

MASTERARBEIT

Titel der Masterarbeit

„Twitter - A Deductive Discussion on Valuation Issues
and Value Drivers “

Verfasst von

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angestrebter akademischer Grad

Master of Science (MSc)

Wien, Februar 2015

Studienkennzahl lt. Studienblatt:
Studienrichtung lt. Studienblatt:
Betreuer / Betreuerin:

A 066 915
Masterstudium Betriebswirtschaft
Univ.-Prof. Dr. Gyöngyi Lóranth

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Wien, im Februar 2015

Martin Hintner

Acknowledgements

Firstly I would like to thank my parents for providing me with the opportunity to pursue whatever field of interest I chose. Thank you for supporting me in my decisions and providing invaluable guidance throughout every stage of my studies. Little would have been possible without the continued and unconditional backing of Dani who I owe much more to than can be expressed in these lines. I would also like to express my gratitude for my supervising professor Gyöngyi who had the patience to put up with my extended search for a topic and my shifting priorities in terms of spending my time. I could not have asked for a supervisor fitting me and my goals better. Lastly I would like to humbly and gratefully acknowledge the help I received throughout my studies from a number of people too large to be mentioned individually.

Thank you!

Table of Contents

1 Introduction and Research Objectives	1
2 The Dotcom Era as a Motivation for this Thesis	3
3 A Description of Twitter	18
3.1 Twitter's Business Model and Services	18
3.1.1 Twitter's User Bases and the Respective Product Offerings	19
3.1.1.1 The General User Base	19
3.1.1.2 Platform Partners	22
3.1.1.3 Advertisers on Twitter	23
3.1.1.4 Data Partners	24
3.1.2 Competition	25
3.1.3 Business Risks	26
3.2 Twitter in Numbers	29
4 The Difficulties of Classic Valuation Approaches	34
4.1 The Discounted Cash Flow Valuation	34
4.1.1 Methodology Overview	34
4.1.1.1 The Free Cash Flow	35
4.1.1.2 The Discount Rate	35
4.1.1.3 The Terminal Value	36
4.1.2 The Discounted Cash Flow Valuation Method and Twitter	36
4.2 The Relative Valuation and its Downsides	38
5 Understanding Twitter	41
5.1 Twitter as a Social Network	45
5.1.1 Virtual Social Networks	45

5.1.2 Valuation of Online Social Networks with Regards to Twitter	58
5.2 Twitter as a Two-Sided Market	64
5.2.1 Two-Sided Markets in the Literature	65
5.2.2 On Network Externalities	77
5.2.3 Regarding Competition in Two-Sided Markets	85
5.2.4 Implications for Value Drivers	91
6 Conclusion	94
Bibliography	i
Appendix	vi

List of Figures

Figure 1: Level of the Internet Stock Index versus the NASDAQ and the S&P 500 (May 1996-April 2001)	4
Figure 2: Historical Development of Monthly Active Users	30
Figure 3: Taxonomy of Internet Relationships	46
Figure 4: Social Media Cube to help classify and identify Social Media Platforms with examples	50
Figure 5: A Timeline of the Foundation of selected Online Social networks from 1997 to 2011	53
Figure 6: Revenue Models, Revenue Drivers and Implications for SNS	57
Figure 7: Different Network Structures	81
Figure 8: The Role of Structure, Conduct, and Basic Conditions in Network-Related Value Creation and Capture	83
Figure 9: Microsoft's Platform Envelopment of RealNetworks	88
Figure 10: Three Scenarios of User Overlap	90

List of Tables

Table 1: Excerpt from the Consolidated Statement of Operations	31
Table 2: Consolidated Statement of Operations Data as Percentage of Revenue	32
Table 3: Consolidated Balance Sheet Data from 2010 to 2013	32

1 Introduction and Research Objectives

Valuing newly public companies that are unprofitable and have an uncommon or innovative business model is among the hardest tasks to perform in company valuation. When looking at the newly public company Twitter one can detect all three of these characteristics. This in itself would already make an interesting topic for a thesis but furthermore, Twitter is operating with an online business model. These have been discussed heavily and controversially at the beginning of the new millennium because of the stock market crash that is known as the dotcom bubble.

The aim of this thesis is not to perform a valuation of Twitter, to justify or criticize any price the market values the stock at or to create a new valuation model that is tailored to this niche of company valuation. Rather I start at the academic literature during the late 1990's and early 2000's, the era now known as the dotcom era in which internet focused businesses first came up and provided difficult questions for the academic community in terms of valuation and the value drivers of the business models. After this excursion into the past I describe the services Twitter provides and I then move on to analyze the business model of Twitter by embedding it into the literature on social networks and two-sided markets. Through this abstraction of the business model it then becomes possible to deduct the value drivers of Twitter. These value drivers are necessary for the degree of Twitter's success or failure because they capture the fundamentals on which the business model operates and gives an analyst a deeper understanding of the state of the company and its potential. Any valuation done on Twitter (and similar companies) should take these value drivers into account in some form.

The thesis is structured in the following way: Section 1 consists of a short introduction and ends after this. Section 2 provides a review of the academic literature during the dotcom era concerning the valuations of internet stocks and the implications for this thesis. Section 3 gives an overview over Twitter as a company and the services it provides based on the company's self-representation through the annual report 2013. Section 4 covers the problems of traditional valuation methods handling the characteristics of young, not profitable and fast-growing companies. Section 5 analyzes Twitter from the perspective of two fields in the literature. At first the social network literature is visited followed by a summary of the academic literature concerning two-sided markets. After the (literature) reviews the strategic implications of both fields for Twitter's business model are deducted and discussed. Section 6 concludes.

2 The Dotcom Era as a Motivation for this Thesis

The period of the so-called New Economy, the dotcom bubble and the following stock market crash in the late 1990's and early 2000's lead to a couple of interesting questions concerning the topic of this thesis. Whether or not it is necessary or in fact careless to deviate from classic valuation models to value internet based firms is a valid question at least partly motivated by the stock market crash in the year 2000. There is a vast amount of literature describing the characteristics of the stock market during this time and the changes in the asset valuation fundamentals are amongst the most widely discussed issues. Topics covered by the literature include both the discussion of why the bubble occurred and what exactly happened to the stock market at the time. The chapter will firstly present the seminal papers regarding the changes to asset valuation during this period of time followed by possible explanations provided by the literature. It will conclude with thoughts on how the current situation on the stock market can be compared.

The period associated with the height of the dotcom bubble and its burst is timed roughly with the beginning of 1998 and ends late in the year 2000. In this time there were very high returns for so-called internet stocks of over one thousand percent on their public equity. These gains occurred until roughly February 2000 and were gone by the end of the same year. (Richardson and Ofek 2003)

The dramatic developments of the stock market during this period can be seen in Figure 1. From the year 1996 the Internet Stock Market Index (ISDEX) rose in spectacular fashion to reach its peak early in the year 2000 and lost in similar fashion during the remainder of the year. (Hand 2001)

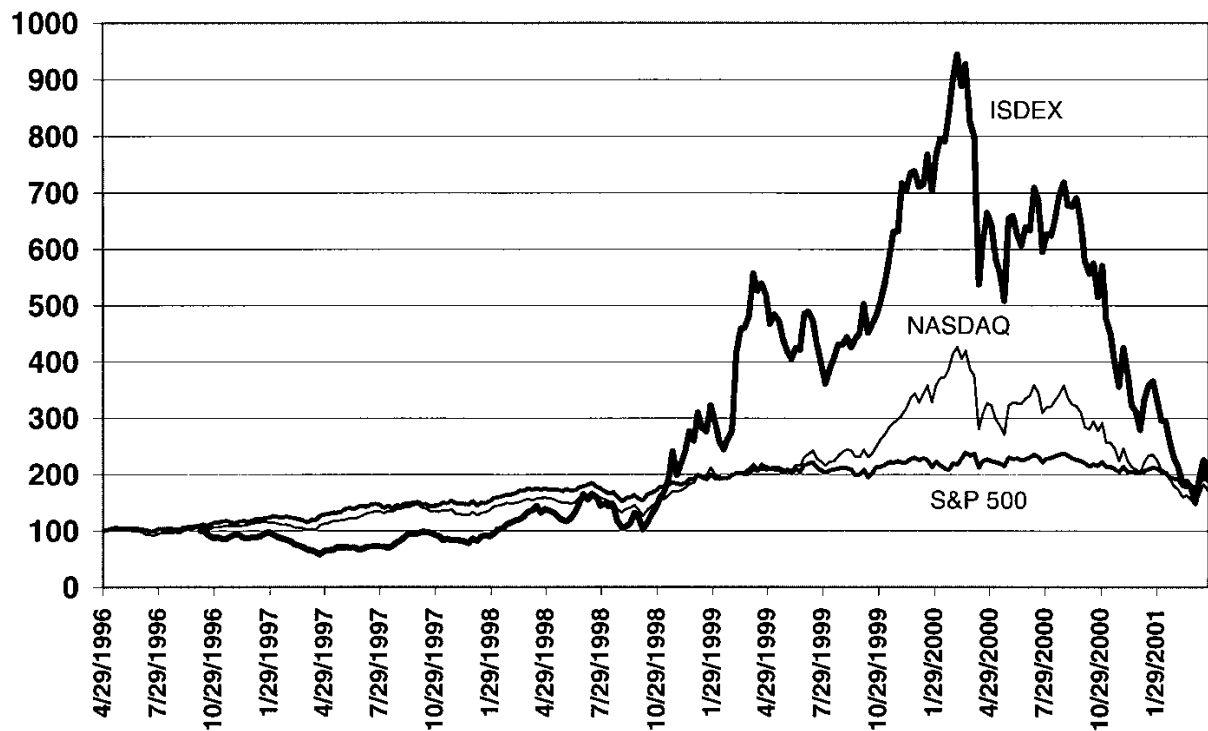


Figure 1: Level of the Internet Stock Index versus the NASDAQ and the S&P 500 (May 1996-April 2001). (Source: Hand 2001)

One phenomenon covered by several papers was the relationship between traditional value estimators or value drivers and the valuation of stocks. Papers covering this topic include Brown et al. (1999), Collins et al. (1997), Francis & Schipper (1999) and Morris and Alam (2012). For instance Francis and Schipper try to answer the question “*Would investments based on financial statement information earn progressively less over time?*” (Francis and Schipper 1999, 3) They test the linear relationship of information found in financial statements with stock returns and find mixed results. Over the sample period of 1952 to 1994 they find that while the earnings information declines in relevance, the balance sheet and book value information become more relevant. Furthermore they do not find significant differences in these relevancies between low- and high-technology firms. Some evidence is found, however, suggesting that balance sheet information explains variability in stock prices better for low-technology firms. Also the changes to the relevancy of information over the time of the sample cannot be shown to be consistently significant. (Francis and Schipper 1999)

Brown et al. (1999) argue that the approach of Francis and Schipper (1999) and similar studies is fundamentally flawed in their analysis of the correlation between accounting measures and stock returns because these studies use R^2 which, however, would have to be adjusted to scale. With this notion the authors revisit the studies done by Collins et al. (1997) specifically but their results hold true to similar works as Francis and Schipper (1999). They partially reverse the previous findings and conclude that the value relevance of accounting measures has in fact degraded in the four decades of the sample data. (Brown, Lo, and Lys 1999)

Core et al. (2003) do not only look at a possible degradation of the explanatory power of traditional financial variables in explaining the equity valuation of stocks during the New Economy Period but rather compare this subperiod with previous ones. Additionally to looking at a broad sample of firms they also specifically examine subsamples of high-technology firms, young firms and young firms generating losses which are usually referenced when talking about this period. Similar to the aforementioned studies the authors regress the market value of equity over the book value of equity, net income, R&D expenditures, advertising expenditures, capital expenditures and sales growth. These variables (in slightly different definitions) are included in most research at the time and make up a mix of firm level information and proxies for future growth in earnings. The findings of the work can be summarized by a decrease in the financial variables' ability to explain value in all subsamples during the New Economy Period. However, this decline is not caused by an unstable relation between the two sets of variables. This relationship is comparable to other subperiods which leads to the conclusion that the variation in firm valuations is due to other, omitted factors. (Core, Guay, and Buskirk 2003)

The more recent study of Morris and Alam (2012) expands the sample period until after the burst of the bubble in the year 2000. Their observations range from 1989 to 2006. Consistent

with former studies they find a decreasing value relevance of financial information up until the year 2000 which, however, is reversing afterwards. In their search for reasons for the decline of value relevance the authors found no significant influence of over-optimistic financial analysts (although analysts were significantly more cautious after the crisis) and only partial significance of perceived earnings quality. (Morris and Alam 2012)

The question whether or not traditional accounting and financial measures are in fact applicable to firms operating through the internet did not only occupy the academic literature but also practitioners and politics. An example of how important these issues were (and most likely still are) can be found by the advisory statement of the Securities and Exchange Commission (SEC) issued on December 4, 2001 cautioning public companies in the use of pro-forma information in their financial statements. The statement provided five propositions in order not to mislead investors by excluding some GAAP expenses in financial statements. This has in fact become common practice at the time as firms started to use their own calculations for adjusted financial measures. (SEC 2001)

Penman (2003) further discusses financial accounting in the aftermath of the crisis. He leads his arguments with the notion that earnings are very important in accounting simply because accounting is done for the shareholders who basically buy (future) earnings when investing into a company via stocks. Therefore it is important for reported earnings to be a meaningful input when predicting future earnings. This argument on the one hand counters the belief of “earnings do not matter”, common during the bubble period. On the other hand, however, it could also be used as a reasoning to use pro forma earnings figures outside of the GAAP to better represent reality. While admitting that current GAAP earnings alone are not sufficient to accurately predict future profitability, Penman warns of the sole use of pro forma statistics like

EBIT or EBITDA to make statements about the future. He concludes that the GAAP should definitely remain as independent from prices on the market as possible. Although he acknowledges several problems within the GAAP framework he nevertheless argues that pro-forma accounting is not the solution needed. (Penman 2003)

Lev and Zarowin (1999) name the increased importance and frequency of business change as the main problem why financial information got less relevant in the decades leading up to their paper. They analyze this problem from an accounting point of view and find flaws in the way intangible assets are handled. Contrary to other authors that see the New Economy Period solely as a bubble Lev and Zarowin propose changes to the way intangible assets are reported to better reflect the business reality and therefor render financial information more useful. (Lev and Zarowin 1999)

In order to find useful information the literature did not only resort to classic financial information. Trueman et al. (2000) try to explain market valuations by internet usage measures complementary traditional accounting information. They were motivated by the sometimes unique ways the press tried to justify the prices at which internet stocks were trading naming Yahoo! as an example which was listed at a price to earnings ratio of 580 as of April 11, 2000. They also cite an analyst report for the online retailer Amazon in which the analyst claimed to be able to justify a valuation of anything between \$1 and \$200 by altering the assumptions. The stated buy recommendation of the analysis was then based on arguments like the company's opportunities and management which naturally are hard to measure. Traditional valuation methods often have difficulties valuing young firms, with their very limited history and the rapidly changing industry being two of the main issues. To overcome these difficulties the authors try to look at different measures to get a grasp of the value of a firm operating via the

internet. Their expectations include that the user traffic on a firm's website is positively correlated to potential future revenues since it can be interpreted as consumer interest for the firm's product. While they find no significant relation between net income and a firm's stock price they do find relations when splitting up net income into its components. Here they find that gross profits are significantly and positively related to the stock price. Looking at non-financial measures both page views and unique users add incremental explanatory power as measures. Additionally they document that pageviews of the company's website add explanatory power when paired with profit while data on unique users is only significant in conjunction with bottom-line net income (which is on itself not significantly related) and no longer significant when combined with the components of net income. When dividing the sample into the two subsamples of internet retailers and companies based on advertising revenue generated on their sites the results differ slightly. Page views still are able to add incremental explanatory power to both subsamples, however, contrary to the overall sample bottom line net income is significantly and positively related to the stock price for the portal and content business consisting of the firms based on advertising revenue. So in this regard these firms are more similar to traditional firms. The data on unique users is not significantly related to the stock price for the internet retailer subsample when combined with bottom line net income, same as in the overall sample. These findings do not tell anything about whether or not internet stocks were fairly valued at the time, however, the authors show that there are indicators of value drivers outside of traditional financial information. (Trueman, Wong, and Zhang 2000)

Trueman et al. (2001) took the analysis of web traffic influence one step back and try to measure the capability to forecast revenues via web traffic. The time period covered by this study ranges from the fourth quarter of 1998 until the second quarter of the year 2000. The authors begin

with the notion that for the content and portal firms in their sample the current quarter's revenue growth is significantly correlated with the revenue growth of the quarter before. This does not hold true for the electronic retailer business segment, allegedly because of the strong seasonal effects in retailing. Their studies regarding the predictive power of web traffic measures yield mixed results and due to the very limited amount of data one has to be very careful when generalizing these results as mentioned by the authors. For the electronic retailer subsample the lagged web traffic yields incremental predictive power over a forecasting model based on historical revenue growth, but not for the portal and content subsample. When analyzing analyst forecasts the authors find an expected strong correlation of these forecasts with realized revenue data and more surprisingly a consistent negative bias towards forecasted revenues. This is in contrast to related literature findings in other industries documenting a generally optimistic bias. Past revenue growth data only has incremental predictive power over analyst forecasts in the case of content and platform firms but not for firms in the electronic retailing subsample. Past web traffic measures, however, are not found to have incremental explanatory power in any subsample when compared to analyst reports. Their conclusion is that perfect knowledge of web traffic during a quarter would help to predict the revenues of the same quarter (this is especially true for web-based retailers) and they make a point to improve the speed at which internet traffic data is made available. This conclusion is based on the fact that they find significant incremental predictive power when having perfect knowledge of the actual web traffic over analyst reports. (Trueman, Wong, and Zhang 2001)

Demers and Lev (2001) try to see which of the value drivers stick throughout the crisis. They develop a model that suggests over-valued internet companies prior to the crisis trying to analyze which value drivers are still relevant after the crash and if relatively over-valued companies suffer more during a correction. In addition to traditional financial variables the

study focuses on three internet traffic measures: Reach, stickiness and customer loyalty. Reach is therein related to unique visitors a site can attract, stickiness is based on the average time a user spends on the website and customer loyalty is based on returning visitors. The authors also look at advertising expenditures, R&D expenditures and several proxies for “cash burn”. Advertising expenditures are viewed as a proxy for intangible assets (or the investment into those) while R&D is viewed as a proxy for investment to (further) develop the product. Their findings suggest that the web traffic measures concerning reach and stickiness are significant value-drivers in both sample years (1999 and 2000). Investors tended to capitalize R&D and advertising expenditures before the crash but seemed to be more cautious in the year 2000. This leads to only product development expenses (R&D) being a value driver after the correction. A similar story can be told about the findings concerning the “cash burn” proxies. Here as well investors were more willing to capitalize expenses of firms that spent a lot of cash while being less forgiving after the market was more mature. Lastly the authors also conclude that firms that were relatively over-valued got hit harder in terms of stock price than their competitors with a fairer valuation. The results of the study are robust when adding variables generally used by the literature to describe industry corrections. (Demers and Lev 2001)

Gollotto and Kim (2003) summarized three different new valuation methods that were popular in mainstream press to explain the valuations found on the market. The first one of those is the “Discounted Cash Flow Earnings Potential” which tries to estimate the number of visitors of a site in the future along with their order size and frequency. Based on these projections it is then possible to get a revenue estimation. Afterwards a future revenue multiple is chosen which is then discounted to arrive at the present value of the company (valuation methods including relative valuation via the use of multiples will be discussed in this thesis in section 4). This method of course depended heavily on making projections in a very new industry with little to

no historic values to base these projections on. Another method commonly used was the “Price to Sales” method. Price to earnings multiples are often used to value companies but are of no use when valuing tech companies during the dotcom era because of the characteristic negative earnings. Therefore many practitioners started using a multiple of sales to prices. The problem with this method of valuation pointed out is the obvious problem of profit margins. Sales multiples have little value when profit margins are ignored. The third new valuation method presented by the authors is termed “Web-Centric Measures” and relies on web traffic related measures as pageviews, unique visitors and average acquisition costs which have already been described in this section to have certain value when predicting tech company stock prices. The authors also revisit the phenomenon shown by other authors that valuations of companies went up simply by putting “dot com” into the companies name without yet showing any new business model. This led to the conclusion that some sort of hype is an important factor for these valuations. To differentiate companies which have valuations based on hype (which the authors believe is in itself created by marketing expenses) and companies having better product offerings. To achieve this they propose a measure of “R&D versus Hype” consisting of the R&D spending of a company divided by the sum of R&D, sales and marketing spending. The authors then divide their sample into a high and a low segment by the median of the ratio. They are then able to show that this ratio that they believe shows a company’s dedication to product management is indeed positively correlated with the stock price and can therefore be seen as a value driver for the internet sector at the time. The research is, however, limited by a small sample size without considering differences in the companies’ business models according to the authors. (Gollotto and Kim 2003)

Rajgopal et al. (2002) conducted a study focusing on B2B (Business-to-Business as opposed to B2C which stands for Business-to-Consumer) firms in the internet sector. Because of their

sample firms' focus on the B2B sector the web traffic measures found to be a value driver for consumer related internet firms where not believed to be relevant. The accounting information, however, was comparably sparse to other internet firms at the time (only one firm out of the sample of 57 had reported an annual profit despite the combined market value of equity of over \$100 billion in September 2000). Therefor the authors focused on managerial actions, more specifically the announcements hereof, as a possible value driver in the B2B internet sector. The actions were classified into nine categories (including for example acquisitions, organizational changes or acquisitions of a major customer). It was shown that nearly all of the actions have a significant impact on the stock price volatility in the days surrounding the announcement. These volatility increases were of a bigger magnitude than the ones surrounding earnings announcements. Therefor the authors concluded that the information content for investors was in fact higher in the announcements of managerial actions than in the announcements of earnings. In a second step the managerial action categories were grouped into two broader "managerial initiatives" (market penetration and organization building). The counts of these actions are then analyzed in regard to stock returns and are able to explain a significant portion (over 25 percentage points) of the cross-sectional variation in the time the authors refer to the "post-IPO life", meaning the time between the firm's IPO and the end of the study in September 2000. The authors conclude that in the sector of B2B internet firms managerial actions contain significant information regarding the firms' equity valuation. (Rajgopal, Venkatachalam, and Kotha 2002)

In their search why the downturn of the internet sector in the early month of 2000 happened Keating et al. (2003) try to answer the question whether new information has become public during that time. This would be consistent with the widely-known concept of a semi-strong efficient market which states that past (and therefor publicly known) information is already

incorporated in stock prices. The study authors look at publications that were released during the chosen period of March 13 to May 26, 2000. Keating et al. focus on information concerning earnings including press releases, analyst reports, audit qualifications and 10-K/10-Q releases. They also include several non-financial indicators that were found in the literature to have a significant effect on the price. Using a broader sample than most other researchers in this field of interest they include what they call “support firms” which consist of suppliers of infrastructure for internet access (including performance software and (web) designers). Their hope is to derive statements that hold for the whole industry and which are not specific to certain business models. The findings are summarized by being not consistent with the expected news to trigger such a decline. Earnings surprises and analyst earnings forecasts revisions were overall positive, only the ratio of changes in trade recommendations is slightly negative, although the average recommendation remains between a buy and a strong buy recommendation. They do also find that accounting variables are explaining changes in prices better than web traffic measures used by other researchers. Overall the authors offer the conclusion that investors have reassessed the data of 1999, specifically gross profit and expenses (consistent with other prior research). This is hard to explain when assuming semi-strong efficient markets. (Keating, Lys, and Magee 2003)

Lewellen (2003) issues serious doubt about the rationality of investors at the time of the New Economy Period. In his discussion of Keating et al. (2003) he points out several facts as evidence for irrationality in that time period. He also comments that some of Keating et al.’s measures do not have a clear interpretation because they are subject to the underlying business models of the different firms. He concludes with remarks that due to the irrationality of the internet firms’ valuations the perceived disconnect of reported financial variables and the

observed stock prices tell very little about problems in the underlying financial reporting system. (Lewellen 2003)

Ofek and Richardson (2003) see the restriction of short-selling as one of the main contributors to the creation of the bubble. According to them the more pessimistic or realistic investors were held off from influencing the market price of the stocks while the optimistic investors helped the prices to get inflated. With lockup agreements being the strictest short selling constraint the burst of the bubble can be explained by the ending of these agreements. Since investors under such an agreement are prohibited from selling the expiration date of the lockup allows the pessimistic investors to enter the market and influence the price. Ofek and Richardson argue that in February 2000 a comparatively high number of lockup agreements expired and the sudden entrance of a significant number of pessimistic investors caused the burst of the bubble. (Richardson and Ofek 2003)

Hand (2001) finds evidence that internet stocks were not entirely irrationally priced and that supply and demand did not significantly influence the stock prices. His study design analyzes four different categories of firms at two distinct points in time. He divides his sample into internet related firms (with and without significant customer traffic), random non internet related firms and firms that went public at a similar time as the internet firms but are themselves not related to the internet. These groups of firms are looked at in March, 2000 and December, 2000. These points in time correlate with the peak of the New Economy Period valuations and a point in time well after (see Figure 1 for comparison). Hand find that internet stocks with customer related web traffic got rewarded for negative earnings (because Investors capitalized them as investments into intangible assets) at the peak (March, 2000) but punished negative earnings for those firms in December, 2000. Web traffic was positively priced on both points

in time. However, the three other groups of firms behaved similarly to analyst earnings forecasts in 2001 and to the long-term growth of earnings. These similarities occur despite the economic fundamentals of the firms being very different. Hand arrives at the conclusion that because these firms behave similarly one cannot claim that internet firms were priced irrationally during the New Economy Period. Furthermore he looks at two proxies for supply and demand of internet stocks (public float and short interest) which should not have an influence on pricing when assuming efficient markets. In fact he does not find any significant influence that these proxies had on the valuation of internet stocks. (Hand 2001)

If one aims to compare the NEP of the late 1990's with today's market and valuations for stocks of internet based companies one has to be somewhat careful. There is little doubt that the market was too optimistic on the valuation of these particular stocks and the argument that new value drivers for asset valuation are dangerous definitely have its justification. However, an important thing to mention is how the angle from which internet based firms are judged has changed. The primary reason to group these firms was the fact that they were operating in some manner related to the internet. Today the internet is not that new anymore so people can understand it more as a distribution channel rather than the defining aspect of a business model. Trueman et al. (2000) already divided their sample of internet firms into three subsets: internet portals (which are not really existing anymore today), content/community providers which specialize onto a specific group of people and internet retailers (called e-tailers). On the other hand Keating et al. (2003) saw the internet as a single business sector and included support firms in their sample. This meant that firms financing themselves via advertising were analyzed in the same fashion as firms selling performance software

.

Today we have a better understanding of the internet and therefore a different approach should be chosen. Rather than seeing internet based firms as a blackbox and searching for value drivers in a “top-down” approach this thesis tries to understand the business model of the chosen company (Twitter), embeds the business model in the literature and searches for value drivers in a “bottom-up” fashion. What I mean by “top-down” is that the studies during the New Economy Period started with the stock price and then tried to find information on the firm explaining this price. In the “bottom-up” approach of this thesis the business model of the company is analyzed to find the fundamental value drivers which then could be used to justify or criticize the stock price of a company. This approach is made possible mostly due to our understanding of the internet which is no longer comparable to the 1990’s. For example Rajgopal et al. (2002) is a study that starts to divide the internet sector into different business cases by analyzing only B2B companies and finding that managerial actions convey information relevant for these firms’ equity valuation.

One can also reason this approach from a different angle, arguing that the prices of firms are generally not safe to use as a starting point to find the intrinsic value of a firm. The study of Core et al. (2003) as described above can be used as an example to show that while certain periods like the New Economy Period may experience a decline in the explanatory power of firm level information in regards to firm value this has not been unusual for numerous historic subperiods. Similarly Keaton et al. (2003) find that the correction in the year 2000 was most likely not caused by newly published information which makes a strong argument against semi-strong efficient markets. The discussion of Keaton et al. (2003) of Lewellen (2003) comes to a similar conclusion in the regard that all evidence points to irrationality of investors during the dotcom era. Trueman et al. (2003) document a pattern in the movement of Internet stock prices during the time period of 1998. The stock price moved up a significant 4.9 percent in the five

days leading up to a quarterly earnings report followed by a significant price drop of -6.4 percent in the five days after the announcement. These returns are market adjusted and explained by the authors by the presence of price pressure from investors because the price movements are not related to positive or negative earnings surprises. These results, although relatively dated at the time of this thesis, can be interpreted as further evidence that the stock market has a hard time finding fair valuations for internet companies at least in the short run.

Some of the lessons learned during the New Economy Period of the late 1990's still hold true until today. It is still a very difficult task to value young internet companies. While today we have a better understanding of the internet and its possibilities, the underlying problem of judging a new business model still remains. Also the fact that there is little to no history and most of the times no reported profit as a starting point for forecasts necessary for any valuation provide further complications. I argue that these points underline the need for a thorough understanding of a company's business model in order to find value drivers that should also be more robust to short-term corrections of the stock market.

3 A Description of Twitter

This section aims to describe the business model Twitter. Understanding the business model of a company is naturally crucial to the valuation process, no matter which valuation method is used in the end. The section is divided into two parts, the first describing the underlying business model and the company Twitter itself. The second part focuses on the financial point of view and provides information on the growth figures of Twitter. These two sections are based on the annual report of 2013 (Twitter 2013). It can be argued that the data from the annual report of 2013 might already be close to outdated at the time of this work, however, with the frequent adjustments to details in the product offering of internet firms, this annual report provides information on the company's offering that are better suited to provide insights into the core offering as opposed to the latest experiments.

The main source for sections 3.1 and 3.2 is the annual report of 2013; all information, if not cited otherwise, is taken from there. (Twitter 2013)

3.1 Twitter's Business Model and Services

Twitter describes itself as a “[...] *global platform for public self-expression and conversation in real time.*” (Twitter 2013, 3) The company provides an online platform on which users can create and share short text messages. These so-called “Tweets” are limited to 140 characters of text. While the use of the platform is free, Twitter generates most of its revenue via advertising. As of December 2013 Twitter had more than 240 million average users per month creating approximately 500 million daily tweets.

3.1.1 Twitter's User Bases and the Respective Product Offerings

One of the most defining factors for Twitter's business model is that Twitter as a platform brings together different user bases and has a different product offer for each of them.

3.1.1.1 The General User Base

This user group is the one defining Twitter to the public opinion. Everyone can join Twitter via creating an account and starting to tweet at her followers or read tweets from people followed. More specifically Twitter's product offer to the general user is mainly defined by the following actions and provided features:

- **The Timeline**

The user's timeline contains her own tweets as well as tweets from users she follows. The most recent tweets are shown at the top of the timeline and the line proposes to be refreshed whenever a new tweet by a followed user is created. The timeline is the defining element of the user experience and is also one of the places where Twitter can include advertising. This is done by so-called "sponsored tweets" which are tweets that show up on a user's timeline without the owner of the timeline having to follow the user who sent the sponsored tweet. When rich media as for example video content or a picture is attached to a tweet the media is displayed as a preview on the timeline.

- **Self-Expression Mechanisms**

Twitter lists many of its core features under self-expression mechanisms. The most iconic one is the ability to compose a tweet. A tweet being a message limited to 140 characters. This

message is then sent to the followers (see social mechanisms below) of the user and is public, meaning that users can search Twitter for keywords and if the tweet fits the search it can be seen by anyone. The user can attach media to the tweet such as photos, videos as well as links or other content.

Each Twitter user has a profile which provides personal information on the user. Most of the information is optional but the user is able to upload media, enter a description, location, her website and other information she is willing to share. The profile also includes the users the account is following and the users followed.

Lastly the user is able to create her own lists of users, where tweets from these users are grouped on separate timelines.

▪ **Social Mechanisms**

Social mechanisms allow the user to interact with other users. Probably the most important one is the Follow mechanism which allows the user to select other users that are of interest to her. On a basic level this means that the tweets from followed users will show up on a user's timeline. Of course this also provides information to Twitter on which they can base their advertising. The Follow mechanism is also very unique to Twitter in the way that there is no maximum number of accounts a user can follow and the user followed does not have to "follow back" or accept any sort of request. This allows for users to have asymmetric relationships with other users. This has a couple of interesting side effects as for example it is very easy for the average user to engage with users they do not know personally as famous actors or politicians. Twitter also provides a list of recommendations on who to follow based on the accounts a user already follows. This is another place where Twitter is able to place advertising in form of "Promoted Accounts" (see the section Advertisers on Twitter).

There are also a number of ways a user can interact with tweets from others. These actions can directly be accessed in the timeline of tweets. The first one is the @reply function which allows the user to reply to the original creator of the tweet and therefore start a conversation. A user does not have to follow another user to reply to a tweet of hers.

Another important feature is the Retweet feature that allows a user to redistribute the original tweet to the user's own followers.

The Favorite function allows a user to show her appreciation for a tweet.

A user can also mention other users by using the @-symbol in front of the user's Twitter handle (her name on Twitter). While regular tweets, favorites, replies and mentions are public a user can also send a private message to another user. In this case it is, however, necessary that the users follow each other.

If a user wants to have all of her tweets private she can also choose to only use Protected Tweets, a feature that allows only the followers of the users to see her tweets and additionally she has to accept people who want to follow her.

Although it is not mentioned in the annual report it is also possible for Twitter users to block or mute another user. Tweets by a muted user will no longer be shown to the muting user while if a user blocks another user the user is additionally prevented from following the initial user.

As mentioned one of the core things to understand about the social interaction on Twitter is that users are free to choose whom to follow and whom to message. This is possible due to Twitter allowing for asymmetric relationships (a user does not have to follow back or accept to be followed by other users unless she uses the protected tweets feature as described above).

▪ **Discovery Mechanisms**

These features allow users to discover popular trends and what other people are thinking on topics they are interested in. The main feature to see what is discussed on Twitter at the moment

is called the Trend function. Twitter detects which topics are being discussed heavily on Twitter and show the keywords for users to click on them and have tweets displayed concerning the trend. Oftentimes a hash (#) character is put before an important keyword (called a hashtag) to mark a tweet to belong to a certain topic.

Another feature is a classic search feature that allows a user to search for tweets or people related to a specific topic.

Twitter also features a tool which shows the user topics that might be interesting for her based on the accounts she follows and her tweets as well as other actions.

- **Other Features for the General User Base**

Other, less iconic and unique, features include the possibility to get notifications about certain events. Also Twitter is available on several different platforms. There are mobile applications for nearly every mobile operating system as well as a desktop application called TweetDeck enabling users to watch several Twitter streams at once. It is even possible to use Twitter via SMS. Additionally there is a Twitter application to discover new music based on tweets. Twitter is trying to add new product features from time to time to increase user engagement on their platform. An example would be their acquisition of Vine which is a mobile application that allows users to create looping videos of up to a length of six seconds.

3.1.1.2 Platform Partners

Platform partners can in fact be seen as a subgroup of the general user base. They are usually some sort of content creators. Probably one of the examples for a platform partner that is easiest to understand is a big media outlet like the BBC. In fact most of the world's big media outlet use Twitter as a tool to further distribute their content. Twitter is trying to provide their partners

several tools to enhance their online representation. These tools revolve around integration of tweets onto other websites or applications as well as the attachment of content and functionality of tweets.

Platform partners do not create revenue for Twitter directly, instead the aim is to have them enhance the experience for users and give them more reasons to use the platform and engage with content provided by platform partners as well as other users.

3.1.1.3 Advertisers on Twitter

The advertisers are a crucial group for Twitter's business model simply because the overwhelming majority of the revenue is generated through advertising. There are three products tailored for advertisers:

- **Promoted Tweets**

This special sort of tweet appears in a user's timeline like a normal tweet created by one of the people the user follows. The tweets are labeled as promoted tweets and will show regardless of the device. In addition Twitter uses algorithms to match the user's interest with the promoted tweets shown to them. Crucially the user does not have to follow the advertiser's Twitter account in order to have the promoted tweet shown on her timeline.

- **Promoted Accounts**

As with the promoted tweets these accounts are matched by Twitter to fit the interests of the users. Promoted accounts are labeled as promoted and are shown among the accounts that are recommended for the user to follow based on the accounts the user follows already as well as the tweets they interacted with or created.

▪ **Promoted Trends**

As with the other products for advertisers promoted trends are labeled as such. They are displayed among the trends for a region. The promoted trends can be targeted at a specific region or globally. Promoted trends are also linked to a promoted tweet by the advertiser and are limited to one promoted trend per day per region.

Most of the advertising done on Twitter is pay-for-performance, meaning that the advertisers are only paying if the users are engaging with the advertising. This is defined differently for each promoted product but for example if a user replies to a promoted tweet it would count as an engaged advertising. Because of this payment structure, which is quite standard on the internet advertising market, it is crucial for Twitter to match the advertising with the interest from the user it is displayed to. Therefore Twitter allows advertisers to target users based on several different factors. These factors include the interest of the user which Twitter tries to estimate from the accounts the user is following and the way she is interacting on the platform. It is also possible to target gender, geographic regions, specific keywords or specific devices. Twitter tries to be innovative in this segment for example with the offer of “Television Conversation Targeting”. Twitter analyzes if a user has tweeted about television shows and displays ads that are matching the TV advertising spots shown during these shows. Lastly Twitter also offers advertisers different ways to monitor the advertising campaigns they are launching on Twitter.

3.1.1.4 Data Partners

Data Partners are the second source of revenue for Twitter, however, on a far smaller scale. This business is not really part of the main business model of Twitter and involves subscription

based access to data on user behavior on Twitter. It is also interesting to note that Twitter gives away some of the user data on Twitter for no charge.

3.1.2 Competition

Twitter is competing mainly on three resources. These resources are users, advertisers and personnel. When looking at the first two it becomes obvious that finding a direct competitor for Twitter's business is relatively hard.

The competition for users might be the toughest one while simultaneously being the most important one. Twitter is competing with a variety of firms on the internet that try to attract and engage user bases. Examples include the social network Facebook (including Instagram) as well as the search engines Google and Yahoo! or the professional social networking site LinkedIn. These companies in general have larger user bases and greater financial resources mostly due to being longer in the market. There is also competition from Asian companies like the messenger applications LINE and Kakao or the Chinese micro-blogging platform Sina Weibo which are smaller but still have to be treated seriously. The mentioned competition for users include online social networks, search engines or messaging applications already showing that competition for Twitter comes from a variety of business backgrounds.

The second dimension for competition is advertising or more specifically advertiser spend. Since the majority of revenue generated by Twitter comes from the sale of advertising products it is of high importance to establish Twitter as a standard advertising platform to secure a share of the total amount of money spent on advertising. The competition on this dimension includes

online competitors like the aforementioned Facebook and Google as well as traditional media outlets including television, radio or print.

The final dimension for competition is skilled personnel which is a given in any technical firm. It is hard if not impossible to be a serious competitor in the other dimensions without skilled personnel. This factor gets intensified by the location of Twitter's headquarters in the San Francisco Bay Area where there are many other businesses in similar markets as Twitter and therefor competing in the same pool of people to grow their business.

As a conclusion on this competition overview it can be stated that Twitter is competing with many different traditional and non-traditional businesses, which makes it hard to find similar firms to compare Twitter to. This is certainly a factor when trying to perform a relative valuation on the business and will be discussed in section 4 of this thesis.

3.1.3 Business Risks

While Twitter, due to the nature of annual reports, list a large number of potential risks, this section will focus on those risks that help to understand the market they are in as well as the business model chosen.

A core risk for Twitter is that the size of the user base and the level of engagement by users could decline in the future. As will be discussed in later parts of this thesis the user base might be the most important asset Twitter has and its size and quality in terms of engagement levels are crucial for the success of the business. The user base could shrink if the content created by other users as well as platform partners is no longer interesting for them or if Twitter shows

them too much advertising. Of course also a number of other factors will play a role in the growth or decline of the user base and it is crucial to monitor and improve general engagement on the platform as well as engagement with advertising for Twitter to be successful.

A risk tied to the user base is the risk of losing advertising revenue. Since more than 80 % of Twitter's revenue is generated by the sale of promoted products it is crucial to keep being an interesting platform for advertisers in order to generate revenues. Advertisers typically have no long-term commitments with advertising platforms like Twitter which adds additional risk in this dimension. Also the cost per ad engagement has been declining in the online advertising industry in the last couple of years leading to lower revenues for the same amount of advertising sold. This is a worrying trend especially since Twitter cannot increase the advertising per user indefinitely because of the risk of losing users.

Among the risks for investors the unpredictability of the business also has to be mentioned. Twitter has a limited operating history and due to the fast evolving industry the historical numbers are no reliable estimation of future performance. Twitter's business is also highly volatile and up until now Twitter operates with an operating loss. In addition some of the key metrics Twitter uses to measure its business are based on assumptions and estimates. An example for this are the number of spam accounts among the active user base which often can only be estimated. According to an internal review from Twitter in 2013 these account for less than 5% of the monthly active users.

The technical factors are always an origin of risk that has to be pointed out when talking about internet or mobile based companies. If something in the back-end of Twitter's operations goes wrong and part of the service is not accessible this would result in losses in advertising revenue

since most of it is based on pay-per-performance models. Also users might be unhappy with the service and leave the platform. This is especially relevant if Twitter continues to grow significantly which, again, is a challenge for any online based service. Twitter has to be able to be accessed by the growing variety of different devices in order to stay relevant.

Lastly Twitter has added another layer of risk to its business with its international expansion. One of the risks to be considered are legislation issues which can also happen in the US but are more likely in other parts of the world. Twitter is a quite difficult business to understand and is not appreciated everywhere. An example would be China where access to Twitter is restricted because of government regulation. Another issue that revolves from internationalization is the differences in advertising markets. This might be true for advertisers who need different amounts of time to accept new advertising platforms but also users who are not used to certain styles of advertisements and might react differently. A fact highlighting this issue is that in the three months ending December 2013 78% of the average monthly active users were based outside of the United States but international revenue only accounted for 27% of the consolidated revenue over the same period. Twitter will have to adapt to local differences in advertising preferences in order to scale their international business successfully.

While there are certainly many more risks than can be considered when talking about Twitter's business model the aforementioned ones should give an understanding on where the crucial factors lie that Twitter needs to consider in order to be successful.

3.1.4 Concluding Thoughts on Twitter's Business Model

As a conclusion on Twitter's business model it can be stated that Twitter has found an interesting product combination for its different user bases. It, however, faces strong competition partly from industry players with longstanding history and much greater financial resources. Also the industry or industries Twitter is operating in are a very unstable and rapidly evolving environment with many risks to consider.

3.2 Twitter in Numbers

As with most young companies the short financial history of Twitter provides limited insights into the potential future developments of the company. Another issue in terms of finding financial information on Twitter is that the company has only gone public on November 7, 2013. This leads to the annual report of 2013 being the first and at the time of this thesis only public annual report of the company. The aim of this section is to provide some insights into the financials of the company as reported in the annual report 2013. Also non-GAAP financial measures provided by the company are not discussed in this section.

As one key measure monthly active users (or MAU) are presented. These MAUs are the most important indicator of the growth and activity of the Twitter user base. Figure 2 shows the worldwide development of the user base in millions since March 2011 peaking in December 2013 at 241 million.

Monthly Active Users: Worldwide

(quarterly average in millions)

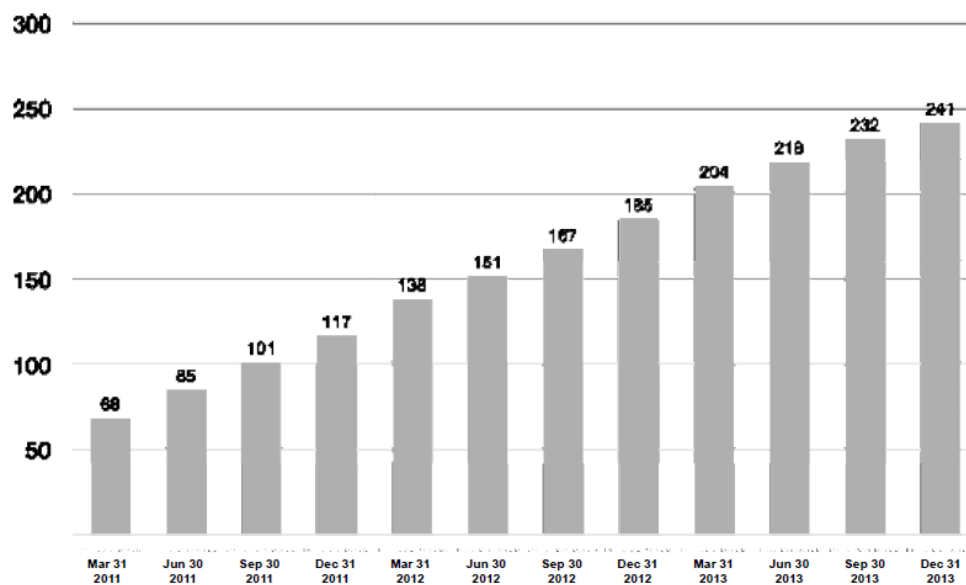


Figure 2: Historical Development of Monthly Active Users (Source: Twitter 2013)

This growth in the user base of Twitter has continued during the year 2014 with Twitter citing 284 million MAUs in January, 2015. (Twitter 2015)

In terms of financial data the situation could be described as characteristic for a young high-tech company. Revenues have been consistently growing at very high rates but so have costs leading to a persistent loss from operations as well as an overall loss of the company. A part of the statement of operations (cut off after net loss excluding information on stockholders and per-share basis as well as pro-forma accounting measures) for the years 2010 to 2013 is shown in Table 1 below. Other characteristic features of the financial indicators include the high cost for research and development which include salaries for the engineering personnel and the high amount of sales and marketing expenses necessary to achieve the growth needed for the company to be successful.

Table 1: Excerpt from the Consolidated Statement of Operations (Source: Twitter 2013)

	2013	Year Ended December 31,		2010
		2012	2011	
	(In thousands, except per share data)			
Consolidated Statement of Operations Data:				
Revenue	\$ 664,890	\$ 316,933	\$ 106,313	\$ 28,278
Costs and expenses ⁽¹⁾				
Cost of revenue	266,718	128,768	61,803	43,168
Research and development.....	593,992	119,004	80,176	29,348
Sales and marketing.....	316,216	86,551	25,988	6,289
General and administrative.....	123,795	59,693	65,757	16,952
Total costs and expenses.....	1,300,721	394,016	233,724	95,757
Loss from operations	(635,831)	(77,083)	(127,411)	(67,479)
Interest income (expense), net.....	(6,860)	(2,486)	(805)	55
Other income (expense), net.....	(4,455)	399	(1,530)	(117)
Loss before income taxes	(647,146)	(79,170)	(129,746)	(67,541)
Provision (benefit) for income taxes	(1,823)	229	(1,444)	(217)
Net loss.....	<u>\$ (645,323)</u>	<u>\$ (79,399)</u>	<u>\$ (128,302)</u>	<u>\$ (67,324)</u>

Table 2, also taken from the annual report, lists the revenue components and the costs in percentage of the revenues. Among the information most interesting to consider from this is the rising importance and focus of the company on advertising services as their main source of income. The portion of advertising revenue as compared to other revenue sources (mostly data licensing) has steadily been rising over the last years peaking in 2013 with 89% of revenue. Two other important lines in terms of their impact are the costs of research and development as well as the costs for sales and marketing. Both increased disproportionately in 2013 as compared to 2012. This is explained by the management to be due to personnel costs of stock-based compensation triggered by the company's initial public offering.

Table 2: Consolidated Statement of Operations Data as Percentage of Revenue (Source: Twitter 2013)

	Year Ended December 31,		
	2013	2012	2011
Revenue			
Advertising services	89%	85%	73%
Data licensing and other	11	15	27
Total Revenue	100	100	100
Costs and expenses			
Cost of revenue	40	41	58
Research and development	89	38	75
Sales and marketing	48	27	24
General and administrative	19	19	62
Total costs and expenses	196	124	220
Loss from operations	(96)	(24)	(120)
Interest income (expense), net	(1)	(1)	(1)
Other income (expense), net	(1)	0	(1)
Loss before income taxes	(97)	(25)	(122)
Provision (benefit) for income taxes	(0)	0	(1)
Net loss	(97)%	(25)%	(121)%

Lastly the consolidated balance sheet from the annual report is shown in Table 3 below. Again there are characteristics for the industry Twitter is working in. High working capital as well as cash and short-term investments are paired with low net property and equipment. This is common for high-technology firms. On the liability side it is easy to spot the drastic change that the initial public offering in the end of 2013 had on the stockholder's equity and the convertible preferred stock.

Table 3: Consolidated Balance Sheet Data from 2010 to 2013 (Source: Twitter 2013)

	As of December 31,			
	2013	2012	2011	2010
	(In thousands)			
Consolidated Balance Sheet Data:				
Cash and cash equivalents	\$ 841,010	\$ 203,328	\$ 218,996	\$ 134,253
Short-term investments	1,393,044	221,528	330,543	43,484
Working capital	2,349,249	444,587	548,324	167,088
Property and equipment, net	332,662	185,574	61,983	26,385
Total assets	3,366,240	831,568	720,675	224,473
Total liabilities	416,234	207,204	87,391	35,432
Redeemable convertible preferred stock	-	37,106	49	-
Convertible preferred stock	-	835,430	835,073	279,534
Total stockholders' equity (deficit)	2,950,006	(248,172)	(201,838)	(90,493)

In their commentary on the financial statement data and the overall state of the company the management also provides specific data such as the timeline views per user or the advertising revenue per timeline. While interesting, especially when comparing Twitter to other firms in the online advertising market, these numbers do help little to help an analyst to understand the value drivers of the companies and are therefore not included in this section.

As a conclusion to this section it can be stated that Twitter's financial statements sport many of the characteristics of young high-tech companies. The missing profits even with large growth in the user base and the revenues as well as the asset structure of the company have been mentioned in this regard. Also the breakdown on costs and revenues is important to consider. It seems clear that the focus of the company in terms of revenue will be the advertising business, which has to be taken into account when analysing the business model. In terms of costs 2013 is a year from which it is difficult to draw conclusions for the future from. This is due to the massive effects of the initial public offering that are distorting the financial statement information. Since these costs are of a one-off nature the structure of costs should not be used to draw conclusions regarding the upcoming years for obvious reasons.

4 The Difficulties of Classic Valuation Approaches

This section aims to briefly describe the most used valuation techniques in asset valuation. In general most of the valuation techniques used by practitioners and in academics are tailored to value mature companies in somewhat known and therefore predictable industries. In part because of this classic valuation methods will have several problems when valuing a company like Twitter. These difficulties of the various valuation methods are also discussed and serve as an additional motivation to discuss non-standard value drivers.

4.1 The Discounted Cash Flow Valuation

The discounted cash flow (DCF) method of valuation is by far the most important and renowned method for equity valuation. The method has several features that make it applicable in a wide area of valuation areas or as Koller et al. (2005) put it:

“Discounted cash flow analysis is the most accurate and flexible method for valuing projects, divisions and companies” (Koller, Goedhart, and David 2005, 371)

In addition to its accuracy and flexibility it is also intuitive to understand. In the following the method's framework will briefly be described and the problems of valuing Twitter using the method will be discussed.

4.1.1 Methodology Overview

The basis of the method lie with the idea of present value. This idea states that *“the value of any asset is the present value of expected future cash flows on it”* (Damodaran 2012, 11). The

expected future cash flows are discounted at a rate that reflects the risk of the cash flow and are then summarized to add up to the value of the asset. Cash flows can represent different things when valuing different assets, they may be dividend payments of a stock or after-tax cash flows when valuing a real project. While there are many different variants of the DCF method, the system of valuation stays the same, which makes the framework so flexible. However the result of the valuation will only be as good as the components of the method which will be described in the following. (Damodaran 2012)

4.1.1.1 The Free Cash Flow

It is important to ensure that the used expected cash flow matches the used discount rate when valuing an asset. In the case of firm valuation (as opposed to equity valuation) the free cash flow is used. This cash flow represents all cash flows from assets without deducting the payments made to debt holders but after the reinvestments in assets of the firm has taken place. In other words the free cash flow is the cash flow to all claimholders of the firm. (Damodaran 2012, 13)

4.1.1.2 The Discount Rate

The projected free cash flows are discounted for time and risk. In order to do this the appropriate discount rate has to be chosen. In the case of free cash flows this is the weighted average cost of capital (WACC). For a company financed by debt and equity the WACC is the sum of the cost of debt and the cost of equity weighted by the respective fractions of debt and equity making up the company's capital structure. The cost of debt is hereby also diminished by the so-called tax shield which arises because debt payments are tax-deductible. The resulting

WACC represents the risk for all investors in the companies (both debt and equity investors). (Koller, Goedhart, and David 2005, 113)

4.1.1.3 The Terminal Value

Usually a DCF valuation is done in two steps. First, for an explicit forecast period of a number of years into the future, expected cash flows are projected. For the years during this period the forecasts are very detailed leading into a second period. This period is essentially from the ending of the explicit forecast period until the end of time. For this period the firm is valued using some formula for a continuing value. By nature (because the time period is infinite) the growth rate of the cash flows in this formula has a huge influence on the valuation and generally most of the total firm value comes from the terminal value. (Koller, Goedhart, and David 2005)

4.1.2 The Discounted Cash Flow Valuation Method and Twitter

Even though the DCF valuation can be used to value a company like Twitter there are several complications that need to be considered. Still, Koller et al. (2005) claim it is the best method to value high-growth companies although they admit the difficulties. They suggest using a scenario-based DCF model that takes into account the possible developments of the industry and weights by their probability of occurring. (Koller, Goedhart, and David 2005)

The main problem the DCF has with Twitter (and similar firms) as a company to value is that it is very difficult to get the components of a sound valuation model. Historic performance is often looked at to get a feeling what a company could look like in the future and while this approach works well with established businesses it fails with young, high-growth companies

like Twitter. The cash flows are oftentimes still negative and the massive growth some of the key measures are experiencing are in general not sustainable. This leads to great difficulties when estimating the future cash flows and it does not get much better when analyzing the other two components of the valuation. To get a sensible discount factor one has to estimate the risk of the company's cash flows. This is usually done by using a capital market model like the capital asset pricing model (CAPM) and looking at comparable firms in the industry. Once again an analyst will have difficulties when valuing Twitter as is hard to find good comparable firms (which is the case in many valuations) and the risk of the industry is relatively unknown, since it is so new. Lastly the terminal value offers its own peculiarities in such a valuation. When a firm is not profitable, to have a positive firm value it has to be the analysts forecast that it will be profitable (again) in the future. This can lead to the case where more than 100 percent of the firm's value is in the continuing value after the forecast period. In the case of a firm where the industry is too new to have a solid understanding and growth rates are definitely not going to be sustainable for the infinite time period of the terminal value this leads to problems. With the terminal value being notoriously sensitive to its input factors even in classic valuations of mature companies the task to estimate a sensible terminal value definitely has its peculiarities for high-growth, non-profitable firms. These points also hold in case of the scenario-based DCF proposed by Koller et al. (2005). While this adaption to the classic DCF definitely has its merits, creating probable scenarios for an unknown industry is no easy task since there is little information to base those scenarios on.

Summarizing it can be stated that the main difficulties for a valuation of Twitter using a DCF framework arise because of the missing historical data that in itself has very limited use in forecasting due to the early stage of the company, the relative lack of understanding of the industry and the negative profits. Among other possible problems these points lead to the

discounted cash flow valuation being highly dependent on inputs that have to be forecasted on the basis of very little information rendering the whole valuation, in the most dramatic case, to more of a guess-work than an actual analysis.

4.2 The Relative Valuation and its Downsides

The valuation using multiples is the most often used valuation method in practice. This is most likely due to the ease of use and the intuitive nature of the method. The idea behind it is to take firms that have similar characteristics and are therefore deemed comparable by the analyst. Then a fundamental measure of these comparable firms (for example revenue) is taken and divided through the price of the respective stock (with the example of earnings leading to the price-earnings ratio). When averaging these generated multiples and multiplying them with the fundamental measure of the firm to be valued the analyst can achieve a value of the firm. The averaging of the multiples across the industry is because of differences that occur between the firms and that should be accounted for in this way. This can of course also be done in a more sophisticated way for example by using multivariate regressions and controlling for the relevant variables. An implicit assumption of this method is that the market is right in valuing the other firms. Also because no two firms are exactly the same, there is room for a bias by the analyst. (Damodaran 2012)

Liu et al (2002) did a study to see which multiples do best in explaining the stock prices of companies. They find that revenue multiples perform the best, with one year forward earnings followed by historical earnings leading in terms of accuracy to explain stock prices. Book value based multiples are third in line with sales based multiples performing worst. Their findings are remarkably stable for different industries, however, the authors warn that the findings might

not be representative for all types of firms since their data is selected using relatively strict criteria and therefore excluding a substantial number of firms. (Liu, Nissim, and Thomas 2002)

Different multiples that are used by analysts are earnings based, book value multiples or revenue and sector-based multiples. (Damodaran 2012) All three of these multiples, however, are difficult to use when valuing Twitter. Earnings multiples, while being the most reliable and therefore most popular multiples, cannot be used since Twitter is reporting negative earnings. Book value based multiples can be used, however, it is not optimal to value technology companies by the book value of their assets since most of the value of these companies comes from assets that do not show in book values. These are assets like the brand, the customer base or patents. Lastly revenue and sector specific multiples are often used to value companies that are hard to value otherwise. The problem with these multiples are that revenues are generally no good indication of a firm's value without any information on the profitability, which again in turn leads to the problem of negative earnings. Sector specific multiples that use an important measure in an industry might be an interesting way to go but they offer no value if the sector itself is over- or undervalued. In a discussion that is partly motivated by the dotcom era it is hard to argue for multiples that are specific to a sector that in the past undergone such dramatic price corrections. Additionally the problems of finding comparable firms is very relevant in our case. Since Twitter has built its own market of microblogging that it now dominates there are no real competitors in terms of exact product offer and size. It requires a deeper understanding of the value drivers important for Twitter to be able to find competitors where the simple search for other microblogging companies simply returns nothing. And even then, once a competitor that has similar value drivers is found, there is still the problematic of different services of the competing companies which might be subject to different general trends in the market.

While multiple valuation is often used to great effect to measure a company's value there are problems when trying to value Twitter using this method. Firstly the most popular multiples cannot be used because of the negative earnings (price-earnings multiple) and the nature of the company (book-value multiples). The other multiples used in practice have their individual flaws which mostly disqualifies them for this specific use (for example sales multiples with no regard of profit margins). Secondly the sector specific multiples that are often used in very distinct markets are hard to argue in favor of because of the huge corrections the internet sector has already undergone during the dotcom era.

5 Understanding Twitter

Since Twitter is a relatively innovative service there is some discussion on how to categorize it in the business environment. While it most definitely has many features of a social network, Twitter is also unique in the way it distributes news. Also, because Twitter has changed in the past and will most probably will change in the future it is hard to find a definitive answer. This section looks at Twitter from a general point of view followed by the two different viewpoints of a social networking site and a two-sided market with a summary of the implications for value drivers in either case.

To understand Twitter it is crucial to also understand the basics of online advertising. Evans (2009) explains how online advertising started in 1994 with the web magazine HotWired selling a banner ad to AT&T displaying the banner on its website. The first banner ads were paid for using a so-called CPM model, which stands for cost by mille. This means that the advertiser is charged a certain amount for every thousand impressions (users visiting the website and therefore seeing the ad). Later on the CPC model was introduced which nowadays co-exists with the CPM model. CPC stands for cost by click where the advertiser only pays a defined amount if a user clicks on the ad. Since its inception online advertising has continued to grow in part because of the characteristic of this medium of both the CPM and the CPC model allowing the advertiser to have some performance-based costs. This means that the advertiser only pays to the amount the ad was seen (CPM) or even only if a user engages with the ad (CPC). Additionally online ads can be targeted to user groups based on the context of the content they are shown with (for example ads can be shown on business or health related sites) and advertisers are able to exactly time when ads should be displayed. These facts help the advertising industry's quest to provide efficient matching between consumers and advertising.

Of course this targeting of users is also the topic of many discussions regarding privacy matters. (Evans 2009)

Van Dijck (2011) considered the first years of Twitter from 2006 to 2010 to analyze how the initial platform changed through the time of uncertainty regarding the offer of micro-blogging as well as the influence of business models and individuals. He argues that even though Twitter has become a strong global brand the meaning of micro-blogging as a service is still not decided on yet but rather might be subject to change in the future. Twitter was described initially as the “SMS of the Internet” since it started off as a technology to send and receive messages limited to 140 characters. Somewhere in-between a blog and an email. The iconic 140 character limit also stems from these beginning years since Twitter wanted to maintain compatibility with mobile phones. Van Dijck argues that this “*hardware versatility*” has been one of the success factors for Twitter. There was an ongoing discussion in Twitter’s early years about the use of its offer. Researchers were unsure about why people used Twitter and tried to connect different academic concepts to it. Twitter made efforts to be compatible with as many other services as possible. It made sure that Twitter’s services were compatible with social networking sites like Facebook, search engines like Google or classic news outlets on the web. The early vision of Twitter was to provide an open tool everyone could use. During the first five years Twitter managed to become a mediated social practice in several areas. The term social practice describes everyday activities like talking with friends or gathering information about the world which are routinely undertaken by people. Once these activities are linked to a certain technology or tool one speaks of mediated social practices. Van Dijck gives talking with friends over the phone as an example. Due to Twitter’s open design it competed with many different forms of information and media sharing as well as communication tools. On Twitter it is possible to communicate with a lot of people to have a more one-way directed communication

or to have conversations with a limited group of people. Twitter's user interface was changed gradually into the direction of a more "status update" like conversation shifting the way users communicate more into the direction of one user sending a message to a large audience without necessarily expecting a response from every recipient. While other ways of communication still stay possible (for example there is still the feature of private messages (Twitter 2013)) this mode of communication clearly evolved over time as the mode Twitter promotes through its interface. This focus on sharing of news and one-way communication changed the users' behavior in this direction. Like the use of the term "googling" for most of the search done on the internet "tweeting" has become synonymous with the act of microblogging which is the ideal case for a new mediated social practice competing with existing ones. An example of how Twitter changed its focus from a conversational platform to a more news-oriented one can be found by the message Twitter greets users with and which should motivate them to generate a tweet via the user interface. At launch this message was "*What are you doing?*" which was changed in November 2009 to "*What's happening?*". While this change certainly is very subtle it leads away from a more personal focus to a focus concerning the events happening in the user's surroundings. Similar to these changes in the way the platform is "intended" to be used the business model of Twitter has also evolved over time. For a large part of its early years Twitter kept financial analysts and researchers guessing what kind of business model they would choose. The company experimented with several different models from subscription and fee based models to iterations of today's advertising based models. The decisions towards this direction has been taken very seriously and implementations were done step-by-step, always having in mind that if a user did not like seeing promoted tweets on his timeline, there was a possibility for her to quit Twitter altogether. (Van Dijck 2011)

Another point of view on Twitter's early years is presented by Arceneaux and Schmitz Weiss. (2010). The authors analyze the press coverage of Twitter's beginnings and compare them to the coverage of other innovations in communication technology. The early coverage was not consistently positive. Many questioned the use of Twitter's product and the fact that Twitter operated its first couple of years without a defined business model did not help the case. The service mostly gained positive recognition by breaking the news on several worldwide events (including earthquakes, political protests or terrorist attacks) faster than any other medium by Twitter users experiencing the events on site. The authors used prior literature concerning the coverage on the introduction of technologies as the telegraph, the telephone or television to analyze Twitter's splash in the media environment. The most reoccurring theme in the early coverage was not surprisingly the explanation of the service in general. Overall the media coverage was still mostly positive with some negative articles surfacing due to problems associated with the growth of the platform (mostly the misuse of the platform through spamming, the difficulty of following many different accounts and the missing business model). According to the researchers these are patterns similar to great innovations in communication technology such as the radio or the telephone. (Arceneaux and Schmitz Weiss 2010)

A reoccurring theme in the early coverage of Twitter from both the media and the academic literature was the missing business model. Twitter was founded in early 2006 as a free service and did not specify a business model until approximately the end of 2009. Smith (2009) was one of the authors analyzing this phenomenon. Contrary to others he talks in a positive manner about the freedom Twitter has because of its lacking business model. In his blog post he mentions eight different ways how Twitter could monetize its service. Most of them did not happen to be used by Twitter, although he did also mention what he calls "birds of a feather" targeting (finding a group of people with interest matching what a company wants and

expanding the target audience from there). Smith believes that there is much people can learn from a company without a set business model. (Smith 2009)

5.1 Twitter as a Social Network

5.1.1 Virtual Social Networks

Twitter is often named in the same notion as Facebook and other social networking websites on the internet. The company itself counts websites like LinkedIn and Facebook among their fiercest competitors in its annual report (Twitter 2013). This leads to the question if Twitter is a social network itself or, if not, one can find value drivers that are important to the success of social networking sites and derive implications regarding Twitter. To classify Twitter as a social network or dismiss this possibility it is necessary to understand what a social network is or more specifically what a web-based or virtual social network is characterized by. Due to the success of virtual social networks in the last years the topic has come up in several ways in the literature and researchers from many different backgrounds are interested in the phenomenon of this new kind of social networks.

According to the taxonomy of Musial and Kazienko (2012) such virtual communities can be found or are maintained by either a specific networking platform like Twitter, Facebook or LinkedIn or the community can be indirectly traced by looking at user interaction and activities like emails, chats or blogs. Naturally for this thesis the former representation of an online community is of interest. The relationship between users on the internet can take many forms and are different in several aspects when compared to real-live social networks. Because of their complexity there is not a single classification of online social networks, in fact, there is

not even a single name that has emerged from the literature to describe this phenomenon. Authors use, among other terms, computer-supported social networks (CSSN), web communities or web-based social networks. Each author uses her own definition of the network type she is analyzing. The definition of a web-based social network represents the definition most fitting for Twitter and other social networking platforms because it requires the explicit action of users connecting and a platform that is able to provide the infrastructure for such a connection essentially limiting the definition to social networking sites. The authors further suggest a taxonomy of internet relationships (see Figure 4). (Musiał and Kazienko 2012)

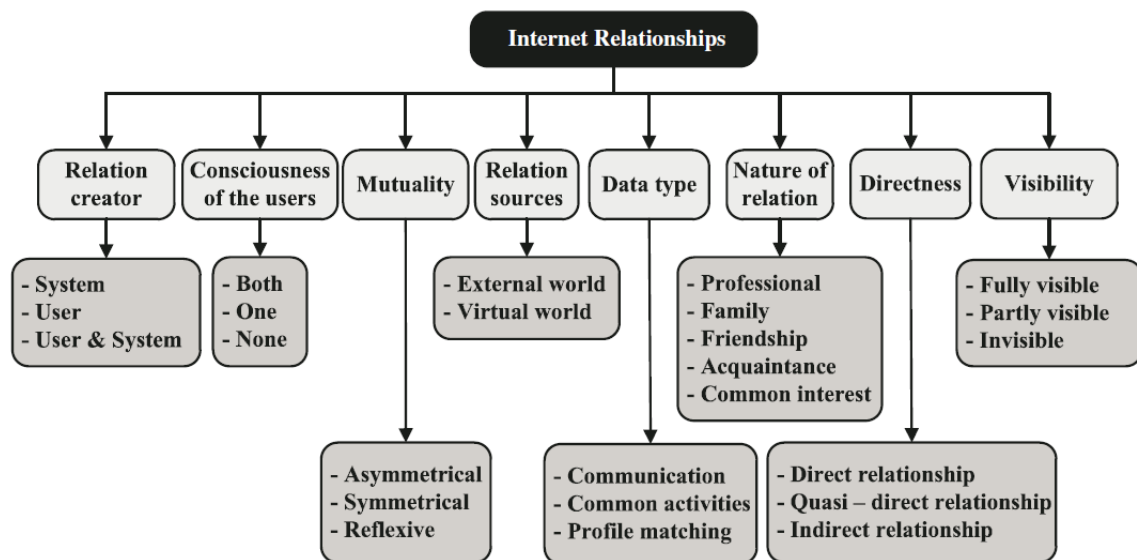


Figure 3: Taxonomy of Internet Relationships (Source: Musiał and Kazienko 2012)

Musiał and Kazienko use eight dimensions to classify user relationships. The first dimension describes how the user connection is created. This can either be done by the user herself when adding someone to her network or by the system by automatically connecting different users (for example on base of their profiles). The mixed case occurs when the system initiates the relationship by suggesting different users but the user herself has to confirm the relationship. In this case the relationship is initiated by the system but without the user's approval no connection will be created.

The second classification dimension covers the fact if one or both users that share a connection are also aware of this connection. Connections where neither user is aware of the connection are usually initiated by the system. In case the majority of the connections are ones where the users are not aware of it the network has generally a lower chance to survive than when users are made aware.

Thirdly online relationships can be differentiated via their direction or mutuality. Because in most social networks there is data regarding this category it is one of the most used ones to categorize internet relationships. There can be mutual (symmetrical), asymmetrical or reflexive (a user has a relationship with herself) types of relationships.

The fourth category, the source of a dimension, is usually very hard to measure. It tells if the relationship has its roots in the real world or if the relationship started exclusively online.

The data used to create the relationship, the fifth dimension mentioned, can consist of common interests, profile matching by the system or common activities on the web to name examples. This information is often not very useful for analysis though.

Another dimension that is particularly hard to measure is the nature of the relationship. A relationship can be professional, a family relationship, an acquaintance or a relationship based on common interest among others. It is very hard to describe all possible relationships and two users can have several relationships of different nature. These “bundles” of relationships are termed “ties” by the authors.

The directness of a relationship is an original concept by the authors. They distinguish between direct, quasi-direct and indirect relationships depending on the contact between the users. Direct relationship usually require communication between the users while quasi-direct relationships are formed by communicating via a medium between the two users. For example two users comment on the picture or attend the same meeting discussing a given topic. Indirect relationships are when users are unaware that there are other users with similar features.

Lastly a relationship can be described by its visibility. This category can usually be set by the users given the privacy options the chosen social networking platform allows. Another example would also be when users include other users in an email exchange via blind copy so that they are not visible to the recipients of the mail.

While some of these categories are hard to measure or very subjective and oftentimes hard to interpret, a relationship can be well described when giving each dimension a value. This leads to a comprehensive view that is not possible when describing relationships on the internet only with a couple of dimensions. (Musiał and Kazienko 2012)

In terms of Twitter the proposed relationship taxonomy can be used to gain further understanding of the workings of the platform and to help distinguish Twitter from competing social networks. Relationships are created by the user herself and can be based on suggestions by Twitter which does not form relationships without the consent of the user. Both users are made aware of their connection although the connection does not have to be symmetrical. Indeed it is the standard case for Twitter relationships to be asymmetrical with one user following another user who is not “following back”. The relationship source, the data type as well as the nature of the relationship are not distinct features of Twitter relationships because Twitter does not restrict these dimensions. It is possible to have relationships of all different kinds of value combinations in these three dimensions. In general Twitter relationships are direct, however, there could be a case made for indirect relationships when users are made out by the system to be similar (for example to search for suggestions) and for quasi-direct relationships when two users reply to the same tweet of a third user. The concept of directness does not add much value to the discussion of Twitter’s valuation, however, and is therefore not of great interest in this setting. All relationships on Twitter are visible. The dimensions that differentiate Twitter from other social networking sites are mostly the mutuality and the nature

of the relationship. Twitter supports asymmetrical relationships which differs from the concept of websites like Facebook where relationships between users are symmetrical for the most part (a case can be made here for company sites on Facebook which also sport asymmetrical relationships but do not represent the core user base). Also the nature of the user relationship is not driven by the nature of Twitter which differentiates it from specialized sites like LinkedIn where professional relationships are the most commonly found.

The taxonomy by Musiał and Kazienko (2012) is applicable to a very broad definition of social networks on the internet. The subgroup most interesting for the purpose of this thesis is the one of Social Networking Sites (SNS)”. These sites go by several different names but the core definition is usually based on their main goal being the creation and maintenance as well as the presentation of relationships between its users. Musiał and Kazienko name Facebook, MySpace and LinkedIn as typical examples. One aspect typical for these sites is that communication is possible through several different channels. Generally users start participating on a SNS by completing a registration process including setting up a profile with personal data. Which kind of data is necessary or usual for a SNS is very different for each SNS. The sites are generally distinguished by their target audience. Examples would be Facebook targeting a broad, general user base while LinkedIn is focused on professionals. (Musiał and Kazienko 2012)

Other authors approach the taxonomy from the angle of the term “social media”. Vock et al. (2013) for example describe social media as an umbrella term for many different kinds of web pages including social networking sites, content driven sites (to which the authors count Twitter), collaborative projects like Wikipedia or virtual gaming environments (Vock, Dolen, and Ruyter 2013).

Ouirdi et al. (2014) try to answer the question “*What are social media?*” to help define the term of social media. The authors use the communication framework of Lasswell which proposes that communication “is best explained by answering the *questions ‘who’, ‘says what’, ‘in which channel’, ‘to whom’ and ‘with what effect’*”. Based on this concept the authors perform a content analysis on the most cited papers concerning social media and try to find a common definition for what according to the literature includes social and professional networking sites, blogs, micro-blogging services, wikis, web sites to share pictures or videos as well as social news and bookmarking and different kinds of forums. Ouirdi et al. then formalize a tentative definition of social media which is summarized in Figure 5. The social media platforms can be categorized based on three dimensions which are graphically represented by a cube. The first dimension (represented on the z-axis of the cube) shows the user, who can be on a micro-, meso- or macrolevel. The content dimension specifies what can be found or shared on the platform (represented on the y-axis). Lastly the function dimension answers the question why users communicate via the platform (represented on the x-axis). (Ouirdi et al. 2014)

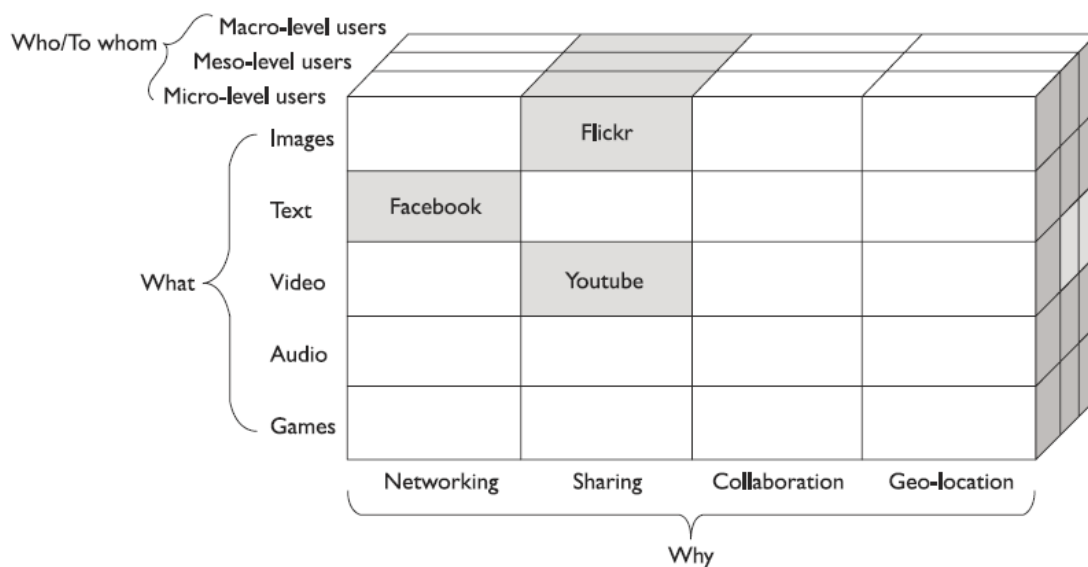


Figure 4: Social Media Cube to Help Classify and Identify Social Media Platforms with Examples (Source: Ouirdi et al. 2014)

One aspect to consider following the taxonomy of social media as shown in Figure 5 taken from Ouiridi et al. (2014) is that the platforms can fill several subcategories on one axis. If one were to fill in Twitter one would have to mark all levels of users as well as all subcategories of content with “Games” being the sole exception. In terms of the means of communication a user can use the platform in all four ways proposed by the authors of the paper. Although Facebook is shown to utilize only one subcategory in the graph it would actually have to fill each and every subcategory provided in the cube. Every level of user is able to communicate in all four stated ways using every form of content mentioned. This leads to a very strong overlapping between the two companies of Twitter and Facebook although Facebook is seen as a social networking site and Twitter is the world’s leading microblogging platform. The main lesson to be learned from this is that even though the two companies are have different foci on their platforms they are still similar enough in other dimensions for an analyst to compare them in different dimensions. This leads to the discussion of the rich literature on social networking sites being relevant in the discussion of Twitter even though Twitter is by itself no social networking site¹.

Heidemann et al. (2012) gave an overview over typical features of online social networks (in contrast to the aforementioned Musial and Kazienko (2012) the authors hereby only focus on websites dedicated to the creation and maintenance of social connections). According to this study the core of an online social network is usually a user’s profile that is filled with information about the user (usually dependent on the general purpose of the social network). These profiles are enriched with the possibilities of linking them (adding others as contacts), sharing content as well as different ways of communication. When trying to find a typical way

¹ It should also be noted that it is possible to use Twitter as a social networking site even though this is not the main focus of the platform.

users utilize an online social network one quickly realizes that this is very dependent on the site. It is very hard to compare social sites like Facebook with professional sites like LinkedIn. One use case that emerges consistently in the literature is the action of “identity management”, meaning the maintenance of one’s own profile information. Another wide-spread motive is the management of contacts to establish or maintain social relationships with other users. A characteristic of the online networks compared to classic social networks is the size. The authors name 10 to 20 close relationships as an average for a traditional social network while an average user of Facebook has 130 so-called friends. In this context some authors distinguish between a social graph showing only the connection with each connection being equally represented or weighted or a activity graph where the relationships are represented with an indication of how strong the ties between two people is based on the amount of activities between them. The authors provide a graph with an overview of the founding dates of a broad selection of online social networks. This graph is shown in Figure 6. Interestingly for the topic of this thesis Twitter is not shown in this timeline. The decision for this is that Twitter is categorized as a content driven firm comparable to Youtube or Flickr by the authors. (Heidemann, Klier, and Probst 2012)

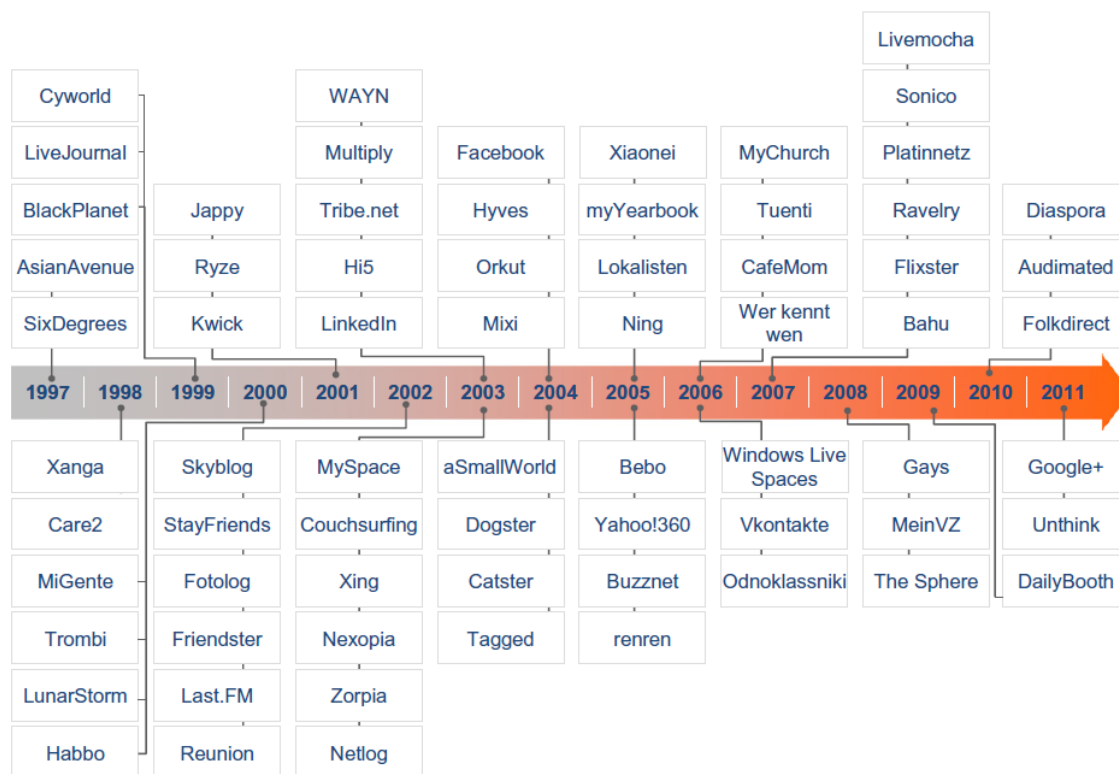


Figure 5: A Timeline of the Foundation of Selected Online Social Networks from 1997 to 2011 (Source: Heidemann, Klier, and Probst 2012)

In terms of categorization of online social networks Heidemann et al. (2012) align the network sites on two axes. The first one is the focus of the website in terms of interests of the user. This ranges from general (Facebook being an example) to special interest which focus on a particular niche and therefor attract a smaller target audience. The second dimension on which one can differentiate online social networks is the distinction between private social networks and networks focused on business (like LinkedIn and Xing). These two dimensions with two values each form four quadrants in which one can categorize every social network according to the definition used by the authors. An example would be the quadrant of a special interest network with a focus on business (with lawysrs.net being an example social network focusing on business opportunities for lawyers). According to the authors online social networks can create value during many different stages of the business cycle such as leveraging R&D, finding new marketing target groups or improving customer service. (Heidemann, Klier, and Probst 2012)

One of the most crucial factors to explain why social networks on the internet are so popular amongst their users is the concept of social ties. This concept from classic networking theory and social network literature helps to explain what value a virtual social network can provide. Granovetter (1973) discusses how valuable different social ties can be with an emphasis on what he calls “weak ties”. In his work a tie is a positive and symmetrical relationship between individuals which of course is not the only form of social ties but the ideas can easily be transferred. The author defines the strength of a tie as a combination of independent but highly correlated measures “*of the amount of time, emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie*”(Granovetter 1973, 3). The author claims that for social networks and communities weak ties are crucial. In fact he argues that for some cases they are even more important than the strong ties an individual has to others. He also acknowledges that to have a full theory of social networks it is not enough to focus only on the strength of social ties since it is also important to consider other characteristics such as the specialisation of a tie or the hierarchy. Nevertheless Granovetter provides important contributions broadening the view that strong ties are the most important factors in social networks to include weak ties and their major influences on social networks. These weak ties are especially important when moving from the analysis of only small groups to trying to find larger social networks with links between several small, tightly-knit groups. (Granovetter 1973)

The fact that weak social ties can have great impact onto the users is one of the factors able to explain the great success of virtual social networks. They provide the tools to simply create and maintain especially these weak ties that have been shown to be of such importance by the literature.

With the success of virtual social networks a question oftentimes asked is the one of the business model of the network. As shown in the introduction to this segment, Twitter is no exception to this with many authors wondering in the beginning years of the company how and if the service will be profitable one day. These questions occur naturally partly because the whole phenomenon of social networks over the internet is new and of course because many of the social networking sites are free of charge, either only in a basic form or the service remains free and is financed through advertising.

Enders et al. (2008) are among the authors trying to find suitable revenue models and value drivers for social networking sites. To describe the success of the websites the authors refer to the Long Tail² concept as to why virtual social networks are partly superior to traditional social networks. In particular this is due to the easier access to weak tie connections on the internet which are more useful than people one has a strong relationship with in certain areas. Online social networks allow a user to build and maintain such relationships more easily. Therefore it is possible for a user of a social networking site to have a social network of a size that is not possible to achieve and maintain via traditional face-to-face networking. The paper is based on the analysis of two German social networks, who were leading European players at the time of the study because of an existing connection between the researchers and the top management. These two networks are the professional networking site Xing and the social networking site Friendster. As value drivers the authors identify the number of users using the service, their willingness to pay for certain products or services as well as the consumer trust on the platform. Consumer trust in the context of the authors describes the trust users have in the platform to

² The Long Tail is a concept created by Chris Anderson and was initially published in the Wired magazine and later on expanded into a book. The concept states that the internet has changed the retail landscape because having infinite inventory is now possible as compared to brick and mortar stores where inventory is related to significant costs. (Anderson 2004)

keep their data safe and the options available to them to limit the access of other users to their data. Enders et al. find three revenue models that are suitable for social networking sites. These are advertising models, subscription models and transaction models. They also find that social networking sites (SNS) often have hybrid revenue models consisting of a combination of the three mentioned models. The authors also link the mentioned models to specific value drivers that are crucial in the success of each revenue model. These findings are summarized in Figure 7. For the sites generating their revenue mostly through advertising, which is the most popular revenue model, it is the number of users on the platform that has to be optimized. Advertising is only possible and sensible if the site is able to attract large amounts of traffic. On the other hand the willingness to pay and the consumer trust are not as important since oftentimes the user is expecting free or very cheap service and is therefore willing to accept a certain level of advertising as the cost. The second model, revenues generated via subscriptions, is naturally very dependent on the service provided and the willingness to pay of the users. When a service is using a subscription model rather than advertising users generally expect high quality of the service. The third revenue model, transaction based models, occur when the platform provider charges a fee for a service the platform itself provides or a third-party service that is offered through the platform. With these models the importance of the number of users and the willingness to pay vary based on the exact transactions that are done via the platform, the trust by the consumers in the platform has to be there in nearly all the cases though. (Enders et al. 2008)

Revenue Model	Revenue Drivers			Implication
	Number of Users	Willingness to Pay	Trust	
Advertising Models				„Lenghten the tail“
Subscription Models				„Fatten the tail“
Transaction Models				„Drive demand down the tail“
 No Impact  Medium Impact  Very High Impact				

Figure 6: Revenue Models, Revenue Drivers and Implications for SNS (Source: Enders et al. 2008)

Figure 7 also relates the different revenue models with the concept of the Long Tail (the column “Implication” of the graphic). Advertising models usually aim to “lengthen the tail” meaning that they strive to generate as many users as possible, not really optimizing for the revenue per user. In contrast the subscription models try to optimize the revenue generated by every user, e.g. try to have as many users have a subscription or have a higher-priced subscription which is described by Enders et al. using the term “fatten the tail”. The transaction based models is a bit of a hybrid form, trying to both get more users to do transactions as well as to have more, larger transactions if possible. (Enders et al. 2008)

Vock et al. (2013) have also conducted a recent study on value drivers of social networking sites. More specifically the authors try to identify the important factors that drive the user’s decision on whether or not to pay for the premium features of a platform by buying a subscription. One of the problems social networking sites are facing is that they cannot easily

control their product like content creators can in terms of for example exclusiveness or freshness. They have to depend on connectivity as a value proposition. The authors introduce entitativity as an important concept in this regard. Entitativity tries to describe the degree to which a group of individuals can be described as one entity. High group entitativity can be based on similarity between members or the sharing of a collective fate. As a second value proposition of online social networks the study focuses on social capital, which is described as the value users can gain by using their relationships and connections to other users as a resource to perform social actions. The study shows that both value propositions influence the willingness to pay of the users. However, these effects can be either direct or indirect and differ with the focus of the social networking site (the authors considered sites with a social focus and ones with a professional one). (Vock, Dolen, and Ruyter 2013).

Because these insights differ with the type of the social network as well and the focus of the study is solely on subscription based models of social networking sites, it is hard to relate the findings to Twitter. The fact that the type of social networking site has an influence on such a fundamental decision of the user as her willingness to pay for the service even though the platforms use similar subscription based revenue models goes to show that one has to be very careful when comparing different social networks or social media platforms.

5.1.2 Valuation of Online Social Networks with Regards to Twitter

As mentioned above one of the major decisions to be made when creating and operating a virtual social network is how to monetize the service. Clemons (2009) offers relatively strong opinions on the problems of advertising through social media. He argues that traditional advertising has less and less impact due to reasons such as diluted audiences on different channels caused by the ever rising possibilities of consuming media or because the consumer

is better informed and trust in advertising is declining. However, the author warns that advertising through social media is most likely not the answer to these developments and he also mentions that according to his point of view the high valuations of electronic social networks is comparable to the dotcom bubble. Several ways of monetization are described and matched against a variety of online networks such as video games, Facebook or Myspace. The main reason given by the author to why advertising in electronic social networks (which are described as social networks without the users' intention to meet in person) is most likely not going to have significant impact is that advertising does not work well in social settings. It is compared to seeing someone trying to sell something at a family gathering. Since actions like that are socially not really accepted the authors does not see a future for advertising in electronic social networks. (Clemons 2009)

In his critique of the online advertising in online social networks Clemons (2009) has trouble understanding the value these electronic networks offer to advertisers. Like many others he mostly sees advertising on these websites as a new channel for mass-media advertising. However, the aspect of customization of the advertising shown to the user is not discussed. Since online social networks have significant data on the user's behavior a point can be made that the social network operator can target users based on these preferences and the so-shown advertising has higher impact. Also his comparison on advertising at an offline, real-life social gathering is flawed in so far that it isn't the user advertising through the network but rather the network itself. A point that is important to take from Clemons (2009) is that the financing through advertising is not the correct one for every social network. And indeed we see different types of social networks today, some having revenue generated by advertising as their primary income, others working for example through subscriptions.

Gneiser et al. (2010) tailored a valuation model specifically to the characteristics of online social networks. They identify the value of a network's users, their relationships and the network effects created by those relationships as the value drivers of this type of business model. This leads to a focus on the users' interconnectedness within the network as an important variable in their valuation. Their model is based on the customer-based valuation models which are fundamentally based on the discounted cash-flow model. Gneiser et al. add network effects to their interpretation of customer centric valuation. The authors argue that even if a customer does not have any cash flow generation by herself, she might still have value to the social network because of the interactions she has with other users. These interactions lead to higher barriers for other users to exit the social network. Additionally to the number of users it is also important to consider the interconnectedness since this can be seen as a proxy measure for how actively the user engages with others in the network and therefor generates stronger relationships with stronger network effects. The created model is then used to value the German social network Xing, which is specialized on professional relationships and utilizes a subscription model. To find the Customer Equity (CE) the sum of all Customer Lifetime Values (CLV) is added as is usual for the customer based valuation methods. CLV is hereby defined as the discounted sum of all cash flows generated by a user. Gneiser et al. divide users into cohorts and use retention rates to model the user base over time. These retention rates are defined as the conditional probability that a specific customer remains a customer of the social network during a period of time given the fact that she has been a customer in the previous period. The retention rates are modeled to be positively correlated to the user's interconnectedness due to lock-in effects of more intensive usage of the network. Furthermore the interconnectedness is believed to have decreasing marginal utility for a user meaning that, other things equal, the same absolute increase in a user's interconnectedness has a smaller absolute effect on a user's retention rate probability the stronger her degree of

interconnectedness is. To find the value of the company the CE is added to the value of all non-operating assets subtracting the market value of all costs that are not customer related and the market value of the company's debt. A main part of the work of Gneiser et al. is the question how to model or quantify a user's interconnectedness in an online social network. It is important to not only consider direct contacts of a user but also the indirect contacts since these are also beneficial for the user. As an intuitive explanation the authors mention that a contact to another user with many contacts might be more useful than a contact to another user with fewer contacts. To model this degree of interconnectedness the authors analyze different measures of centrality. The measure which fits their criteria the best is based on the PageRank-algorithm³. The valuation model of the paper is then used to value the German professional online social networking site Xing. The authors only use publicly available data which leads to them having to use an easier centrality measure (the so-called common centrality measure which only measures first degree contacts) instead of the proposed ideal measure based on the PageRank-algorithm. (Gneiser et al. 2010)

The paper by Gneiser et al. shows a couple of very interesting facts regarding the discussion of this thesis. One has to be very careful when using their results on Twitter, however, since the business models of Xing and Twitter are fundamentally different in terms of the monetization of their user base and the target user group. In 2007 Xing generated 94% of its revenues via subscriptions on Premium Memberships (Gneiser et al. 2010). This business model is also used by the competing professional network of LinkedIn, but there is no such membership for Twitter users at the moment. This leads to several implications when trying to use the model of Gneiser et al. on Twitter. Since the revenue of Twitter is not coming from the general user base

³ The PageRank-algorithm was created by the founders of the search engine Google Larry Page and Sergey Brin. Its core use was the ranking of the importance of web pages. The idea behind the algorithm can be described as a page being more important the more other web pages have links to the specific page. (Brin and Page 1998)

it is very hard to use the customer equity method due to problems with estimations of cash flows. This is simply because of the fact that the user does not generate any direct cash flow herself. Rather the user's actions (clicks or replies for example) generate revenue from advertisers on Twitter. Another interesting difference between Xing and Twitter are the relationships between the users. While on Xing (and similar sites) a relationship generally is symmetric and has to be initiated by one side and accepted by the other, Twitter relationships are asymmetric most of the time. This leads to differences in the measurement of centrality and interconnectedness. While Gneiser et al. only have to distinguish between direct and second degree contacts, an analyst looking at Twitter would have to work with two different relationship types (followers and accounts followed). It also can be argued that the second degree contacts in the direction of accounts the user follows are of value for the user. However, the second degree contacts of followers might not be of much value for the user since she does not have too many incentives or possibilities to engage with them apart from directly searching them over the follower's profile. As Gneiser et al. already struggled to use the adapted PageRank-algorithm in their valuation due to restrictions with only publicly available data, a further complication as would be needed in the case of Twitter might just be too much to handle. One of the features rendering the Discounted Cash Flow Valuation as well as the relative valuation by multiples so popular is that they are comparatively easy to use. A valuation method that strives to gain footing in a practitioner's world has to balance accuracy (both in terms of academics and business model representation) and ease to use. With those points being made, however, Gneiser et al. identify users, their interconnectedness and the network effects created by their relationships as value drivers for social networks. Also the notion that users who do not generate any cash flow themselves are nevertheless valuable is a key insight. These points can and should be used when valuing Twitter since they apply in a similar fashion.

When discussing the valuation of Twitter from a social networking site point of view there are several difficulties to be considered. Firstly, it is unclear if Twitter can be valued as a social network at all. While some authors (like Howard 2008) include Twitter as social network and the mobile Twitter application is listed under the category “social” on the Google Play store (Google 2014) authors like Heidemann et al. (2012) do not include Twitter into their definition of a social media but rather as a content related website like Youtube or Flickr. This is understandable because although Twitter has many of the characteristics found in the literature to be defining for a social networking sites like the possibility of creating and maintaining a profile as well as different ways to communicate, this is not the primary focus of Twitter which is made apparent by the lack of information one is able to provide through one’s Twitter profile. The focus of the site is indeed more on the sharing and discovering content. However, in a broader sense Twitter can be seen as a social network even though it might not count as a dedicated social networking site. The implication is that many of the underlying value drivers of the social networking sites’ business model do apply to Twitter as well. A focus of every valuation method aiming at finding the value of Twitter has to take into consideration the amount of users as well as their activity on the site. As discussed above the valuation model of Gneiser et al. (2010) provides important insights into why these factors are important but since the valuation model itself is based fundamentally on the discounted cash flow method it is once again hard to give a value to Twitter. Mostly due to the fact of the indirect revenue generation of the general user base via advertisers it is not feasible to use the most intuitive valuation method, namely the customer based valuation, like Gneiser et al. did on the subscription based social networking site Xing. This indirect effect of the users on the revenue of the company might be the most defining aspect of Twitter’s business model and it is therefore naturally a focus of this thesis. This aspect of the business model is shared by social networking sites like Facebook which leads to shared value drivers. However, one has to be careful when comparing

these companies since Facebook is a classic social networking site and Twitter while sharing some of the features has a different focus.

5.2 Twitter as a Two-Sided Market

When looking at the business model of Twitter one can easily distinguish several different parties involved in the revenue generation process but not all of them contributing directly. This is a necessity considering the fact that signing up for Twitter and using it is free of charge. A general user does not pay anything for the service provided, in fact, since Twitter does not offer a premium subscription it is not possible for the general user base to directly pay Twitter for their services. Instead Twitter chose to go with the business model of advertising. This means that advertisers pay to have their ads on Twitter keeping the service free for the users. This form of business model is by no means a new one though. In fact the beginning of such models is not even to be found with the rise of the internet and the dotcom era. The revenue model Twitter is using is a so called two-sided market. The two sides differ by the fact that one side is subsidized while the other side is generating most (or in Twitter's case) nearly all of the revenue. The following section will provide an overview of the corresponding literature and will try to find value drivers for this business model in order to get a better understanding of the business Twitter is operating, ultimately leading to a foundation for a valuation. The advantage this method has over previous works searching for value drivers in internet businesses (as in the dotcom era) is that the method is not necessarily focused on Twitter being an internet based firm but rather the value drivers are derived from the core fundamentals of the underlying business model and the characteristics of the resulting market form. Combined with the better understanding of the possibilities the internet provides the result should be close to the actual forces defining the success or failure of Twitter and similar companies.

This section aims at discussing the most important characteristics of two-sided markets in the context of analyzing Twitter's business model. Therefore there are many aspects like the (very interesting) questions these markets raise in terms of anti-trust regulations that are not covered.

5.2.1 Two-Sided Markets in the Literature

One example of a two-sided market is the market for video game consoles. The producer of the gaming console provides a platform and has to optimize her business model according to two sets of agents. On the one hand players who buy video games and use the platform (console) to play them and on the other hand video game producers who create video games especially for the platform (console). The defining characteristics of this and similar markets becomes apparent once pricing is involved. Gaming consoles producers generate revenues from both groups of agents. They sell consoles directly to the players and license the right to produce games for the console to video game producers. In order for the console to be a success both parties are necessary. Players will only buy a gaming console knowing that there are enough games they can play using the specific console while game producers will only pay licensing fees and create games for a console if they are sure that there is a large enough player base that is willing to buy the games. This causes indirect 'network externalities' in the market. The larger the player base for a specific console, the more interesting the console becomes for game producers and vice versa the better the game offering for a platform the more incentive players have to buy the console. This leads to special cases like Microsoft announcing the licensing of the next title of the famous gaming franchise Tomb Raider exclusively for its gaming console Xbox in 2014 (Griffiths 2014). In the case of video game consoles this leads to another phenomenon which is often seen in this sort of markets. One side of the market is subsidized

by the platform provider to encourage the network effects and increase overall profits. In case of gaming consoles the price of the console itself usually has a very slim to negative profit margin for the producer who then charges a premium for the game licenses sold to the game producers.

Other examples for two sided markets include credit cards where a card only becomes interesting for the user if it is accepted by a large number of merchants while the merchant herself has little incentive to accept cards that do not have a significant user base. Similar things are valid for publication software like Adobe Acrobat (authors and readers being the two parties) or shopping malls (having to ensure customers and shops). Interestingly enough the similarities between these markets which are now termed two-sided markets have seen focus from the literature only in the last decade. Prior work has been focused specifically on one industry. (Roson 2005)

“Put simply, a two-sided market is a market in which a firm sells two distinct products or services to two different groups of consumers (the two “sides”) and knows that selling more to one group affects the demand from the other group, and possibly vice versa.” (Filistrucchi, Geradin, and Damme 2012, 3)

Caillaud and Jullien (2003) wrote a seminal paper on network externalities and price discrimination in the internet intermediation service provider market. Specifically they covered the topic of the ensuing chicken and egg problem. With the existence of indirect network effects it is important for the intermediary to have both sides on board. The interesting part of this is that one side will only join when the other side is sufficiently represented on the platform. Their analysis is motivated by the emergence of intermediaries on the internet providing some sort of

match-making service between buyers and sellers. (As one of the first papers it does not exclusively analyze one certain business (such as credit cards or newspapers) but rather sees similarities between markets which will be termed two-sided markets later on.) The authors' implication for valid business strategies in such an environment is that of divide and conquer strategies. Utilizing such a strategy the intermediary subsidizes one of the sides (divide) while trying to recoup the lost profits from the other side (conquer). In their framework there are two main aspects of these intermediary markets that have significant influence on how equilibria can be found. These are the possibility of multi-homing (a user has the possibility to register for several platforms) and the occurrence of different pricing structures (membership fees versus transaction based fees). The authors further conclude that competition policy design has to account for the network externalities since it is not necessarily the case that consecration leads to inefficiency in these markets. (Caillaud and Jullien 2003)

A similar point is made by Jullien (2005) regarding multi-homing and anti-trust regulation. Due to the lowered levels of competition between platform providers it is not proven that access to many different platforms is in the interest of consumers. Also competition rulings should be careful in these markets since the traditional pricing analysis fails in face of the subsidies utilized to attract the side with lower network externalities. (Jullien 2005)

Another early seminal work in this field is provided by Rochet and Tirole (2003). One of the example industries the authors consider are video game consoles with the two sides of players and video game producers, the console producer being the platform provider (or intermediary as in Caillaud and Jullien 2003). Rochet and Tirole make it clear that they are concerned with the market characteristics rather than specific industries. They list several industries such as web browsers, operating systems, newspapers, TV networks, shopping malls or social

gatherings as relevant to their theory. This paper is among the first coining the term two-sided market. As done by other authors the business model of one “loss-leader” side that is subsidized with another “profit center” side is concluded to be applicable to solve the chicken and egg problem of getting both sides on board. This choice of a business model is, however, different than the classic case of multiproduct pricing as can be found with razors and razor blades. In both cases there are two “sides” benefitting each other in some way. The main difference is that in the case of razors the same consumer buys both the razors and the razor blades therefore the network effect is internalized by the consumer. Rochet and Tirole therefore embed their theory on network economics with focus on network externalities and multi-product pricing where cross-elasticities are important. They also identify characteristics that are somewhat unique for two-sided markets such as the pricing of one side of a market depending on the multi-homing of the other side of the market, leading to interesting questions on the competition of platform providers. This paper is focused mainly on pricing decisions in two-sided markets and arrives at multiple conclusions including that pricing in these industries deviates from a “fair” allocation of prices and is more concerned with “getting both sides on board”. This focus on getting both sides on board for pricing decisions can be found for both monopoly and competitive platforms. If the buyers on a platform are allowed to multi-home it is easier for the sellers to take advantage of this resulting in platform pricing more favorable for the sellers. On the other hand the presence of high-profile buyers (or marquee buyers) which create a strong surplus for sellers leads to lower prices for the buyer sided (assuming no price discrimination). The hypotheses of the paper are then applied to seven industries in form of mini case studies. Exemplary for the portals and media industry the viewers or readers have traditionally been the subsidized side while advertisers were the profitable side. This model has been widely adopted by many internet based content providers. (Rochet and Tirole 2003)

In another leading work on this topic Armstrong (2006) identifies three main factors that determine the pricing in two-sided markets. Firstly the strength of the cross-side network externalities. If one group benefits more from the size of the other group than vice versa the group that has the stronger network externalities (i.e. the group that has more value to the other side) is encouraged to participate on the platform disproportionately by lowering their fees (this ties into the business model of subsidizing one side as proposed by other authors). If there are competing platforms it is necessary to distinguish between fixed fees and transaction based fees. Armstrong states that transaction based fees can be used to lower network externalities. This is because the value of interacting with a user from the other side is lowered by the fee. Also this helps in the often cited chicken and egg problem since the users only pay in case of a transaction, rendering the fact that the other side is on the platform already less important. Armstrong also argues that transactional fees can help to improve the platform's profit. The third crucial factor determined by Armstrong is whether or not multi-homing is possible. Armstrong considers the three cases where i) both sides single-home, for which it is hard to imagine a market, ii) one side multi-homes whereas the other single-homes, which leads to platform power because the multi-homing side has to cope with the platform chosen by the single-homing side if they want to interact with the whole group, and lastly iii) the case when both groups multi-home which is not considered by Armstrong since he believes it is very uncommon if the main purpose for joining the platform is to interact with the other side. (While this might be true for some markets it fails to acknowledge media markets with advertisers, since the reader does not usually buy a newspaper because of the advertising. More generally if network effects are not symmetric case iii) becomes a lot more common). Another interesting point made is the one of intra-platform competition. An example for this would be two car producers competing over limited advertising space in a newspaper. According to the paper's hypothesis platforms will encourage competition if users can be charged for entry while the

competition is restricted when entry is free to maximize revenue from the users (charge more from one car manufacturer for the exclusive right to advertise)⁴. (Armstrong 2006)

One of the most cited formal definitions of a two-sided market comes from Rochet and Tirole (2006). They base their definition of the more general term of multi-sided markets (Twitter as well can be seen to have more than two user groups) on the effects pricing of the respective side has on the other side. More specifically they restrict two-sided markets to markets where not only the overall level of prices charged by the platform influences the amount of transactions performed by the users of the platform but also the structure of these prices has a significant influence. They see the concept of two-sided markets embedded in the ideas of network externalities and multi-product pricing. Rochet and Tirole distinguish between membership charges and usage charges as well as membership externalities and usage externalities. In general the value to the users of a platform is generated by usage, membership alone is usually not sufficient to create value (an example provided is that users of a telephone benefit from a call not from the possession of the telephone itself). The platform can charge non-usage based fees. In the case of the video game console this would be the licensing fee charged from game developers (as opposed to royalties charged on sales of game copies). If the amount of users has an influence on the value users derive from the platform then the membership generates so-called membership externalities. A necessary (but not sufficient) condition for a market being two-sided according to the definition of Rochet and Tirole is the violation of the Coase theorem. This theorem states that *“if property rights are clearly established and tradeable, and if there are no transaction costs nor asymmetric information, the outcome of the negotiation between two (or several) parties will be Pareto efficient, even in the presence of externalities.”* (Rochet and Tirole 2006, 6). The idea behind this theorem is that two parties negotiating with nothing

⁴ This topic, however, is not a main focus of the paper and is left to be analyzed more thoroughly in other works.

hindering the negotiation will arrive at an efficient outcome and the allocation of prices charged by the platform does not matter. This is not true for two-sided markets since a user group's usage of the platform is dependent on the price the platform charges from this user group. Due to network externalities the usage of this group then also effects the second group, making the structure of the pricing non-neutral. In short this means that at a given price level for both user bases it is important how much is charged from either side. In terms of optimal pricing of the platform the prices naturally depend on the price elasticities of the users. Interesting are the implications that the pricing of these markets have on interpretations of costs. Marginal costs can be seen as opportunity costs. When the platform is utilizing usage pricing additional usage on one side has its cost lowered by the price that can be charged from the other side additionally because of the increased value the second side gets from the network externalities. Analogically for membership pricing the presence of more users on one side leads to the possibility of raising the prices on the other side without losing customers. This also implies that when one side is charged at a significant margin it is often the case that the other side is subsidized since it becomes more profitable to add users on this side to ensure the high margins on the other one. The price elasticity of the user groups is also influenced by the competition of the platform as well as multi-homing (users that use several similar platforms). (Rochet and Tirole 2006)

In terms of Twitter being a two-sided market according to the definition of Rochet and Tirole (2006) it is hard to argue that the structure of pricing does not matter. It is common practice for social media websites to offer at least the basic functionalities to the user for free. The general user base does not necessarily benefit from advertising shown on the platform so a model where costs would be split between the advertisers and the users would most likely not work. Membership fees are not relevant to Twitter because the main incentive to charge those fees from the platform's point of view is when it is hard to measure and tax the transactions between

users on the platform is not applicable on the web. Twitter is able to track the transaction between advertisers and users, namely a user engaging with an ad shown by a specific advertiser, and is then able to charge the advertiser accordingly. This makes membership fees an unnecessary risk to jeopardize membership externalities.

Many authors concluded that the appropriate business model in two-sided markets seems to be one that subsidizes one side while making profit from the other one. Platforms like Twitter, Youtube and Facebook did this to an extreme where they offered their product to one side of the user base for free. This leads to the legitimate question of “*How can firms profitably give away free products?*” as asked by Parker and Van Alstyne (Parker and Van Alstyne 2005, 1). The classic reasoning for giving away free products has been to exploit customers later on in the product lifetime cycle or to tie the offering with other products. However, there are many firms that give away their product for free and do not intend to use one of those two classic methods in the future. Parker and Van Alstyne show that discounting an offer can increase profits, with even negative prices possibly becoming optimal. One of the most important decisions to make for the platform operator is the decision which market to subsidize. This might seem trivial when looking at some models, however, it might not always be clear from the start. For example document reader software usually subsidizes the content consumer (the reader) while charging the content creator. On the other hand content creators are subsidized in the market of operating systems while the content consumers pay to get access to this platform. In fact it is not the type of user that determines which side of the platform to subsidize but rather the relative sizes of the network externalities. In their model the authors allow for both positive and negative network externalities to occur. Another key factor of giving away a product for free is helped by the unique characteristics of information. Namely the low to negligible marginal costs help the platform to subsidize a large market for the cost of essentially only the

initial fixed costs. The market that should be chosen to be subsidized is the market that does more for the complementary markets demand when increased in size. In other words the market inducing the strongest network externalities to its counterpart should be given the discounted product, regardless of the type of the users. If the network effects are strong enough it is then rational to invest into a product that will be given away for free eternally. (Parker and Van Alstyne 2005)

Eisenmann et al. (2006) mention multiple factors that determine which side of a two-sided market the platform operator should be willing to subsidize. In addition to the already mentioned network effects the authors mention the user sensitivity to price and quality, costs and brand value. In the case of user price sensitivity it is generally best to subsidize the user base with a higher sensitivity to prices. Similarly the user base demanding quality and therefore having a higher sensitivity to quality standards should be subsidized. The other user base that has to provide quality is then charged which leads to a type of quality assurance. The example given by the authors mentions video game platform producers charging game developers to ensure a quality standard for their players. Costs obviously have to be taken into consideration when deciding about potential subsidizing. If a company should decide to subsidize a user base with high marginal costs per additional user the risk is much higher than when a new user costs basically nothing. Therefore the decision to subsidize the user base with lower marginal costs is usually better. Lastly the user's brand value should be taken into account. The so-called marquee users that have high impact on other users (from whichever side) joining the platform should be given extra attention. Examples for such high-profile users would be large buyers or big game developers with attractive game title brands (or in Twitter's case famous personalities like politicians and actors). Many of these factors do not matter in traditional pricing decisions,

making two-sided platforms hard to manage successfully. (Eisenmann, Parker, and Alstyne 2006)

Rysman (2009) distinguishes two major strategic decisions in two-sided markets: Pricing and openness of the platform. As other authors he suggests that the side with stronger cross-side elasticity is subsidized leading to an even bigger influence of elasticity on the price as in classic market pricing decisions. He also argues that competition from other platforms can drive prices down more heavily in these markets since users or buyers are even more valuable due to network effects. The second strategic decision, openness, has several dimensions. Platform providers need to choose how open they want to be in terms of sides, whether they want to be one-sided, two-sided or multi-sided and they choose the way they interact with other platforms. Here the choices are to be compatible, incompatible or integrated in some way. To illustrate the decision of how many sides a platform chooses the example of Apple and Microsoft can be used. While Apple produces both an operating system and the corresponding hardware, Microsoft chose to be more open and only provides the operating system, having another side of the platform being third-party hardware producers. In a way this decision of openness can be compared to the choice of vertical integration in classic industries. The second decision on openness of a platform can then be compared to horizontal integration, since it concerns the compatibility to other platforms. Again there are examples for different decisions on this matter. While most banks choose for their customers to be able to use a variety of ATMs, video game consoles do not choose for their games to be able to be played on another platform (although the game producers can of course multi-home and develop their games for several platforms). An interesting factor regarding this is when one side can be made exclusive, which makes it possible to charge premium prices from the other side. The choices different platforms make on the matter of their own openness also shape the competitive landscape of the industry. This

can be a winner take all market with one dominating firm or several co-existing platforms. (Rysman 2009)

As Filistrucchi et al. (2008) note there are significant differences in the many definitions that exist in the literature. However, the characteristic factors of two-sided markets are similar enough so that the markets can be identified. Summarizing from the literature the authors name that the firm has to sell more than one product or service, the buyers consist of two distinct groups each buying products or services while their demand is interdependent. Also the buyers are not able to completely pass-through price differences charged from them by the platform onto one another. In terms of network externalities or indirect network effects it is important to note that while the effects may be positive or negative (the TV media market comes to mind with a positive and a negative externality) at least one positive network externality is necessary to identify a two-sided market. Should all effects be negative the platform could not exist since no user wants to engage with users from the other side. Since these network effects are of great significance for the markets the authors propose several methods to identify, categorize and measure those externalities. It is important to know how many externalities there are, whether they are positive or negative and finally how strong they are. If other factors than the network effects are of importance to analyze depends on the nature of the two-sided market. If the market is a non-transaction market it is sufficient to only consider the externalities while when looking at a transaction market other factors become important as well. These factors include transaction costs or any other limits to the pricing process between the users as well as constraints introduced by the platform on the pricing of users. An example for such a practice would be the rule that credit companies enforced onto merchants forbidding them to charge any markup if a customer paid with a credit card (the so-called no-surcharge rule). One case where it is particularly important to correctly identify network externalities is the antitrust regulations

concerning mergers and acquisitions trying to estimate the future market power of the new entity. The first and probably the most simplistic approach proposed to identify and categorize network externalities is the qualitative approach. Hereby the analyst simply tries to assess whether or not there are network effects and what sign they have. While this approach is easy to use and might be a good starting point for an analysis it is unable to measure the significance of the effects. This is especially important if pricing differences cannot be passed on between the users which is per definition the case in non-transaction markets. Due to its intuitive nature the qualitative approach is often used. The authors then describe the deductive and the interview approach as two forms of the qualitative approach to identify network externalities. The deductive approach is based on logical argument. Identifying network externalities can be very simple and apparent; these are the cases when the deductive approach works best. Unfortunately some network effects are not obvious at all or it is unclear which sign they have. The authors name several examples where networking externalities of advertising in media is interpreted in different ways. A second qualitative approach, which is slightly more refined, is to assess the externalities via interviews. These interviews are conducted on agents in the market questioning them on their relations to the other side. Again, however, this approach does not reveal the strength of the network externalities as is the case with all qualitative approaches. A stated preference approach assesses the network effects by surveying the agents not only on their value (positive, neutral or negative) of the other side but also on the strength of possible value. This can be done by asking questions on the preference of hypothetical states of the other side (“Would you still advertise in this newspaper if the readership dropped by 10%?” would be an example). The main problem with such an approach is that one cannot be sure if the stated preferences are true and even if they are, how much they correlate with the actual behavior of the agents. The last approach the authors describe is the revealed preferences approach which is based on the collection of data on the actual behavior of the participants in the market. This

data can be market data (such as sales or the cover and subscription prices) or consumer level data such as how many newspaper a reader buys. Technological progress is being made to help measure consumer level data. Based on this data it is then possible to estimate the demand levels and ultimately strength and sign of network externalities in the market. Due to its implications of assessing the strength of networking effects the revealed preference approach naturally has advantages over the other approaches described with drawbacks mostly due to the comparatively high effort and the availability of the data. (Filistrucchi, Geradin, and Damme 2012)

5.2.2 On Network Externalities

Network externalities are arguably the single most defining characteristics of two-sided markets. This section gives an overview of the different types of relevant externalities that can be found in the literature.

Among the most seminal works in this field is the paper of Katz and Shapiro (1985). The authors argue that network externalities may exist because of physical effects (like a telephone user who benefits from others having a telephone) or indirect effects (an owner of a PC is interested in how many others have similar compatible PCs because this will indirectly influence how much different software will be available). The third externality they differentiate is a positive consumption externality that arises for durable goods where the purchase is influenced by the magnitude of the service network (the example of foreign car brands with a thinner repair and service network is mentioned). Katz and Shapiro also consider the fact of compatibility. If the technology a user is considering a network for is compatible with another technology, the network effects include both technologies. (Katz and Shapiro 1985)

Farrell and Saloner (1986) analyze compatibility under the aspect of innovation. If a new, superior technology is not compatible to the standard technology at the time, users that switch before others bear costs because they cannot use the technology to its full effect. This causes delays for users of the old technology (the installed base) switching to the new technology which then causes the network of the new technology to build up slower. There are two network externalities present. Firstly, the market of the old technology stops in its growth or will decline in size if the new technology is adopted causing losses for users of the old technology. Secondly, early adopters of the new technology suffer losses because the network of the new technology is not expanding rapidly enough. The size of the installed base, the old technology's network, acts as an entry barrier for the new technology. If network effects are strong, meaning the new technology is much more valuable when having a large network, then this entry barrier can cause the new, superior technology not to be adopted because users who switch early would bear a disproportionate amount of the costs of non-compatibility. (Farrell and Saloner 1986)

An interesting point to further show the importance of network effects is made by Economides (1996). He argues that in markets with strong network externalities it can be optimal for an innovative monopolist to license his technology for free and thereby invite competitors into the market where he could have been a monopolist. Although this seems counterintuitive at first Economides argues that the higher sales expectations from consumers, that a monopolist can often not induce on her own, shift the demand curves for all market participants outwards and therefore lead to higher profits for all market participants (including the former monopolist). (Economides 1996)

Eisenmann et al. (2006) mention two different types of network effects which both can either be positive or negative. The first type are same-side network effects, meaning that the size of the same side of the network has an effect on the value users derive from a network. These effects are often negative (examples would include shops in a mall preferring to have few rival shops selling the same products to lower competition) but can also be positive (as in telephone users benefitting from more people having telephones). The other type of network effect is the one defining for two-sided markets, namely cross-side effects. These occur when the size of one side has an influence on the value the other side attributes to the network. Again these can be positive (as in card holders of a credit card benefitting from many merchants accepting the card) or negative (as in TV users who prefer to view less advertising). Positive network externalities are one of the most intriguing aspects of two-sided markets for platforms to join because they allow for increasing returns. Traditionally businesses often struggle to find more growth after a certain size since it becomes harder to find new customers for the offered product. In the case of positive network externalities more customers lead to an easier time finding even more customers since the value of the product increases with the size of the network. (Eisenmann, Parker, and Alstyne 2006)

As mentioned above Rochet and Tirole (2006) coin the terms direct and indirect network externalities while also accounting for differences in membership externalities which occur simply by having users on the platform versus usage externalities which need a transaction to happen between users. (Rochet and Tirole 2006)

Advertising is often used as an example for negative network externalities which is certainly true for many types of particularly intrusive types of ads. Kaiser and Song (2009) found evidence, however, that high quality advertising placed in the right magazines are actually

appreciated by readers. The authors analyzed German print magazines and found that in magazine types where advertising is more informative like women's magazines, business related magazines or car related magazines readers are actually appreciative of advertising. On the other hand in adult magazines where advertising is generally less informative the results of the study shows readers' disliking of advertising. These supply-side effects may be in conjunction with demand-side effects such as the heterogeneity of the reader base which was not tested by the authors, however. (Kaiser and Song 2009)

Afuah (2013) argues that network effects are not only determined by the size of the network but also by the network's structure. The author claims that the size of a network is only one factor influencing the value network members generate by using the network. Other factors include the centrality of the members or the feasibility of transactions. The value network members derive from being part of a network is important to generate a competitive advantage from the point of the network provider. Network structure, in itself consisting of the number of members (making up the size of the network), the relationships between the members as well as the characteristics of the members and the relationships, is shown to be an important factor for a network's value. Transaction feasibility is one of the factors determining the structure. If it is not possible for each member of the network to interact with every other member then structure matters. Figure 8 shows different kinds of networks, each of them having eight members but every network has a different structure in terms of with whom the members can actually interact. Afuah mentions network (b) in Figure 8 as an example for a classic two-sided network since members of one side only interact with members from the other side but not with those of the same side, an example being credit card networks. Network (c) in Figure 8 can be related to a social network like Facebook, where members can choose whom they want to interact with and the interaction with all members of the network is (realistically) not possible.

The network best representing classic network externality theory with an overwhelming emphasis on size is network (a) in Figure 8. In this network every member has the possibility to interact with every other member and therefore if a new member joins the effect would be the strongest. In the other networks such as (b) or (c) a new member joining would have an effect dependent on where the member joins. In the two-sided scenario of (b) only the network provider and the opposite side will benefit from the new member while in (c) only the members in the same subnetwork will benefit. Although all networks have the same size with eight members it is clear that structure matters in terms of network effects. (Afuah 2013)

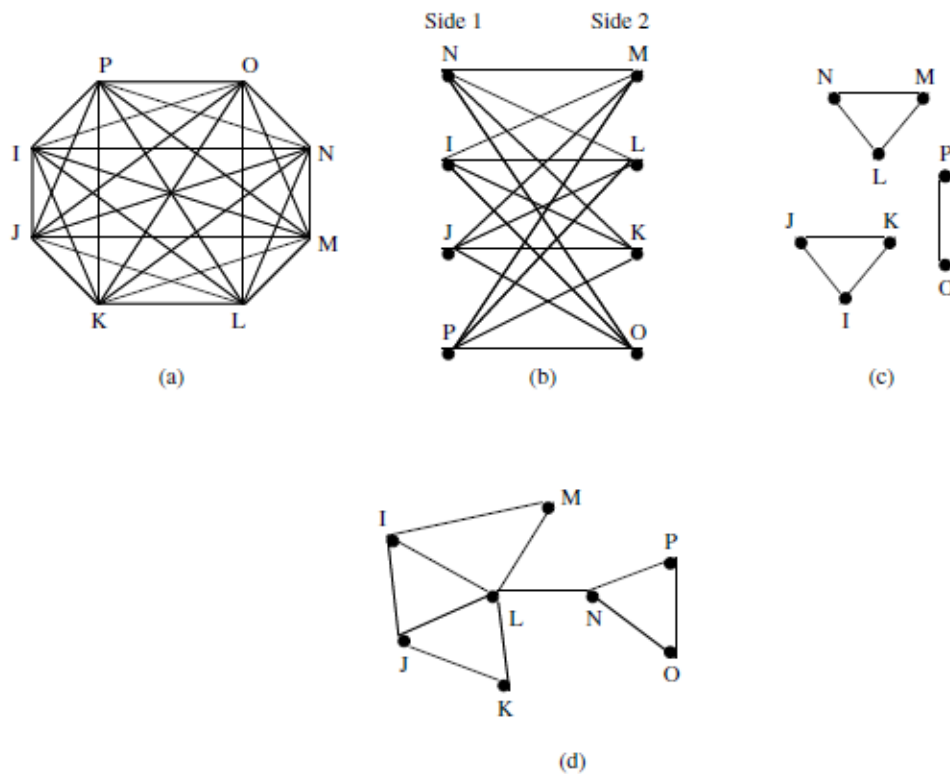


Figure 7: Different Network Structures (Source: Afuah 2013)

Another important measure mentioned by Afuah (2003) is the measure of centrality and structural holes. This can be seen in the network (d) in Figure 8. The node L is the most important of the network in terms of value because the node is the most central and can interact

with the largest number of other nodes. L can also be described as filling the “structural hole” in the network between the two subnetworks NPO and MIJK. Other structural characteristics of a network are the ties between the members (strong or weak), the roles that different members play (an example would be that in a credit card network some are merchants while others are card holders, the distinction being important when valuing the network) and characteristics of the members (a simplistic example being that an international telephone network is of more value to a user who speaks several languages). In addition to structural characteristics that have an influence on the network’s value there is also the conduct of the members. Afuah mentions opportunistic behaviour of the members which can lead to lower value for the other members, the reputation of members and the perception of trust. The amount to which these factors are relevant is of course largely dependent on the nature of the network. The author call these the basic conditions, split into the environment of the network and the nature of transactions occurring herein. This is also very intuitive since a member in a telephone network has different valuations of trust or opportunistic behaviour than a young firm using an investment bank’s network to plan its IPO. All the factors explained by Afuah are summarized in figure 9 below. The strategic implications these findings have can be summarized as to focus on more than only on the size of a network. This may be limiting opportunistic behaviour in a network or focusing on getting members with a high degree of centrality. (Afuah 2013)

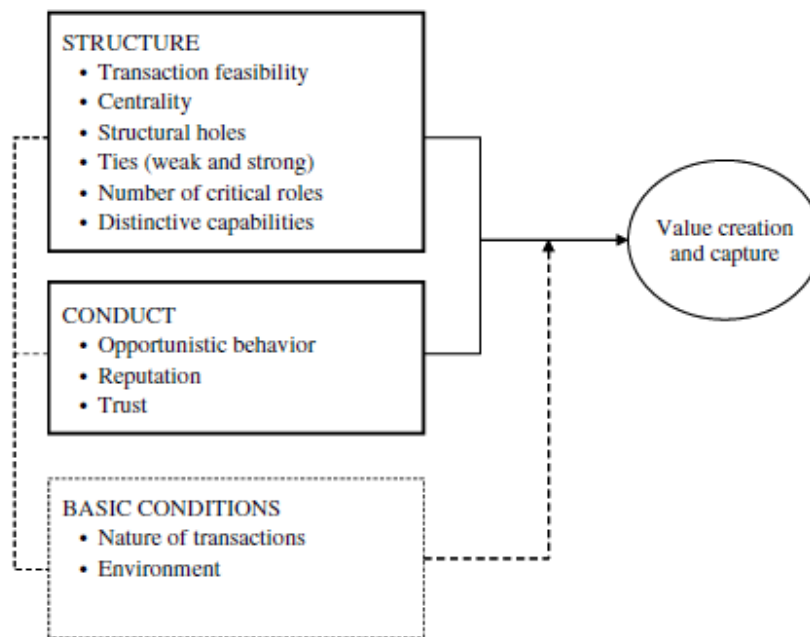


Figure 8: The Role of Structure, Conduct, and Basic Conditions in Network-Related Value Creation and Capture (Source: Afuah 2013)

Network effects have been shown to have relevance for stock price values by Rajgopal et al. (2003). The authors conducted a study on a sample of internet-based firms and estimated network advantages through web site traffic. It is argued that the network size is advantageous for these firms because users are able to interact more with other users through user-generated content and because the firms learn more about their visitors and are therefore able to better tailor products and services according to their needs. The network in itself is not the factor influencing the firm's valuation but rather the economic implications like the company size and the media visibility. The effects of network advantages are consistent even through the crash of the internet based stocks early in the year 2000 and is highly dependent on the business model. The market values these network advantages for the portal businesses as well as auction sites but not for electronic retailers and financial service websites. The findings further show that the network effects are strongly correlated to analyst forecasts of one and two year ahead revenue

and that they have explanatory power concerning the stock price above the information found in financial statements. (Rajgopal, Venkatachalam, and Kotha 2003)

Chiu et al. (2013) try to find factors important to users in order to stay loyal to a social networking site. As other authors they enrich the network externality (in this case the same-side or direct one on the side of the users) with several aspects other than only the size of the user base. While the study has been conducted on active users of Facebook, the results are useful to understand user loyalty to platforms in several markets. Their results show four distinct components of network externalities. Namely these are the perceived size of the network, the external prestige of the network, the compatibility and the complementarity of the networks features. The external prestige of the social network is positively correlated to a user's identification with the network while the perceived size has negative influence on it. Both the compatibility of the network with other services and the quality of the features provided (the complementarity) are positively correlated to the user's subjective well-being. These two factors (subjective well-being and identification with the social network) are relevant to the decision of users whether or not to stay in an online social networking site. While the size of the network has some negative implications, the authors warn in their comments on practical implications not to overrate this finding, since size is important in the initial decision to join the network. Nevertheless this study is further evidence that size alone is not sufficient to profit from network externalities. (Chiu et al. 2013)

5.2.3 Regarding Competition in Two-Sided Markets

Network externalities do not only make up the most important characteristic to identify two-sided markets. They are also among the most crucial ones to understand for platform providers seeking to compete in a two-sided market.

Noe and Parker (2005) identify low marginal costs, high fixed costs and a winner-take-all structure as characteristic factors in the (internet based) markets for information goods. Based on the literature from the dotcom era that showed positive correlations between expenses such as marketing and R&D and firm valuation the authors formulate a model where costs of marketing and site development are considered as fixed costs and additional customers can be served with zero marginal costs. This is comparable to former studies done in the radio industry in terms of the negligible marginal costs but differentiates in the fact that a huge part of the investment of radio operators are into licenses and equipment that can be easily resold and are therefore no sunk costs. The findings of Noe and Parker are applicable to content-based firms on the internet like portals and online representations of newspapers (which is therefore very relevant to the topic of this thesis). Additional factors the authors see in this industry are that firms are not able to charge users for content (which is applicable in the case of free-to-use websites), that switching costs are zero, failed websites have no salvage value from their developing costs and the investment into content leads to higher site quality (low technological uncertainty). According to their results these factors lead to a winner-take-all competition that can be compared to an all-pay auction. The user bases her choice of website on her knowledge of the website as well as the quality of the content. These two measures can be influenced by the website through expenditures in advertising and web site development. The authors show that with these settings the competition leads to highly volatile returns with only a small part of

the competing firms generating relatively large revenues. The authors also argue that early investments into advertising and site quality have a positive influence on the value of the firm if they are big enough to ensure a good competitive position in the upcoming periods. Although the model has some quite restrictive assumptions (as for example the preferences of users are the same across users) the authors show that the results are robust to perturbations of these assumptions. (Noe and Parker 2005)

Eisenmann et al. (2006) further expand on when a market is more likely to be dominated by one single platform and when co-existence is possible. Factors that lead to a market being more likely to have a winner-take-all competition are high multi-homing costs, strong network effects and weak preferences of users regarding the platform features. When the costs for multi-homing for at least one side of the market is high then it is more likely for the market to be dominated by one platform. This has happened in the operating system market where additional hardware and software makes it expensive to multi-home for PC users giving Microsoft a dominating position for a long period of time. Strong positive network effects (both cross-side and same-side) also render it more likely that a market features one dominant player. This is simply due to users converging. The last factor mentioned are weak preferences for special features. If specific user groups have interest in special features there are niche markets to be created where small platforms can prosper. In the case of weak preferences with relatively homogenous users a single platform is more likely to prevail. The authors mention the DVD market as one where all three factors apply which can be used to explain why the DVD has made it to a commanding market position. Multi-homing costs are high both for consumers having to buy multiple hardware settings as well as movie studios having to supply different formats of films. Additionally users prefer to have a wide range of films leading to strong network effects and

there are low special requests to playing videos making the market an ideal target to be dominated by one platform. (Eisenmann, Parker, and Alstyne 2006)

Evans and Schmalensee (2010) show that network effects lead to a demand-side restriction for young platform providers that classic business models do not experience. The authors consider platform business models which have easily reversible participation decisions meaning that users can change their participation status without high costs. In these markets the crucial mass that is necessary to render the product of the platform interesting for both sides of the market is a hurdle especially for new firms. This hurdle is dependent on the network externalities on the platform (whether they are positive or negative as well as same- or cross-side), how the tastes of customers differ (in order to be a platform that is accepted by the users in the first place) and the way the platform user bases adjust to situations below the threshold. According to the model it is often the case with successful platforms that the side that the provider had trouble with getting the necessary magnitude of users is adjusting more slowly in a downward fashion than the side that the platform attracts more easily and therefore is on the platform in sufficient numbers adjusts in an upward fashion. Evans and Schmalensee use the expression of a chicken-and-egg problem versus a chicken-or-egg problem. In the first case both sides have to be there in sufficient numbers for the platform to work, because if one side is not on board the overall participation rate will spiral downwards. In the second, chicken-or-egg case, it is sufficient to get one side of users to the threshold amount which will then help build the second side through indirect network externalities. (Evans and Schmalensee 2010)

Eisenmann et al. (2011) describe envelopment as one strategy to enter two-sided markets that helps to cope with the fierce competition these markets experience once matured. Network externalities are considerable entry-barriers for new firms in these markets since the new

platform has to solve the chicken and egg problem for themselves which existing platforms have already successfully done. Another entry barrier often found in platform-centred markets are switching costs. These market-specific entry barriers often lead to the necessity of having a revolutionary product for new entrants. By choosing the way of platform envelopment firms can avoid these barriers. This becomes possible since the user bases of different markets often overlap. A platform being successful in one market can then try to add additional functionalities from a different market to its own offering. The advantage when doing this is that the platform can leverage the already existing network externalities it has. An example of when this was successfully done is provided by Eisenmann et al. with Microsoft bundling its own Windows Media Player to its operating system and its server software for free. The Windows Media Player at the time did not offer any additional features as compared to the market leader in 1998, RealNetworks, with over 90 percent market share. However, the envelopment did work out well for Microsoft with RealNetworks rapidly losing market share and being near fully displaced today. This envelopment is illustrated in Figure 10 below, taken from the paper. Because of its attractive features platform envelopment is a natural step in the development of a platform and there are many successful examples to be found. (Eisenmann, Parker, and Alstyne 2011)

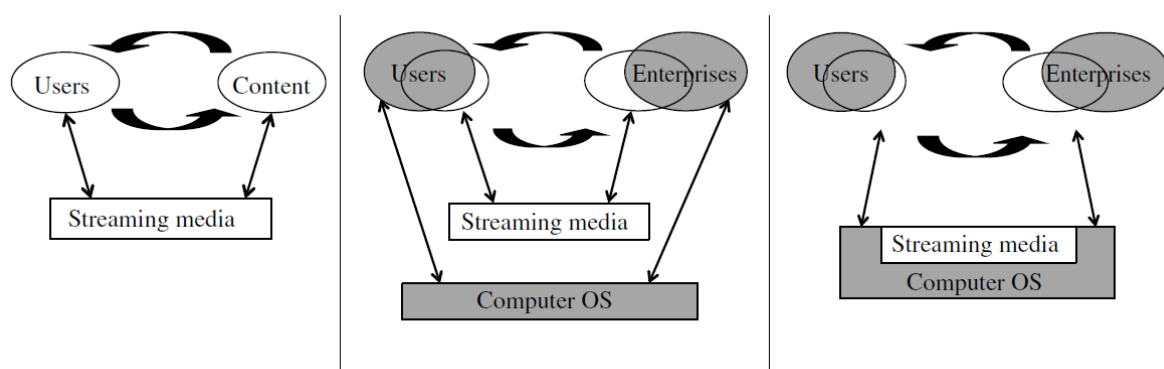


Figure 93: Microsoft's Platform Envelopment of RealNetworks (Source: Eisenmann, Parker, and Alstyne 2011)

Eisenmann et al. (2011) analyze platform envelopment from a strategic point of view, specifically as an option to avoid entry barriers when entering a new market. What makes platform envelopment, which is fundamentally based on bundling of offers, so interesting is that the platform markets exhibits both network externalities and economies of scale through leveraging of fixed costs. Both of these are dependent on the scale of a platform rendering an attack by another platform that bundles very threatening since it aims to lower the user base of the attacked platform. An important factor for the success of a platform envelopment is the overlapping of the user bases. If the user groups of the two platforms overlap highly an envelopment of the platforms is more likely than when the user bases are very different. Three scenarios of user overlap are shown in figure 11. In case I with a high overlap the platform can possibly charge a price that is close to the sum of the two individual platforms provided that switching costs are low. This is because the users are mostly willing to pay for both platforms. In case II on the other hand significantly fewer existing users of the attacking platform (A) are interested in the target's platform (T) and therefore less users will be willing to pay a price for the enveloped platform nearing the sum of the two separate platforms. Case III is comparatively tricky since a large portion of the target's user base would pay the combined price but only little of the existing user base. Usually it is difficult for a platform provider to profitably offer a bundle in such situations unless the provider is able to provide a large bundling discount for example because of very low costs of adding the new features. Usually high user base overlapping can be found in mature industries or industries where the platforms are integrated in a "system of complements", like online auctions and payment systems. (Eisenmann, Parker, and Alstyne 2011)

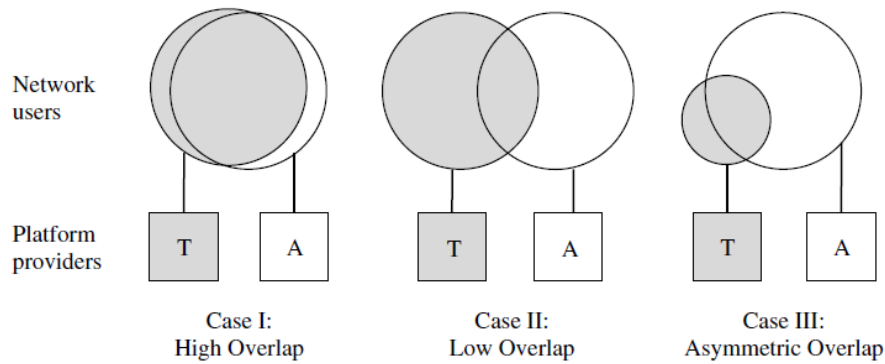


Figure 40: Three Scenarios of User Overlap (Source: Eisenmann, Parker, and Alstyne 2011)

In addition to the economies of scale through overlapping user bases Eisenmann et al. (2011) mention economies of scope as potential leverage in platform envelopment. This is the case when the offerings of the two platforms are relatively similar or the costs of adding the additional features are low because of synergies in the production chains. To create a typology of platform envelopments and the resulting attacks the authors characterize platform offerings in the following three ways: The offerings either are complements, substitutes or functionally unrelated. Complementary offerings are most likely to succeed in platform envelopment when the user bases overlap highly. In the case of substitutes it is important how strong the substitutes are. In the case of perfect substitutes bundling has no real value since the price paid for the bundle should be close to the price paid for each substitute separately. On the other side there is value in the bundling of weak substitutes. Here deep bundling discounts are usually necessary which makes economies of scope an important factor to consider. The third case of fundamentally unrelated platforms is difficult to assess generally but market entries using this type of platform envelopment are most likely to succeed when economies of scope exist and the user bases overlap, which is possible for markets like mobile phones and handheld gaming devices. Gaming and calling someone are fundamentally not related, however many people possess both a mobile phone and a handheld gaming device which both feature many of the same components like a display, a battery or microprocessors. In this case both overlapping

user bases and economies of scope are present. With all that said it is important to notice that one of the most valuable resources in a strategic attack via platform envelopment are the users. These are crucial for networking effects and can be leveraged to enter the new market requiring a critical mass of users. (Eisenmann, Parker, and Alstyne 2011)

While many models concerning platform competition for advertisers assume that platforms are undifferentiated (as for example Dukes and Gal-Or (2003) who consider exclusive contracts between advertisers and media platforms) Reisinger (2012) models platforms to compete both for users and for advertisers while advertisers are also allowed to multi-home in some variations of his model (which makes more sense in our case since the markets of this thesis' topic sell customized advertising). The parameters of his model fit the case of this thesis quite well since he is assuming free access to the platform of the user and time spent on the platform as well as utility for the user is endogenous and falling with an increase in advertising shown on the platform. The model shows that if advertisers are allowed to multi-home the advertising revenue falls with the nuisance users experience from advertising, and with the advertisement levels. The advertisement level of a platform in term is partly dependent on the differentiation of the platform itself, a platform similar to competitors will lower these levels and therefore have foregone revenues. (Reisinger 2012)

5.2.4 Implications for Value Drivers

When analyzing Twitter and looking for possible value drivers the rich literature on two-sided markets offers many answers to the question. In such a market, dominated by network externalities it is crucial for the platform provider to be able to generate and maintain these externalities as good as possible in order to be successful. In the case of Twitter it seems clear

that the general user base is the main source of network externalities, both same-side as well as cross-side. The more people use Twitter, especially high-profile marquee users, the more interesting it gets for other people to join the platform as well. In addition to these same-side network effects a higher general user base also leads to more interest from advertisers since it is possible to reach a larger audience through this medium. For the case of how more advertisers joining the platform is received by the users there is no clear answer from the literature. It seems to depend on the quality of the ads Twitter is able to generate. If this quality is high enough, users should not experience negative cross-side network externalities. The user base of Twitter is also the biggest asset of the company in several other applications. Adding to the benefit of the provided entry barrier for other platforms it also opens up the opportunity for some kind of platform envelopment in the future, which should help to lower the risk of the fast-moving business environment. Should the taste of the public change and micro-blogging was about to lose its relevance the user base of Twitter might be useful in an envelopment of another platform.

The discussion of two-sided markets also leads to some other interesting insights on the topic of Twitter's valuation. Firstly in terms of a peer group which is needed for many tasks to perform during the valuation process it has to be considered. Services like Facebook or Youtube come to mind, since they work with a similar, advertising driven business model. Problematic in this case is that Youtube, which would be a very good match since the company is also content driven, is no longer a separate entity. Due to the Winner-take-all competition it seems unlikely that another micro-blogging service will take Twitter's spot rendering the search for good peers even more reliant on the similarity in terms of two-sidedness of their market. Another point to be made from the aspect of two-sided markets is that Twitter has a specific edge in exploiting network externalities as opposed to social networks like Facebook or LinkedIn. The fact that

asymmetric relationships are supported in conjunction with the other user not needed to approve of the relationship helps to make the best of networking externalities.

The last point to be made to underline the user base as the main value driver for this business is the factor of increasing returns. The more people join Twitter the easier it is for the company to achieve all tasks mentioned above since its product is getting more and more valuable for its users.

6 Conclusion

The main point to be concluded from this valuation themed discussion is the way how to derive value drivers for businesses that are difficult to value with traditional methods. The method utilized during the dotcom era, taking the price as a starting point has the inherent flaw that if the price is irrational, the search for a value driver based on it is impractical. Rather a deep understanding of the business model is needed before drawing conclusions. I argue for a “bottom-up” approach rather than a “top-down” one.

When looking at Twitter the main value driver for its business is the user base. While this seems intuitive from the start it has value to arrive at this conclusion after dissecting the business model in order to understand why this is the case. Whether Twitter is seen as a social network or not, is not as crucial of a decision as to understand the underlying principles of its business. If social networks can be used as peers for valuation is not decided by the fact if Twitter is a social network but rather if social network to which one compares Twitter to is operating as a two-sided or multi-sided platform. While social networks and Twitter definitely share the user base as a common value driver, it is often not feasible to value them similarly.

Twitter’s user base is the main value driver for the platform because of network externalities, both same-side as well as cross-side. This network externalities lead to increasing returns because the service gets more valuable the more popular it becomes and to an increased interest of the profitable side of advertisers. In addition the user base provides an entry barrier in the winner-take-all competition of the market as well as the possibility to envelop other platforms.

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Appendix

Abstract (Engl.)

Valuing young, fast growing firms with negative earnings is one of the most complicated tasks in terms of company valuation with all of the common valuation methods failing to provide an optimal framework. The recently public Twitter adds its innovative and therefore hard to compare business model as a further complication. This thesis discusses valuation drivers that can be used as a foundation to value companies similar to Twitter.

The motivation for this discussion comes from the era known as the New Economy Period in the late 1990s and the stock market crash of the dotcom bubble in early 2000. During this time numerous authors tried to explain the valuations of the internet related stocks. This thesis intends to find value drivers of Twitter's business model without replicating the flaws identified in the former approaches to do so. This is done by a thorough analysis of Twitter's business model embedding it into the literature on social networks and two-sided markets.

The thesis is structured in the following way: Section 1 consists of a short introduction. Section 2 provides an overview over the academic literature during the dotcom era concerning the valuations of internet stocks and the implications for this thesis. Section 3 gives an overview over Twitter as a company and the service it provides. Section 4 covers the problems of traditional valuation methods handling the characteristics of young, not profitable and fast-growing companies. Section 5 analyzes Twitter from the perspective firstly the social network literature and secondly the academic literature concerning two-sided markets. Both are summarized and applied to Twitter. Section 6 concludes.

Abstract (Deutsch)

Die Bewertung von jungen, schnell wachsenden und unprofitablen Unternehmen ist eine der schwierigsten Aufgaben im Feld der Unternehmensbewertung. Jedes der derzeit meist verbreiteten Bewertungsmodelle hat mit dieser Art Unternehmen Probleme. Das kürzlich an die Börse gegangene Twitter bringt sein innovatives und kaum vergleichbares Businessmodell als zusätzliche Komplikation mit sich. Die vorliegende Arbeit diskutiert Faktoren von Internet-Unternehmen anhand des Beispiels von Twitter mit welchen man eine Basis für eine Unternehmensbewertung für derartige Unternehmen legen kann.

Die Motivation für diese Diskussion ist in der Zeit der Dotcom-Blase begründet. Der Börsencrash Anfang 2000 beendete eine Phase voller Euphorie bezüglich internet-basierter Unternehmen. Eine Vielzahl von Autoren beschäftigte sich in dieser Zeit mit Erklärungen für die Bewertungen der Internetunternehmen. Das Ziel dieser Arbeit ist das Finden von Faktoren zur Unternehmensbewertung ohne die Schwächen in der damaligen Analyse zu wiederholen. Dies wird erreicht durch eine tiefgreifende Analyse von Twitters Businessmodell anhand der akademischen Literatur zu sozialen Netzwerken und zweiseitigen Märkten.

Die vorliegende Arbeit ist folgendermaßen gegliedert: Sektion 1 gibt eine kurze Einführung. Sektion 2 gibt eine Übersicht über die Literatur zur Zeit der Dotcom-Blase, die sich mit der Bewertung von Internet-Unternehmen beschäftigt. Sektion 3 beschreibt das Businessmodell von Twitter und die Produktangebot des Unternehmens. Sektion 4 beschreibt die Probleme der klassischen Unternehmensbewertungsmodelle während Sektion 5 Twitter von der Perspektive der akademischen Literatur zu sozialen Netzwerken und zu zweiseitigen Märkten analysiert. Sektion 6 fasst die Aussagen der Arbeit zusammen.

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Sprachen, IT, Erfahrungen und Persönliche Interessen

Deutsch:	<i>Muttersprache</i>	Wurde von der Österreichischen Computer Gesellschaft eingeladen den Prototypen eines Katzenbaums als Start-up zu präsentieren.	Persönliche Interessen beinhalten strategische Karten- und Brettspiele, Kochen sowie E-Sports als wachsende Industrie.
Englisch:	<i>Verhandlungssicher</i>		
Französisch:	<i>Grundlagen</i>		
Ausgezeichnete MS Office Kenntnisse			