producing partners**. With its extensive knowledge about its users, FB can leverage this data to proactively suggest new content to users. Moreover, new data is generated through the user's video viewing history, similarly to YouTube. This data pile could enable FB to target an audience more precisely than traditional TV stations. Given the high adaptation - 40% of US users are already on Watch on a weekly basis[24] - and massive potential to scale, we expect this feature to become the next key revenue driver, comparable to launch of the News Feed. The importance FB attaches to this feature can be also seen in the increased CAPEX spending[25] in 2018 for content acquisition.

Workplace is a cloud-based enterprise software, mainly offering company internal communication services but also file sharing, bots and compliance and governance tools, comparable to a FB version for company purposes. Currently, the feature charges $3 monthly per user and has 30,000 businesses on its platform, including large-caps like Walmart. FB also offers a free version for non-profit organizations.

Based on the market size and competitors' financials we calculated a potential revenue for each feature. We arrive at a revenue potential for **Marketplace of $9bn, Jobs $1.9bn, Dating $2.2bn, Watch $6.8bn and Workplace $1.4bn.** In our view, the biggest risk is that many users could be reluctant to use one platform for all services, since it also means all data about their daily life is stored at one company. Note: The detailed calculations and assumptions can be found in the appendix. The CAGR refers to the respective global market.

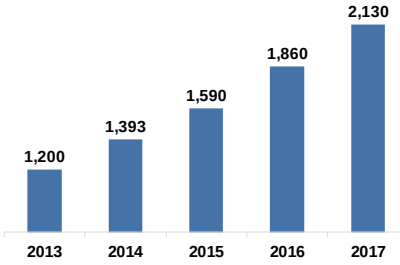
Figure 15: *New product features*

Feature	Sector	Key Players	Global Market Size (in $bn, 2017)	Est. 3y CAGR (in %, 17-20)	MAUs Potential (in m)	Revenue Potential (in $bn, 2018)
Marketplace	eCommerce (focus on C2C)	Alibaba, eBay, Amazon, JD, Etsy, Craiglist	4,058	12%	400	9.00
Jobs	eRecruitment	LinkedIn, Indeed, Careerbuilder, Monster, Stepstone, Glassdoor	32	7%	100	1.87
Dating	Online Dating	Match Group, Bumble, Badoo	5	5%	200	2.16
Watch	Online Video	Netflix, Amazon (Prime & Twitch), Hulu, YouTube	70	16%	-	6.84
Workplace	Enterprise Social Network	IBM, Salesforce, Slack, Microsoft	3	19%	0.15	1.35

Source: *Company Reports, Alphabet Reports, Etsy Reports, eBay Reports, eMarketer, Statista, Grand View Research, OrbisResearch, Forbes*

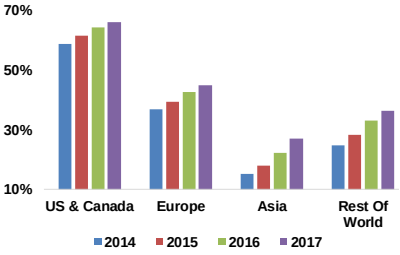
[24] Variety, "Facebook Watch a Hit? Study Finds 40% of Users Tune In to Video Weekly", 19/01/2018
[25] CAPEX FY17: $6.3bn FY18: $14bn

Figure 16: *FB MAUs (in million), 2013-2017*



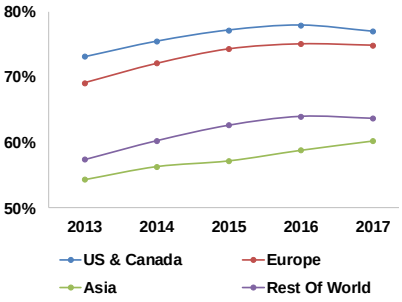
Source: *Company Reports*

Figure 17: *FB MAU population penetration rate 2014-2017*



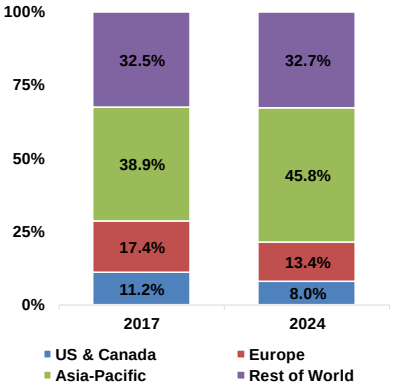
Source: *Company Reports*

Figure 18: *User engagement rates (DAU/MAU), 2014-2017*



Source: *Company Reports*

Figure 19: *FB user breakdown, 2017 and 2024*



Source: *Company Reports, Analyst estimates*

User Development

Since its inception the company has been able to persistently increase its user base at double-digit growth rates. **Between 2013 and 2017, the monthly active users (MAUs) grew with a CAGR of 15.43% from 1.2 billion to 2.1 billion MAUs**. Most of this growth has been coming from Asia-Pacific[26] and Rest of World, which grew on average, 23% and 17%, respectively, while Europe and US & Canada were only growing with 7% and 4%, showing that these regions have already reached a mature stage. This can be also seen with regard to FBs population penetration rate[27], with 66% in US & Canada and 45% in Europa a substantial part of each region's population is already on FB, whereas in Rest of World 36% and in Asia-Pacific only 27% use FB. One reason for this divergence is, that the regions with a lower FB user share also have lower internet penetration rates. In 2017, the internet penetration rates were 88% for US & Canada, 74% Europe, 49% Asia-Pacific and 47% Rest of World, consequently with less people having internet access also less people will use FB. The second consequence is, that due to the low base effect, the internet penetration will grow faster in these regions, giving FB room to increase its user base as well. As of 2017, the user base breaks down into 38.9% of MAUs from Asia-Pacific, 32.5% from Rest of World, 17.4% from Europe and 11.2% from US & Canada.

To measure user engagement, FB calculates the ratio of DAUs (Daily Active Users) with MAUs, which shows how many of the monthly users visit the platform on a daily basis. Thereby the same situation as for the other metrics becomes apparent: US & Canada (77.0%) and Europe (74.9%) as mature markets show significantly higher engagement ratios than Asia-Pacific (60.3%) and Rest of World (63.7%). **A turning point for user engagement might have been reached in 2016**. Previously, the metric has been growing consistently across all regions for years, however since 2016 three out of four regions show a slight decline in engagement rates. Even though the ratios are still at a relatively high and stable level, a continuation of the decline could indicate a decreasing user attraction to the product.

User Forecast: Based on FB's population penetration, change rate of population penetration, internet penetration and historical user growth we have determined MAU numbers for each region, **excluding China**, since FB is banned there. We believe **North America** is already at a mature stage, with currently 65.9% of total population being active on FB. In Q4 FY17 user numbers declined for the first time slightly, however they recovered again in Q1 FY18. We see this as a sign that user **growth is about to slow down significantly**, thus we expect MAUs to

[26] Excluding China due to FB's ban

[27] i.e. how many of a region's inhabitants have a FB account they visit monthly in percent

Figure 20: *US & Canada, MAUs (in million) and population penetration rate (%)*

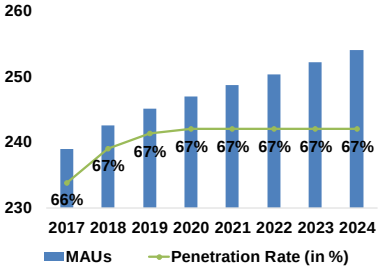


Figure 22: *Europe, MAUs and population penetration rate*

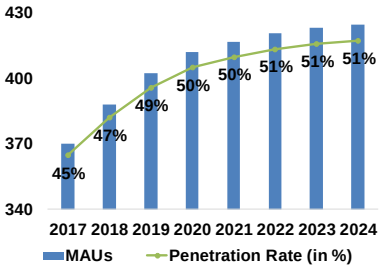


Figure 24: *Asia-Pacifc, MAUs and population penetration rate*

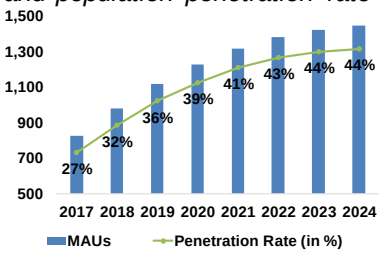


Figure 25: *Rest of World, MAUs and population penetration rate*

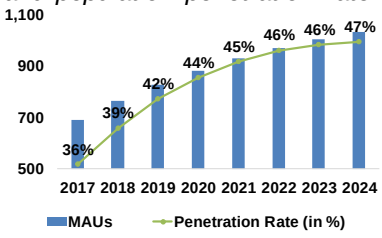
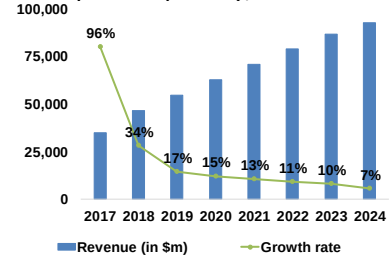


Figure 27: *FB Core Revenue development (in $m), 2017-2024*



Source: *Company Reports*

grow at the same rate as the total population from 2020 on, leading to 254 million MAUs in 2024. In our view, user numbers in **Europe** will continue to grow faster than the total population and reach 425 million MAUs and a penetration rate of 51% in 2024. We expect a lower penetration than in North America, given the higher median age of the population and lower adaptation to digital media in Europe. For **Asia-Pacific** we estimate the biggest jump in user numbers, from 828 million in 2017 to 1,448 million in 2024. Main drivers are the currently relatively low population penetration of 26.9%, the low level of internet access (49%) and a rapidly growing population. For the **Rest of World,** the narrative is the same as for Asia-Pacific. Expected numbers are 1,033 million MAUs and a population penetration rate of 46.7%. Eventually, when we aggregate the numbers, we arrive at **3,159 million MAUs worldwide in 2024**, which equates to a **population penetration rate of 43.1%, an internet penetration rate of 93%** and a 7y-CAGR of 5.8% (CAGR '13-'17: 15.4%). We see most growth potential in Asia-Pacific and Rest of World not only until 2024, but also from that point on, due to favorable demographic trends and a low coverage of internet and FB.

Figure 23: *Facebook user forecast, 2017-2024*

World ex China	2017	2018	2019	2020	2021	2022	2023	2024
MAUs (in million)	**2,129**	**2,377**	**2,597**	**2,770**	**2,914**	**3,027**	**3,103**	**3,159**
Population (in million)	6,162	6,236	6,311	6,386	6,457	6,528	6,600	6,673
Population Penetration Rate (%)	34.6%	37.2%	39.0%	40.5%	41.5%	42.0%	42.6%	43.1%
Internet Penetration Rate (%)	79.2%	84.0%	87.9%	90.6%	92.8%	92.9%	92.9%	93.0%

Sources: Worldbank, Statista, eMarketer, UNICEF, US Census Bureau, IMF, Company Reports, Analyst Estimates

Revenue development: In our model we aggregated the revenue of Facebook and Messenger, under the item **"Facebook Core"**, because first FB does not provide a detailed revenue split and second for using Messenger having a FB account is a requirement, thus an additional breakdown only provides limited further value. Our ARPU and MAUs estimates lead to an **expected revenue for FB Core of 93.0$bn in FY24**, which equates to an **average growth rate of 15%.**

Figure 26: *FB Core revenue and ARPU development, 2017-2024*

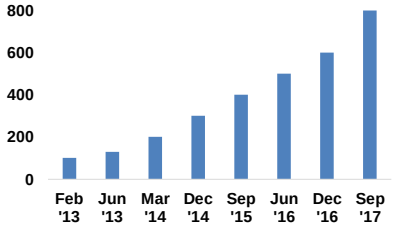
Facebook Core	2017	2018	2019	2020	2021	2022	2023	2024
Average ARPU (in $)	16.4	19.7	21.2	22.7	24.4	26.2	28.0	29.4
Revenue (in $m)	34,955	46,795	54,951	63,009	71,168	79,263	86,972	93,023

- **Instagram**

The **mobile photo and video-sharing application** Instagram was acquired by FB in April 2012 for approximately 1$bn in a combination of cash and stock. It enables users to take photos, make videos, apply filters, and share them on the social network either by sending a private message to somebody, by posting them on their profile or on the stories feature as well as having video chats. In order to see the content, users have to follow others, which can include friends,

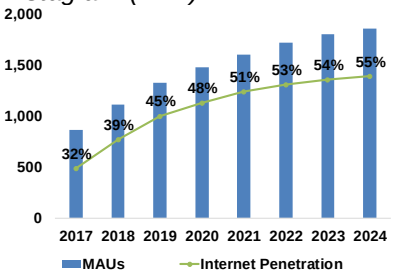
brands, celebrities, organizations, thematic pages, etc. It also offers **business accounts**, which lets brands track statistical data and helps them to get detailed information about the characteristics of their followers as well as a hashtag feature, that allows brands to see which topic is currently trending. Another benefit for marketers is the natural implementation of ads into the user interface of the platform. Compared to FB, ads look very similar to original content on Instagram, giving the users to a lesser extent the feeling of being exposed to targeted ads[28]. Currently, there are **over 2 million advertisers and over 25 billion business accounts** on Instagram. With **200 million users visiting a business profile** every day, this is a powerful marketing tool for brands and an important basis for Instagram's revenue generation.

Figure 28: *Historical User Development Instagram (in m)*



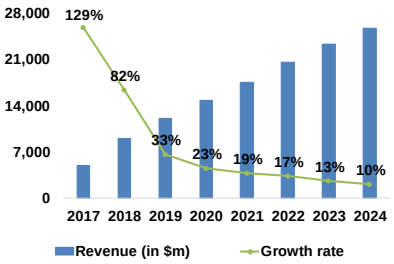
Source: *Company Reports*

Figure 29: *User Forecast Instagram (in m)*



Source: *Company Reports, Analyst estimate*

Figure 30: *Instagram Revenue development (in $m), 2017-2024*



Source: *Company Reports, Analyst estimate*

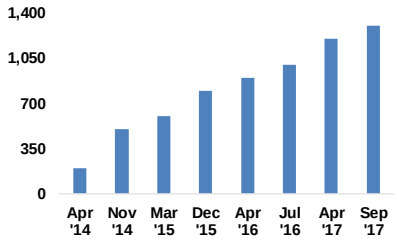
Figure 31: *Instagram revenue and ARPU development, 2017-2024*

Instagram	2017	2018	2019	2020	2021	2022	2023	2024
Average ARPU (in $)	5.8	8.2	9.1	10.0	11.0	12.0	12.9	13.8
Revenue (in $m)	4,987	9,072	12,091	14,813	17,598	20,616	23,306	25,740

In **terms of users** Instagram has been consistently growing from 80m users at the time of the acquisition in **2012 to 867 million MAUs today**, corresponding to a tenfold user increase in five years. We expect this trend to continue and project **1,860 million MAUs in 2024**, equating to a **55% internet penetration rate** and **an average annual growth rate of 11.8%.** Currently, the product has still the lowest user numbers of all of FB's platforms, but in our view, it has the biggest growth potential given its relatively lower user base as well as strong focus on popular features like augmented reality and multimedia sharing. In terms of revenue, we expect double-digits growth rates until 2024 and forecast a **revenue of 25,740$m** and an **ARPU of $13.8 for 2024**.

- **Messenger**

Figure 32: *Historical User Development, Messenger (in m)*



Source: *Company Reports*

Messenger is in its core a **mobile instant messaging app**, enabling users to send messages and exchange photos, videos, stickers, audio, and files, as well as react to other users' messages and interact with bots. It used to be an integrated feature of the FB product until in 2012 a standalone version was released. The core messaging function is complemented by a great variety of other features, e.g. a similar *stories* function like on the other platforms, voice and video calling, an AI tool that instantly translates messages written in other languages, location sharing, playing instant games, requesting a ride by Uber or Lyft[29] and making money transfers to friends or groups. In terms of users, Messenger is with **1,300 billion MAUs today** the second largest messaging app worldwide, corresponding to an internet user penetration of 45.9%.

[28] Mdgadvertising, "How Instagram's Natural Look is Affecting the Look of Ads", 05/11/2015

[29] So far only in U.S. available

Messenger for Businesses

60 million businesses are on Messenger

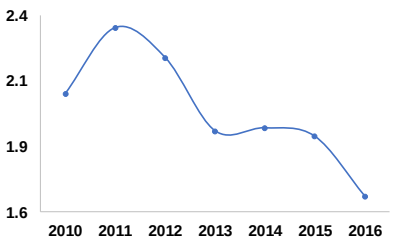
According to the research firm Nielsen, instant messengers are the second most popular mode of communication between customers and businesses. With people exchanging over 8 billion messages[30] with brands monthly via Messenger, FB is ahead of this trend. Firms can leverage their customer engagement with the app in various ways: The 2017 introduced **discover** tab lets users find, brands they have recently interacted with, businesses around them, what is trending, or search for specific topics like news, entertainment or finance. If a user messages a business, it does not need to reply in person but can employ a **chat bot**, which gives an immediate response to users and helps them to find the information they are looking for quickly. For firms this could help to automatize repetitive tedious tasks and reduce expenses for customer support. Currently, there are 300,000 chatbots active on Messenger. Furthermore, the social network offers a **customer chat plugin**[31], which allows customers to talk directly with businesses on their homepages using Messenger. If this feature is successful, we expect many firms not only to provide a phone number and e-mail address on their website but also a button for the Messenger. Additionally, firms can build their own **brand specific augmented reality** experience directly in the Messenger, to market their products and allow instant purchases in the app. Since the app also **allows to integrate payment providers**, the payment for a purchase could be done immediately, without requiring any party to leave the app. Thus, the company would be involved in the whole online shopping process.

- **WhatsApp**

WhatsApp is an **instant messaging service**, that has been founded in 2009 and was acquired by FB in 2014 for 19$bn. The application enables users to send text messages, audio content, pictures, videos, document files, location information as well as to make voice and video calls. Moreover, each user can, similarly to the other platforms, post a story known as "Status". By default, the app runs on mobile devices, but is also accessible from desktop computers. Unlike in the case of Messenger, user accounts are not connected to FB, but are recognized through a mobile phone number instead. Since its inception the app has been able to **replace a large part of the global SMS volume** by providing a cheaper internet-based messaging service compared to the expensive SMS service of mobile phone operators.

With **WhatsApp Business**, a new platform is offered for companies to interact with their customers and to establish a presence on WhatsApp. The application is

Figure 33: *US SMS Volume (in bn)*



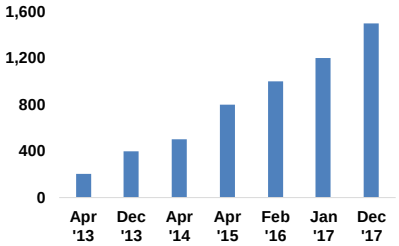
Source: *Statista*

[30] TechCrunch, "Facebook tiptoes into translation within Messenger", 01/05/2018
[31] FB Newsroom, "Introducing Messenger Platform 2.2: New Customer Chat and Improved Engagement Tools", 07/11/2017

WhatsApp Business

primarily targeting SMEs and will be offered for free. Another chargeable version for large enterprises with more advanced tools will be launched later. In brief, the app for SMEs is a simplified version of the FB Page feature and allows businesses to build a verified profile, so users can clearly identify them and find information about the business like address, website, business description or opening hours. Furthermore, a statistical tool to analyze the communication process with the customers will be provided. The **use cases** could be, e.g. "someone placing an order with a local bakery, looking at new styles from a clothing store" or "shopkeepers who use WhatsApp to stay in touch with hundreds of customers from a single smartphone"[32]. Regarding the **monetization** of the product, WhatsApp could build a business search engine with optional **sponsored results** or allow to cold-message people in exchange for a fee. Alternatively, businesses could be only allowed to send messages to users after the users have contacted them before. Thereby WhatsApp could then offer businesses to buy so called **"tap-to-message" ads** to get people to initiate a conversation so the business can follow up with a sponsored message[33].

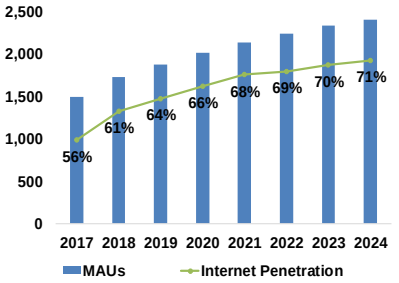
Figure 34: *Historical User Development WhatsApp (in m)*



Source: *Company Reports*

Since 2017 WhatsApp has been testing also a **payment feature** in India[34] allowing people to send or request money from other users, whereby user verification is done via SMS and the actual transaction is conducted by banks. We expect a **global roll-out** for this feature in the upcoming years. Given the high level of penetration of smartphones compared to desktop computers and the fast-growing user base, especially the African and South East Asian markets provide huge potential to build a new revenue stream around this feature.

Figure 35: *User Forecast WhatsApp (in m) and Internet Penetration (%)*



Source: *Company Reports, eMarketer, Analyst estimate*

To forecast user growth, we used the same parameters as for FB (historical user growth, population and internet penetration). We see that in 2017, WhatsApp had 1,500 million users and an internet penetration of 56% (ex China). As globally leading messenger we estimate WhatsApp has the potential to reach an internet penetration level of 71% in 2024, which corresponds to an average annual growth rate of 7% ('14-'17: 40%) and .2.4 billion monthly users worldwide.

Figure 36: *Revenue Forecast WhatsApp (in $m)*

Source: *Company Reports, Analyst estimate*

Revenue Forecast: Since WhatsApp is only started to be slowly monetized this year, our revenue forecast is mostly based on competitors' numbers and not historicals. According to Forbes, Line and WeChat, two leading Asian messengers, generate an ARPU of $9 and $7, respectively. While Line generates almost all its revenue from advertising, WeChat also has a substantial share in payments services with 600 million MAUs using WeChat Pay. From the most recent business roll-out and payment testing we conclude WhatsApp is following

[32] WhatsApp Blog, "Wir entwickeln für Menschen – und jetzt auch Unternehmen", 05/09/2017
[33] TechCrunch, "WhatsApp officially launches its app for businesses in select markets", 18/01/2018
[34] TechCrunch, "WhatsApp has launched person-to-person payments into beta in India", 08/02/2018

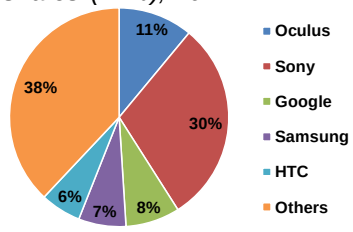
a **similar monetization path like WeChat** around organic ads, payments and e-commerce features. Since WhatsApp's key success factors are its easiness to use and simple user interface, we do not expect FB to immediately flood the app with ads and additional features but rather apply a slow monetization approach. As a result, we project an ARPU of $0.1 and revenue of 118$m in 2018, which gradually increases until $7 and 15,709$m in 2024.

Figure 37: *WhatsApp revenue and ARPU development, 2017-2024*

WhatsApp	2017	2018	2019	2020	2021	2022	2023	2024
ARPU (in $)	0	0.1	1.0	3.0	4.7	5.9	6.0	7.0
Revenue (in $m)	0	118	1,500	5,205	8,844	11,815	12,843	15,709

Oculus

Figure 38: *Global VR market shares (in %), 2017*



Source: *VentureBeat*

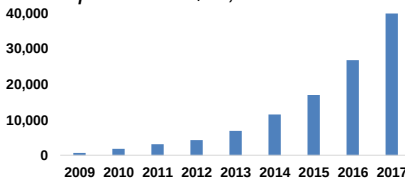
Oculus is FB's **virtual reality** (VR) arm, which is specialized in VR-related software and hardware. The company was acquired by FB in March 2014 for 2.3$bn. Currently, it is selling the three hardware products: Gear VR, which has been developed in collaboration with Samsung and presents the firm's entry-level product (3.65 million units sold[35] in 2017); Go, the firm's first standalone headset which just started to be sold in May 2018; and **Rift**, the company's the high-end flagship, of which only sold 0.85 million headsets were sold. The lower sold units number could be traced back to the relatively higher price and the fact that users need a more powerful PC than most regular ones to use the Rift. Next to the hardware business, the company also produces VR software mainly for gaming purposes. We estimate the revenue share of the software branch to be approximately 10% and hardware to account for around 90% of the revenue[36], given Oculus primary focus on the development of headsets.

In terms of market development, VR is currently still at a very immature stage, future development and thus **highly dependent of the level of user adaptation**. Given the **wide array of VR use cases** e.g. for gaming purposes, in e-commerce or engineering, we believe **VR has the potential to become a mass market**, especially if hardware prices continue to go down. Regarding market players, Sony, Oculus, Google, Samsung and HTC dominate VR, with 30%, 10%, 8%, 7% and 6%[37], respectively, equating to 61% of the total market. The crucial questions for the future will be: **1) which product category will win**, if it is smartphone-based, combined with a high-end computer or a standalone product and **2) for which platform will be the most software products available**. In our view, those two factors will determine how a producer will perform. We see Oculus as

[35] Source: IHS
[36] Source: Bloombert Intelligence
[37] Source: VentureBeat

well positioned in the market, given its very positively reviewed[38] existing products, Rift and Go, which cover all product categories. According to Goldman Sachs, the **global VR market will reach 80$bn in** 2025 with an average annual growth rate of 30.1%. Whereby **hardware products account for 45$bn and software for 35$bn** of the total revenue. We assume Oculus could generate **0.9$bn revenue in software** (3% market share) **and 7.1$bn in hardware** (20% market share) by 2024, **corresponding to 5.6% of FB's total revenue**.

Figure 38: *Advertising revenue development in $m, 2009-2017*



Source: *Company Reports*

Figure 39: *Oculus revenue forecast, 2017-2024*

Oculus	2017	2018	2019	2020	2021	2022	2023	2024
Software VR Market Size	1,700	4,800	9,114	13,429	17,743	22,057	26,371	30,686
Market Share	3%	3%	3%	3%	3%	3%	3%	3%
Software Revenue	**51**	**144**	**273**	**403**	**532**	**662**	**791**	**921**
Hardware VR Market Size	4,700	7,300	12,686	18,071	23,457	28,843	34,229	39,614
Market Share	10%	14%	15%	16%	17%	18%	19%	20%
Hardware Revenue	**470**	**1,022**	**1,903**	**2,891**	**3,988**	**5,048**	**6,161**	**7,131**
Total Revenue	**521**	**1,166**	**2,176**	**3,294**	**4,520**	**5,709**	**6,952**	**8,051**

Figure 40: *Ad Prices (CPM) FB and IG, 2014-2020 (in $)*

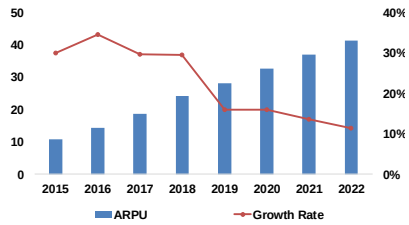
	2014	2015	2016	2017	2018	2019	2020
CPM FB	1.8	4.2	4.4	5.7	6.5	7.2	8.0
CPM IG	0.0	5.3	5.6	7.2	8.2	9.1	10.0

Source: *Company Reports*

Revenue Summary

To get a more comprehensive understanding of how **ad revenue** is composed, we broke it down into its four key value drivers: 1) **User growth**, a higher user number translates into a larger audience that can be targeted with ads. 2) **Ad Prices,** the amount FB charges its marketers on average per ad. 3) **Ad Load**, the number and frequency of ads displayed to the users 4) **Engagement**, representing the time users spend on FB, which is strongly correlated to the ad load, as it can only show more ads if users spend more time on the platform. Eventually, by multiplying ad load and ad prices, we get to the ARPU, whereby ad prices and ad load can also be presented as CPM[39] and impressions delivered. Together with the MAUs, we are then able to project our ad revenue forecast based on the three drivers MAUs, CPM and impressions delivered.

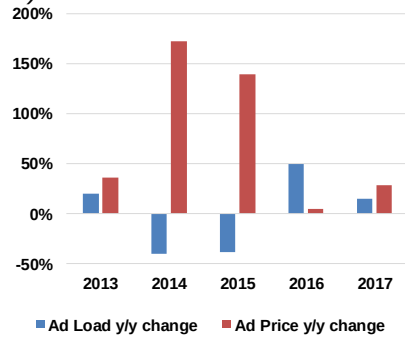
Figure 41: *Average ARPU, 2015-2022 (in $)*



Source: *Company Reports, Analyst Estimate*

Average ARPU: Our ARPU estimation is based on a constant number of delivered impressions per user, as we expect FB will rather charge higher ad prices than harm the user experience with too many ads. This trend was already observable in the past five years, in which **ad load remained mostly flat and ad price growth served as main revenue driver**, with an average growth rate of 77% compared to only 1% for ad load. Regarding the ad prices, we expect a slightly higher CPM for Instagram compared to FB like in past years. For our forecast we estimate both CPMs to grow at the same rate as global internet ad spending, corresponding to an average growth rate of 10.7% for the next five years and a CPM of $10.90 and $13.84 for FB and Instagram, respectively.

Figure 42: *Average Ad load and Ad price changes, 2013-2017 (in %)*



Source: *Company Reports*

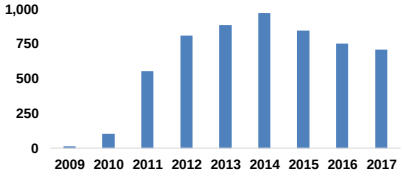
[38] Handelsblatt, "Oculus Go im Test: Virtuelle Welt auf neuem Niveau", 03/05/2018

[39] CPM: Cost per thousand impressions (mille)

Figure 42: *Ad Revenue Summary*

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Ad Revenue	**39,942**	**56,041**	**68,924**	**83,881**	**98,827**	**113,007**	**124,313**	**135,619**	**146,961**	**157,675**	**167,479**	**176,096**	**183,267**	**188,765**
y/y growth	*49%*	*40%*	*23%*	*22%*	*18%*	*14%*	*10%*	*9%*	*8%*	*7%*	*6%*	*5%*	*4%*	*3%*
Facebook Core	**34,955**	**46,795**	**54,951**	**63,009**	**71,168**	**79,263**	**86,972**	**93,023**	**100,802**	**108,151**	**114,875**	**120,786**	**125,705**	**129,476**
Share of ad revenue	*88%*	*84%*	*80%*	*75%*	*72%*	*70%*	*70%*	*69%*	*69%*	*69%*	*69%*	*69%*	*69%*	*69%*
Instagram	**4,987**	**9,072**	**12,091**	**14,813**	**17,598**	**20,616**	**23,306**	**25,740**	**27,892**	**29,926**	**31,786**	**33,422**	**34,783**	**35,826**
Share of ad revenue	*12%*	*16%*	*18%*	*18%*	*18%*	*18%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*	*19%*
WhatsApp	**0**	**173**	**1,882**	**6,059**	**10,061**	**13,128**	**14,034**	**16,857**	**18,267**	**19,598**	**20,817**	**21,888**	**22,779**	**23,463**
Share of ad revenue	*0%*	*0%*	*3%*	*7%*	*10%*	*12%*	*11%*	*12%*	*12%*	*12%*	*12%*	*12%*	*12%*	*12%*
Share Internet Ad Spending	**19%**	**24%**	**26%**	**29%**	**31%**	**32%**	**33%**	**34%**	**35%**	**36%**	**36%**	**36%**	**36%**	**36%**

Figure 43: *Payments and other fees revenue development in $m, 2009-2017*



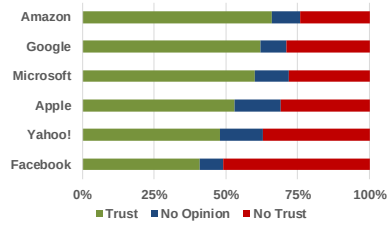
Source: *Company Report*

FB's other revenue stream **Payments and other fees**, which is comprised of fees received from developers using FB's payment infrastructure and of sales from the virtual reality branch **has been constantly decreasing and lost its importance** in the last four years. While in FY13 it still accounted for 11.3% of FB's total revenue, its share has been going down to only 1.7% in FY17. The decline can be traced back to fact that mobile devices replaced the desktop, on which games are played predominantly and thus less in-app purchases are made, translating to a lower payment volume. Furthermore, FB actively reduced displaying games in the News Feed, since it was afraid games spamming could negatively affect the user experience[40]. For the future we expect payments and other fees to revert to the growth path, as soon as Oculus is gaining traction and contributes substantially to the total revenue.

Main Downside Risks

While we are optimistic FB's operations and hence its stock will continue to perform well in the future, our price target is subject to several downside risks, which in case of any occurrence will undermine our forecast.

Figure 44: *Consumer trust regarding major tech firms*



Source: *Statista*

1) Impact of regulatory changes: Due to upcoming regulation (among others GDPR) data availability will decrease, which could lead to a lower ROI of advertisers' ads on FB as well as adversely affect ad prices and thus lower our revenue forecast. Additionally, expenses related to the new data protection rules could prove to be higher than expected. Also, in case of further regulation violations the legal expenses might exceed our assumption. Finally, if users will massively refuse to give consent to be targeted for ads, after having some possibilities to opt-out, then even the whole business model is at risk, however this is only a worst-case scenario in our view.

2) Loss of brand trust: Tax avoidance, fake news, hate speech and election interference are only a few of the issues FB has been recently criticized for. Finally, the recent Cambridge Analytica data breach was the straw that broke the camel's back leading to a massive public outcry, including a #deletefacebook

[40] Techcrunch, "Why Zynga Failed", 06/10/2012

campaign, several public figures deleting their profile as well as a testimony before the senate and congress of the CEO. Subsequently, the brand trust was deteriorating. According to a Reuters survey 51% of its US users do not trust FB with their data, showing to highest mistrust among its tech peers. In case of any further potential wrongdoings in the future, it is likely that brand image would suffer enormously, due to the firm's history.

3) Lower engagement & user growth: The strong user growth and high user engagement metrics are the foundation for the company's success. Any case of a slowdown in those metrics would lead to reverse network effects, making the platform less attractive for advertisers and lower ad revenue. Possible reasons for a user withdrawal could be: a negative perception of FB's usefulness, especially since in 2017 several scientific studies[41] proved that using social media might have adverse effects on human well-being; new competitors' products could be perceived more attractive, e.g. according to eMarketer 2 million young US users (below 24) are leaving FB already in 2018, migrating mainly to Snapchat. Furthermore, some mature markets have reached such high penetration levels, which makes it harder to achieve strong user growth in the future. Our price target is subject to the assumption that FB can continue to grow its MAUs in the forthcoming decade. Any downside deviation would inevitably require us to lower our price target.

4) Loss of advertisers: Since FB generates 98% of its revenue with advertising (as of FY17), a retreat of advertisers would be a substantial threat for the company's business model. One often cited reason for advertisers to leave, is the loss of trust in social media. Brands do not want to be associated with platforms, that allow "extremist material, fake news, child exploitation, political manipulation, racism and sexism", says Unilever's marketing chief Keith Weed, who manages a massive 8€bn annual advertising budget[42] and has threated to pull back from FB, if nothing changes. In the aftermath of the data crisis "a handful of advertisers" took action already and "paused spending".[43] Further incidents are likely to make other firms follow this path. A more material reason for advertisers to leave FB could be a declining ROI on their ads, e.g. due to stricter privacy regulation of user data. Since it is common in the industry for marketers not have long-term commitments[44], they could move to more lucrative alternatives very quickly.

5) Antitrust regulation: During the congressional hearing several of the senators' questions[45] implied that FB has too much power and might be a

[41] Verduyn et Al (2017), Oberst et Al (2017)
[42] CNN Money
[43] Q1 FY2018 conference call
[44] Annual Report FY2017
[45] Sen. Lindsey Graham (Republican, South Carolina), Sen. Dan Sullivan (Republican, Arkansas)

monopoly. There were even open warnings that FB could be broken up if Zuckerberg doesn't take steps to protect users' privacy[46]. Although we do not believe FB is broken up any time soon, it is very likely that large corporate takeovers within the social media sector will be prohibited for the company by the antitrust office in order to prevent an even more dominant position. Given the firm's high M&A activity in past years, the legal limitation of acquiring new competitors, would not only dry up FB's sources for external growth but also give rivals room to grow and to establish their own platforms. A similar development took place already, after in 2013 FB's 3$bn buyout offer for Snapchat was rejected. In the subsequent years Snapchat has grown strongly and is today an innovation leader in instant multimedia messaging, creating features[47] that have been copied by FB. While the takeover was not rejected due to antitrust concerns, but because of personal and economic reasons, it still shows that FB is vulnerable, if it cannot acquire innovative companies and they turn eventually into serious competitors. Therefore, the risk is that legally restricting M&A activity, might cause higher competition, either through independent new players or other large caps entering the sector through acquisitions.

6) Declining corporate culture: One of FB's biggest assets is being able to attract highly skilled people. On Glassdoor's "best place to work" list FB has been ranked first since three consecutive years. Aside from the material perks, people also choose to work for FB, because they believe in the company's purpose of connecting the world. However, the recent allegations[48] against FB's are likely to harm its corporate culture, as employees might not believe in the company's mission anymore. In our view, the dramatically increased number of leaks of confidential information since 2016 are an indicator for this development, especially since they used to happen much less before[49]. The leaks include delicate information like how to target emotional vulnerable teenager[50], information about a censorship tool for China[51] and an internal memo by a FB vice president saying "We connect more people, that can be bad if they make it negative. Maybe it costs a life by exposing someone to bullies. Maybe someone dies in a terrorist attack coordinated on our tools"[52], which was a PR disaster, particularly after the data scandal. Also, the loss of the WhatsApp CEO and co-founder Jan Koum who reportedly left due to FB's privacy intrusion shows cracks in FB's idealistic world. Even though the leaks and negative publicity might not

[46] Sen. Ron Wyden (Democrat, Oregon)
[47] Stories feature in FB, WA, IG and Messenger
[48] Fake news, News Feed addiction, violence on Facebook Live, cyberbullying, abusive ad targeting, election interference and, data privacy scandals
[49] Techcrunch, "Who wants to work on a weapon?", 30/03/2018
[50] The Guardian, "Facebook told advertisers it can identify teens feeling 'insecure' and 'worthless'", 01/05/2017
[51] BBC, "Facebook 'made China censorship tool'", 23/11/2016
[52] Andrew Bosworth, VP of Augmented Reality, leaked on Buzzfeed, 29/03/2018

have an immediate impact on financials, if the trend continues, it will weigh on the corporate culture and has to potential to eventually decrease shareholder value.

7) Share structure and CEO's control: In recent years FB has come under pressure in numerous cases, most notably for the Russian US election interference 2016 and the revealed data scandal in 2018, which led to a testimony of Zuckerberg before the US senate as well as calls for him to step down. This leads to the question, if the current corporate governance structure, under which Zuckerberg has massive power over the company's decisions, is still tolerable or presents an inacceptable risk for the future of the company. Typically, the premium for value of control is smaller in well managed companies[53], which we still assume is the case for FB. However, as a long-term investor, we do not know whether today's managers will also be perceived as good managers in the future. Therefore, the limited possibilities for shareholders to replace Zuckerberg as CEO or influence major corporate decisions, represents a key risk for investors, especially in the limelight of most recent events.

The Sector

Due to the nature of FB's platform business model, in which it acts as intermediary between businesses and users, it is necessary to analyze two sides for a comprehensive sector analysis: The business side which generates the revenue, namely advertising and the user's side which provides free social media and instant messaging platforms.

Advertising

As an advertising company FB does not only compete with digital channels like websites, social media networks, search engines, etc. but also traditional ad platforms like TV, radio, print and out-of-home. In 2017 the global advertising market, which comprises all channels, reached a revenue of 508$bn[54] and has been growing with a historical CAGR of 4.7% between 2011 and 2017. The **digital ad industry has been the growth driver of the sector with a CAGR of 18.5%**. The industry was able to entice many customers away from offline channels, leading to an increase of its market share from 20% in 2011 to 41% in 2017, while the traditional channels lost ground to its digital peers and even saw their business shrinking, with a CAGR of -0.6% in an overall growing market. In 2017 the internet advertising was for the first time the largest market, overtaking TV advertising, with 209$bn and 178$bn in revenue, respectively. We expect digital advertising to continue to grow faster than every other channel, with an

Figure 45: *Ad Market stats*

Global	2018	2019	2020	2021
Internet Ad Spending	236,769	263,937	291,254	319,403
y/y growth	*13%*	*11%*	*10%*	*10%*
Advertising Spending	534,786	553,898	581,039	601,180
Internet Share	*44%*	*48%*	*50%*	*53%*

Source: *Magna*

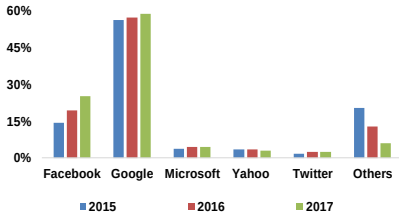
[53] Damodaran: Musings on markets: dual share structure

[54] Source: Magna

estimated CAGR of 10.7% between 2017 and 2022. In the long run, the rising sector weight of digital advertising should make its growth rates converge to historical average growth of the total ad market of approximately 4.6%[55].

In terms of digital ad sector breakdown, we can divide it into the following segments: search, social, display, online video and other[56]. Within these segments, the growth rates differ greatly. Social and online video advertising show the highest expected CAGR for the next five years with 17.4% and 22%, respectively, while search advertising is only estimated to grow 9.5% and display advertising could even decrease by -6.4%. Regarding devices, mobile ads are expected to outgrow (CAGR '17-'22: 18.8%) desktop ads clearly (CAGR: 10.7%). Since most of FB's revenue comes from mobile devices (87%), social media and online video ads, **FB has full exposure to fastest growing segments**, which should allow it to continue to grow faster than the total digital ad sector.

Figure 46: *Market Shares digital ad market, excluding China 2015-2017*



Source: *Statista*

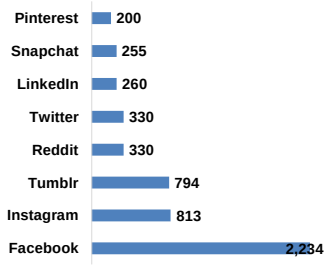
With respect to market players, we only focus on firms operating in the digital advertising industry, as we see them as the most viable competitors. China will not be considered in the analysis, since FB is banned there, and we do not expect legislation to change soon. Based on market shares, FB's biggest competitors are Alphabet, Microsoft (including LinkedIn), Yahoo! and Twitter. These firms have a very dominant position, taken together, they accounted for 94% of the digital ad market in 2017 compared to 80% in 2015. In that period FB managed to increase its market share drastically (+11%) from 14% to 25%. While Alphabet and Twitter also gained shares (+3% and +1%), Microsoft remained constant at 4% and Yahoo! lost 1%. The gained market shares of the major platforms mainly stem from minor players, which lost 14% in the last three years. Snapchat and Amazon do not have a meaningful market share yet, but they are expected to both reach 1% in 2018, which could indicate the rise of new credible competitors. As previously said, **FB should grow faster than the total market and thus be able to increase its market share over the next years.**

Social Media

To analyze the social media sector, one has to understand the key metrics that are crucial for every social network: user engagement and number of users. Since most players apply different methods to calculate engagement rates or do not publish them, the analysis focuses on the user number potential, which is based on factors like **population growth, future internet penetration and social media penetration**. The total world population is expected to grow by an

[55] Source: Magna
[56]

Figure 47: *MAUs Social Media Players (in m)*



Source: *Statista*

average rate of 1.1%[57] between 2017 (7.6 billion) and 2021 (7.9 billion), while the worldwide internet users will grow from 3.5 billion MAUs to 4.1 billion MAUs, corresponding to an average growth rate of 4.6%[58] and finally global social media MAUs numbers are estimated to grow 5.3%[59] in the same period. Thus, one can say social media usage is growing slightly faster than internet access and much faster than the total population with most growth coming from Asia, Africa and Latin America, in which also FB is expected to have the highest future growth rates.

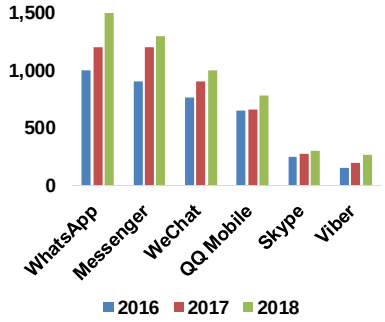
In terms of user numbers, **FB itself is the clear market leader** followed by Instagram, another FB platform, overcoming recently Tumblr with 794 million users and Reddit, Twitter, LinkedIn, Snapchat and Pinterest, which all have less than 500 million MAUs. This does not mean, users are all exclusively on FB. On average an internet user has 7 social media accounts today, compared to only 3 in 2012, according to global web index, showing that the social media is trending as a whole. Regarding the popularity of each platform among marketers, there is a wide dispersion. According to a US survey by the social media examiner in 2017 almost all advertisers were using FB (94%), more than half of the marketers used Twitter (68%), LinkedIn (56%) and Instagram (54%), while Pinterest (30%) Snapchat (7%) are not fully embraced yet as a marketing channel. Although these players are all in the same sector, they differentiate in their themes: Snapchat is mostly focused on audiovisual content and AR features; Pinterest offers users a collection of photos, gifs and short video; Twitter's focus is on real-time moments and is used by many people as primary source for breaking news; LinkedIn, which was acquired by Microsoft in 2016, established itself as leading social network for professionals and is increasingly investing in content similar to news articles in FB's news feed. While, we expect FB to remain market leader, a **potential threat could be that young people perceive new platforms as more interesting and innovative**, as Snapchat has shown with its stories feature.

Mobile Messaging

Mobile messaging comprises all apps that enable users to send messages, photos, and videos to others. Due to the rise of smartphones usage and widespread accessibility of mobile internet, users have moved from SMS to instant messengers as primary texting option. By the end of April 2018, WhatsApp and Messenger, were market leaders, having 1.5 billion and 1.3 billion MAUs respectively. Facebook's closest competitors, WeChat and QQ Mobile, which account for 1 billion and 0.8 billion users, are both products of Tencent,

[57] Source: Worldbank
[58] Source: eMarketer
[59] Source: eMarketer

Figure 48: *MAUs Messengers (in m)*



Source: *Statista*

China's largest internet company. The reason why we include these two is, not because we expect FB to become a major player in China, but because FB and Tencent are competing in many Asian and African markets outside China. With WeChat's wide array of services and experience in developing features for low income users in rural China, WhatsApp and Messenger might be challenged in these regions in the future. However, so far QQ Mobile and WeChat have not been very successfully to expand outside of China. The other two players, Skype and Viber, are part of the tech companies Microsoft and Rakuten. While Skype is mainly used for office purposes, especially video calling, Viber is similar to WhatsApp and serves primarily the C2C market, with a regional focus on selected Asian and Eastern European countries, in which WhatsApp does not have a dominant position yet. Given WhatsApp's and Messenger's massive user base and being the most used messenger in the world, it will be hard for competitors to break through these network effects and challenge FB's dominant position.

Valuation

To obtain a fair value estimate for FB, we conducted a DCF valuation and challenged our results in a scenario analysis as well as in a multiple valuation.

DCF Valuation

Assumptions

Firstly, we choose **not to explicitly forecast future acquisitions**, because even if they likely occur, the empirical literature shows that acquisition usually fail to create value, as synergies are transferred to the target through high premiums. Thus, the value of the company is unlikely to change.[60] Secondly, we assume a **constant capital structure throughout all years with a debt-to-equity ratio of 0%**, as it has been the case for the last two years already. Our reasons, why we believe the D/E ratio to remain zero, are because a lot of tech firms are inclined to employ a low or even zero debt capital structure, mainly due to the high uncertainty over future investments that might be required in the context of new upcoming technologies. Additionally, having debt might entail higher transparency requirements, which FB could be reluctant to provide. Thirdly, our assumption for the **payout ratio is 8% until FY20**, as it was also in the last year. The stable value is based on higher investment needs to implement regulatory requirements in the next three years. After that period, we expect the ratio **gradually rising to 45% until FY29** as the company matures. Similar payout

[60] Koller, Goedhardt, Wessels: Valuation: Measuring and Managing the Value of Companies

ratio developments can be also found at other maturing tech companies[61] and presents approximately the average payout ratio of the sector[62].

Discount Rates

In order to calculate the present values of our cash flows we need to estimate a discount factor that reflects the inherent risk of FB. As we are forecasting a constant zero debt capital structure, we only need to calculate a single WACC, which is in this case equivalent to the cost of equity. To compute the cost of equity we applied the Capital Asset Pricing Model[63] with the following inputs: as **risk free rate** we used the current US Generic Government 10 year index yield of **3.05%**; for the unlevered Beta[64] we run a regression analysis of the MSCI World and FB over the last three years, leading to a **Beta of 1.07**; and finally we used a **market risk premium of 5.1%**, which is based on the performance difference between the MSCI World and the US government 10 year yield over the same time period. Since we assume the current capital structure to be the same as the long term one, we do not need to re-lever beta. Eventually, given our inputs, we arrive at a **WACC of 8.52%**. However, with **0.80 – 1.34 the 95% confidence interval of our beta** is not very narrow, thus we also calculated the betas for different time horizons as well as the unlevered betas for two peers, to get some robustness to our estimates. FB's betas have steadily increased from a 3y-period to a 1y-period, indicating that FB is increasingly exposed to systematic risk over this time horizon (3y Beta: 1.07, 2y Beta: 1.1, 1y Beta: 1.7). Our peers, Twitter and Alphabet, have with 1.85 and 1.37 respectively considerably higher betas. Given FB's significant deviation, especially compared to Twitter's beta, we assessed what effect a change in beta would have on our valuation by running a sensitivity analysis. For that purpose, we used the beta bounds of our 95% confidence interval (0.8 and 1.34) as inputs for the WACC as well as a 0.5% deviation of our terminal growth rate assumption. As a result, we obtain a price range from $181 to $386, which shows how dependent our price target is on these parameters.

Figure 49: *Discount Rate Inputs, WACC calculation*

Risk-free rate	3.05%
Market Risk Premium	5.10%
Beta	1.07
Cost of Equity	8.52%
Debt / Debt + Equity	0%
Equity / Debt + Equity	100%
Statutory Tax Rate	21%
WACC	**8.52%**

Source: *Bloomberg, Analyst Estimate*

Figure 50: *Sensitivity Analysis, WACC and g*

Growth Rate \ WACC	7.0%	7.8%	8.5%	9.3%	10%
2.5%	319	269	232	204	181
2.8%	333	279	239	209	185
3.0%	348	289	**246**	214	189
3.3%	366	301	254	220	193
3.5%	386	314	263	226	198

Source: *Analyst Estimate*

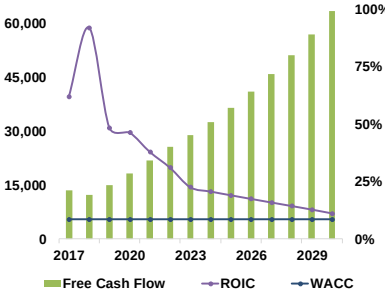
Valuation Results

The foundation for our DCF valuation is the projection of the unlevered free cash flows. To make an accurate estimate, we first forecasted the revenue for each core product based on its key value drivers and together with the estimation of the cost drivers and the balance sheet changes we projected the unlevered free cash flows. Our detailed projection period lasts until FY24, after which we

[61] E.g. Apple constantly increased its pay out ratio over the years
[62] Damadoran Blog, "Data update dividends", 09/01/2017
[63] CAPM: Cost of Equity = Risk Free Rate + $Beta_{unlevered}$ * (Market Risk Premium)
[64] FB had de facto no debt in those three years

assume a transition phase until the perpetual growth rate of 3% is reached in FY30. The decline of the free cash flow from FY17 to FY18 can be traced back to increased investments into platform security, content for Watch and innovation initiatives like AI, AR/VR and connectivity (CAPEX FY17: 8.3$bn, FY18: 14.9$bn). Since the company also indicated "continued growth in capital expenditures beyond 2018", we do not expect CAPEX to bounce back, but rather see it gradually rising from the level of FY18 (Q1 FY18 Conference Call). The increasing operating cash flow arises from the expected revenue growth of the core products. Taken together, the investment cash flow and operating cash flow projection, we get to the unlevered free cash flows, which are growing throughout all years. To calculate the enterprise value (EV), the free cash flow stream is discounted at the WACC and summed up. Subsequently we arrive at an **EV of the core business of 683.6$bn**, whereby the **terminal value makes up 64.4% of the total EV**. From there on, the net cash, 45.1$bn in marketable securities, is added to the EV, leading to a **market capitalization of 728.7$bn**, which corresponds to a fair value estimation of $246 per share. As we can see in the chart on the left, the ROIC is stabilizing throughout the years. For our terminal value we assume an implicit ROIC of 11.2%, which is above our 8.52% WACC. The reason for assuming this spread, lies in the **competitive advantages of FB**. In our view, it has built a monopolistic platform structure with strong network effects, which makes it very hard for customers to replace the product with a competing service. Furthermore, with the increasing amount of offered features we expect users to be locked into FB's network even more.

Figure 51: *WACC, ROIC, Free Cash Flow, ROIC 2010-2017*



Source: *Analyst Estimate*

Scenario Analysis

Aside from our base scenario, we also computed two grey sky scenarios, which could arise from the impact of future regulation. First, we assumed, **FB will not be able to increase its ad prices anymore (constant CPM)**, since the increased data regulation could impact the FB's ad targeting skills and thus the ROI, it generates for its advertisers. As a result, we reach a share price target of $169, which is not only significantly below our price target, but also below the current stock price. In a second scenario, we assumed **the deteriorating brand trust substantially slow down user growth**. Therefore, we modeled slightly decreasing user numbers in US & Canada (-3% yearly), constant numbers for Europe and 50% lower growth for Asia and Rest of World than in our base scenario. Thereby we arrive at a price target of $219, which is still 19% above the current share price, but 12% lower than our DCF Valuation result.

Multiples Valuation

In addition to the scenario analysis, we also conducted a multiples valuation based on internet firms which all have a substantial revenue exposure to the digital ad market. Thereby, we first used the current EV/EBITDA ratio of our comparables and reached a price target of $203. On the basis of the forward P/E ratio of our peers, we arrived at an implied share price of $252. Both results show a current undervaluation of the share. While the EV/EBITDA valuation indicates a lower upside potential with 11%, the forward P/E valuation shows with 38% a similar upside potential, compared to our DCF valuation which has a potential upside of 35% and a target price of $246.

Figure 52: *EV/EBITDA Ratio - multiples valuation*

Company	EV to EBITDA
Alphabet	16.8
Twitter	42.0
Yandex	20.8
Weibo	46.5
Baidu	18.9
Facebook	**18.6**
Median	**20.8**
Implied Share Price	**203**

Source: *Bloomberg*

Figure 53: *Forward P/E Ratio - multiples valuation*

Company	P/E Ratio
Alphabet	24.5
Twitter	50.2
Yandex	38.8
Weibo	37.7
Baidu	28.2
Facebook	**24.8**
Median	**33.0**
Implied Share Price	**252**

Source: *Bloomberg*

Appendix

Financial Statements

Income Statement

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Revenue	**40,653**	**57,378**	**71,254**	**87,314**	**103,472**	**118,828**	**131,366**	**143,761**	**155,784**	**167,141**	**177,533**	**186,668**	**194,270**	**200,098**
Advertising	39,942	56,041	68,924	83,881	98,827	113,007	124,313	135,619	146,961	157,675	167,479	176,096	183,267	188,765
Payment and other Fees	711	1,337	2,330	3,433	4,645	5,821	7,053	8,142	8,823	9,466	10,055	10,572	11,003	11,333
Cost of Revenue	-5,454	-8,607	-10,688	-13,097	-15,521	-17,824	-19,705	-21,564	-23,368	-25,071	-26,630	-28,000	-29,140	-30,015
Gross Profit	**35,199**	**48,771**	**60,566**	**74,217**	**87,951**	**101,004**	**111,661**	**122,197**	**132,416**	**142,070**	**150,903**	**158,668**	**165,129**	**170,083**
R&D Expenditures	-7,754	-12,729	-15,807	-19,370	-22,955	-26,362	-29,143	-31,893	-34,560	-37,080	-39,385	-41,412	-43,098	-44,391
Marketing and Sales	-4,725	-7,000	-9,610	-11,776	-13,955	-16,026	-17,717	-19,389	-21,010	-22,542	-23,943	-25,175	-26,201	-26,987
General and Administrative	-2,517	-3,942	-4,896	-5,999	-7,109	-8,164	-9,026	-9,877	-10,704	-11,484	-12,198	-12,826	-13,348	-13,748
Depreciation (included in CoR)	-3,025	-4,579	-6,129	-7,414	-8,710	-9,943	-10,947	-11,942	-12,909	-13,822	-14,659	-15,393	-16,004	-16,471
EBIT	**20,203**	**25,100**	**30,253**	**37,072**	**43,932**	**50,452**	**55,775**	**61,038**	**66,142**	**70,964**	**75,377**	**79,255**	**82,483**	**84,957**
Interest and other Income/Expenses	391	1,066	1,481	2,012	2,668	3,455	4,365	5,227	6,162	7,165	8,230	9,350	10,516	11,716
Pre-Tax Profit	**20,594**	**26,165**	**31,734**	**39,084**	**46,600**	**53,907**	**60,140**	**66,265**	**72,304**	**78,129**	**83,607**	**88,605**	**92,998**	**96,673**
Provision for Income Taxes	-4,660	-6,499	-7,874	-9,690	-11,543	-13,339	-14,860	-16,357	-17,830	-19,246	-20,572	-21,777	-22,829	-23,700
Net Income	**15,934**	**19,667**	**23,860**	**29,393**	**35,057**	**40,568**	**45,279**	**49,908**	**54,475**	**58,883**	**63,034**	**66,828**	**70,169**	**72,974**

Balance Sheet

Assets	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cash & Cash Equivalents	8,079	6,924	5,521	6,767	8,762	14,045	21,309	28,893	36,432	43,462	49,383	53,446	54,748	52,225
Marketable Securities	33,632	45,108	59,358	76,821	97,515	121,281	147,554	176,307	207,463	240,891	276,398	313,732	352,586	392,605
Accounts Receivable	5,832	8,109	10,070	12,339	14,623	16,793	18,565	20,316	22,015	23,620	25,089	26,380	27,454	28,278
Prepaid Expenses and Other	1,020	1,440	1,788	2,191	2,596	2,981	3,296	3,607	3,909	4,194	4,454	4,684	4,874	5,021
Intangible Assets, net	1,884	1,696	1,526	1,373	1,236	1,112	1,001	901	811	730	657	591	532	479
Goodwill	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221	18,221
Property and Equipment, net	13,721	21,804	29,927	36,672	43,458	49,908	55,174	60,380	65,429	70,199	74,564	78,400	81,593	84,041
Other Assets	2,135	4,590	7,125	10,478	14,486	16,636	18,391	20,127	21,810	23,400	24,855	26,133	27,198	28,014
Total Assets	**84,524**	**107,890**	**133,536**	**164,862**	**200,898**	**240,978**	**283,511**	**328,751**	**376,090**	**424,717**	**473,620**	**521,587**	**567,206**	**608,883**
Liabilities and Shareholder's Equity														
Accounts Payable	380	1,659	2,060	2,525	2,992	3,436	3,799	4,157	4,505	4,833	5,134	5,398	5,618	5,786
Deferred Revenues	98	168	209	256	303	348	385	421	456	490	520	547	569	586
Accrued Expenses and Other Current Liabilities	2,892	4,159	5,165	6,329	7,500	8,613	9,522	10,420	11,292	12,115	12,868	13,530	14,081	14,504
Partners Payable	390	550	684	838	993	1,140	1,260	1,379	1,494	1,603	1,703	1,791	1,864	1,920
Other Noncurrent Liabilities	6,417	8,969	11,138	13,648	16,174	18,574	20,534	22,472	24,351	26,126	27,751	29,178	30,367	31,278
Total Liabilities	**10,177**	**15,505**	**19,255**	**23,595**	**27,962**	**32,112**	**35,500**	**38,849**	**42,098**	**45,167**	**47,976**	**50,444**	**52,499**	**54,074**
Shareholder's Equity	**74,347**	**92,385**	**114,280**	**141,267**	**172,936**	**208,866**	**248,012**	**289,902**	**333,991**	**379,549**	**425,645**	**471,143**	**514,707**	**554,810**

Cash Flow Statement

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
NOPLAT	15,680	18,825	22,690	27,804	32,949	37,839	41,831	45,778	49,607	53,223	56,532	59,441	61,862	63,718
Depreciation	3,025	4,579	6,129	7,414	8,710	9,943	10,947	11,942	12,909	13,822	14,659	15,393	16,004	16,471
Gross Cash Flow	**18,705**	**23,404**	**28,819**	**35,218**	**41,659**	**47,781**	**52,778**	**57,720**	**62,515**	**67,045**	**71,191**	**74,835**	**77,866**	**80,189**
Change in Working Capital and Others	-880	-32	-331	-3,253	-4,014	-7,202	-8,831	-9,132	-9,041	-8,449	-7,220	-5,205	-2,252	1,794
Net Capital Expenditure	-8,327	-14,929	-16,618	-17,359	-19,367	-18,419	-17,857	-18,783	-19,551	-20,101	-20,405	-20,443	-20,202	-19,681
Change in LT Assets and Liabilities	4,115	3,819	3,175	3,675	3,697	3,513	2,869	2,836	2,751	2,598	2,378	2,090	1,739	1,333
Cash Flow from Operating Activities	**13,613**	**12,262**	**15,045**	**18,280**	**21,974**	**25,674**	**28,959**	**32,641**	**36,673**	**41,093**	**45,944**	**51,277**	**57,151**	**63,635**
Interest Income after Taxes	262	893	1,221	1,641	2,159	2,781	3,499	4,181	4,919	5,711	6,553	7,438	8,358	9,307
Decrease (Increase) in Marketable Securities	-13,086	-11,476	-14,251	-17,463	-20,694	-23,766	-26,273	-28,752	-31,157	-33,428	-35,507	-37,334	-38,854	-40,020
Cash Flow from Investing Activities	**-12,824**	**-10,583**	**-13,029**	**-15,822**	**-18,535**	**-20,985**	**-22,774**	**-24,572**	**-26,238**	**-27,717**	**-28,954**	**-29,896**	**-30,496**	**-30,713**
Other Comprehensive Income	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60	-60
Interest Expenses	-8	-51	-51	-51	-51	-51	-51	-51	-51	-51	-51	-51	-51	-51
Net Cash Transactions with Shareholders	-1,257	-1,569	-1,904	-2,347	-3,328	-4,578	-6,074	-7,958	-10,324	-13,265	-16,879	-21,269	-26,544	-32,811
Cash Flow from Financing Activities	**-1,265**	**-1,620**	**-1,955**	**-2,398**	**-3,379**	**-4,629**	**-6,125**	**-8,009**	**-10,376**	**-13,316**	**-16,930**	**-21,320**	**-26,596**	**-32,862**

Revenue Estimation for new features

Jobs	MAUs (in m)	Revenue (in $bn)	ARPU (in $)
LinkedIn	250	5.84	23.36
Est. Jobs	100	-	18.69
Potential Revenue (in $bn)	1.87	We estimate FB's ARPU 20% lower than LinkedIn's given the focus on rather low-skilled workers and see a current MAU potential of 100m	

Marketplace	Active buyers (in m)	GMV (in $bn)	GMV/active buyers (in $)	Est. Fees	Explanation of Fees
eBay	168	88.4	526	9%	Adjusted Revenue/GMV
Etsy	33.3	3.2	97	7%	3.5% transaction fee + $0.20 listing fee
Est. Marketplace	400	120	300	8%	Average between Etsy and eBay
Potential Revenue (in $bn)	**9.0**	Currently Marketplace has 800m MAUs, we estimate 50% could be active buyers and used the average % fee of Etsy and eBay			

Dating	MAUs	Penetration Rate of Internet Users	Internet Users (in m, ex China)	ARPU (in $)
Market	468.5	12.8%	3,660	10.78
Est. Dating	200	ARPU based on Europe and US market data, estimated MAUs for FB based on number of people indicating they are single, ARPU much higher in a subscription model (Match Group ARPU: $197 for users having a subscription)		
Potential Revenue (in $bn)	**2.16**			

Watch	Price per Impression (in $)	CPM (in $)	Views leading to impressions	Views per year (in bn)
YouTube	0.2	7.60	4%	1,800
Est. Watch	0.2	7.60	4%	180
Potential Revenue (in $bn)	**6.84**	We estimate 10% of YouTube total annual views for Watch and kept the ad cost rates and conversion rates the same		

Workplace	Businesses	Employees per Business	Share of Subscriptions	Yearly Fee (in $)
Est. Workplace	30,000	5.00	25%	36
Potential Revenue (in $bn)	1.35	We estimate half of the businesses are paying and each business has on average five employees		

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Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

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