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VALUING INTERNET COMPANIES. SELECTED ISSUES

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Abstract

The internet business is one of the most dynamically developing sectors of the global economy. Internet companies attract ever higher investment despite elevated risk, therefore developing valuation methods adapted to their specificity is of growing importance. This article is an attempt at providing theoretical grounds for potential approaches used in the valuation of such companies. Some of the major difficulties arise from the following reasons: 1) in the early stages of development, internet companies, like many other start-up companies, generate losses or symbolic profits; 2) internet companies grow at a very fast rate (hundreds or thousands of percent p.a.); 3) the future of internet companies is very uncertain.

The analysis of different valuation methods carried out in this article points to the conclusion that methods well grounded in theory, such as the Discounted Cash Flow and Real Options methods, have not lost any of their relevance in the "new economy". What is necessary however is to adopt a different approach to probability estimation and consider the internet companies' high flexibility in making business decisions when faced with dynamically changing market conditions. The article also addresses a crucial issue for the stock value of public internet companies – the investors' expectations and emotions.

Keywords: internet, internet companies, valuation, valuation methods.

JEL classification: G12, G31, M21.

Introduction

The internet business belongs to the youngest and at the same time the most dynamically developing sectors of the world economy. The unquestionable leader in this business is the United States, where an initial public offering of a large internet company took place in 1992. Next big offerings were conducted by Netscape (1994) and Yahoo! (1996). Initial public offerings in Western Europe took place as late as 1999. In Poland, until the beginning of the 21stcentury there were no public companies that could be referred to as internet firms. Taking into consideration the market's unusually dynamic development and the plans of some companies that have been signalled recently, we may take for granted that the situation will change soon. Nevertheless, the issue of valuing internet companies is of great importance also at the moment as higher investment in this sector of the economy is related to a high risk. Thus, the need for knowledge regarding methods of valuing internet companies, well grounded in theory, is unquestionable and is one of the factors supporting the development of this sector of the economy.

1. The essence of internet companies

The first important issue related to valuing internet companies is the definition of an internet company. There is no explicitness in this matter, which seriously hinders the discussions on the topic. Without going into details of different meanings of "an internet company" we will adopt the following definition of this term. An internet company is a company, whose majority or significant part of revenues is generated by the internet or whose basic activity is based on a constant use of the internet. Typical examples of such companies are enterprises selling goods via internet and entities providing various services via internet (e-commerce).

Running a business with the use of information technology is called e-commerce. It covers a wide area of applications focused on the electronic exchange of processed or unprocessed business information between various entities, which enables them to do business. Technologies that comprise electronic commerce are, besides internet technologies (mainly www and e-mails), electronic data interchange, electronic money transfers, smartcards, bulletin board systems, data input technologies (bar codes, sign and voice recognition technologies, etc.), satellite identification and monitoring and a number of other technologies closely related to information technology. Electronic commerce assumes the integration of the various information technologies described above for business needs¹.

Areas of the application of internet to business are determined by three main directions of its use by companies. First of all, internet may be used to improve the communication within the company itself through a wide application of internet technologies such as e.g. e-mail or www. Very often those technologies are based on specialized systems supporting teamwork – for instance Lotus Notes – and apply common network services (e.g. www) for internal use. Such an internal network basing on the internet protocol is called intranet. The second area of the application of internet to commerce is the communication business-client. It is the most visible area of the application of internet due to the presence of the clients and direct contacts with them. Despite high expectations and optimistic forecasts, this area is still very specific in terms of offered products and services. Its development is determined mainly by common access to the internet in a given society. The third area of application has the best prospects for development in the nearest future, providing acceleration of business communications and ever greater precision in scheduling orders of both raw materials and products in terms of time and quantity².

2. Specifics of valuing internet companies

It may be assumed that valuing internet companies is difficult for three interrelated reasons³:

- Internet companies, like numerous other start-up companies, generate losses or symbolic profits in the beginning of their activities, which results from high marketing costs that dramatically decrease their profits;
- Internet companies develop at a very fast rate: the successful ones increase their revenues severalfold or more in the early phase of development;
- The future of internet companies is very uncertain.

Apart from the most typical features of internet companies such as generating losses, high development dynamics in the first phase of existence and an uncertain future, some authors also point to several other characteristics. The internet industry as a whole is in an early stage of development so a precise description of the operational characteristics it would obtain in the maturity phase is very difficult. In other words, the economics underlying the internet companies' individual models of development so far has not been fully explored and it may only be a subject of speculation. Analysts have been dealing with the problem of not fully tested development models⁴.

It is also important to note that internet companies have a development model with a relatively high level of operational leverage, i.e. a heavy fixed-cost based structure. Typical internet companies need to achieve significantly higher sales than those operating in traditional industries to cover their fixed costs (i.e. achieve their break-even point). On the other hand, the higher the operational leverage, the higher the risk of a given venture. The reduction of operational leverage is supported by the dynamic development and mergers of internet companies as well as by other factors. Economies of scale can be achieved in this way, leading to a decline in fixed costs per unit sold.

Simplified valuation methods such as the P/E method or the P/R method are useless in cases when there are no profits or when the revenues rise dramatically fast. Instead of the above, some analysts suggest the use of such parameters as the number of customers or revenues 3 years ahead for multiple valuation. However, such an approach is incorrect as speculations on the future understood as three or five years ahead from the moment of valuation are simply not very useful in a situation when the dynamics continue to be very high over the next 10 or 20 years. Besides, simplified methods do not take into account the specifics (unique character) of individual companies.

One of the best methods of valuing internet companies is the return to economic fundamentals and application of the traditional method of discounted cash flow, which unambiguously separates real investment expenses and investment costs accounted for in time according to accepted (usually arbitrary) accounting principles. Also the lack of historical data and various multiplication methods underlying the realization of profits are not that problematic. The above stems from the fact that the DCF method based only on forecasts of profits (losses) allows to reveal the real price of the companies creating value but generating losses in their first years of operations. The DCF method does not eliminate the need to make some difficult predictions about the future, nevertheless it treats the issues of extremely high growth rates and uncertainty consistently.

According to some analysts, the DCF method has one, yet crucial disadvantage. It is pointed out that several assumptions about the future have to be made which are difficult to justify. It should be said however that other methods used to value internet companies also require assumptions that are difficult to verify. On the other hand, the advantages of the method in question are: incorporating risk (reflected in the cost of capital), avoiding distortion resulting from various accounting principles, independence from current market appraisal, taking into account future investment needs.

To value internet firms we may specify two types of clients: one-deal customers and relation oriented customers. A company's value is regarded as a sum of values of one-deal and relation oriented customers according to the following formula⁵:

$$VLV = VST + VCR$$
,

where:

VST - value of one-deal customers,

VCR - value of relation oriented customers.

In case of one-deal customers, CLV (Customer Lifetime Value) will be equal to the profit from the single transaction, therefore it is necessary to assess the number of transactions carried out by non-registered users or registered users who carry out no more than one transaction, average revenues and costs related to the single transactions. The forecasted profit from a single transaction with a one-deal customer can be estimated on the basis of historical data, e.g. average values from the past-period transactions. The next step is forecasting the number of transactions with one-deal customers. The best way is to use the forecasts made by the company's management. Typically the management possesses the most credible data related to sales forecasts. In case of start-up companies and new markets using models and external experts is not credible due to the lack of knowledge related to the specific markets.

A new client is profitable only if the future discounted cash flows are higher than the acquisition cost. To calculate CLV we should estimate retention and churn rates. These rates represent the percentage of clients retained and clients lost in comparison to the previous period.

Based on the overview of recent academic research on the valuation of internet firms Jansen and Perotti draw the following conclusions⁶:

- 1. Traditional accounting data remains important for valuing internet companies however the link between accounting numbers and Internet valuation is tenuous at best;
- 2. Web traffic is not a major value driver for internet companies;
- 3. Financial Analysts stimulated the overvaluation of internet stocks;
- 4. New valuation factors deem unsustainable;
- 5. New approaches to valuing internet stocks in reality are not new.

3. The issue of probability distribution regarding internet companies and other companies in the "new economy"

The probability distribution with an axis dividing it into two identical parts is a symmetric distribution. The axis of symmetry intercepts the x-axis in a point that is the mean of a variable and divides the area beneath the curve into two identical parts. Usually symmetric distributions have one maximum but also distributions with two or more maxima can be come across as well

as U-shaped distributions, i.e. with one minimum. One of symmetric distributions with one minimum is for instance the normal distribution – a symmetric distribution with fixed kurtosis (i.e. concentration of the variable around the mean). Every normal distribution is a symmetric distribution but not every symmetric distribution is a normal distribution.

An asymmetric distribution exists when the perpendicular line to the x-axis derived from the point where the frequency curve attains maximum, divides the area below the curve into two non-identical parts. The bigger the disproportion between the two parts, the bigger the asymmetry of the distribution.

The distribution whose frequency curve has two maxima is called a bimodal distribution. If the frequency curve has more than two maxima, the distribution is multimodal.

It should be noted here that asymmetric distributions (and extremely asymmetric distributions in particular), bimodal and multimodal, must be analyzed and described in a different way than symmetric and normal distributions for the properties of those distributions are different⁷.

With reference to the companies operating in traditional industries (sometimes referred to as the "old economy") probability distributions are usually single modal distributions, mostly similar to the normal distribution. Obviously, it is questionable which measure should be used to analyze the level of risk. Mostly it is the sales and net profit, although other measures may be considered as well, e.g. EBIT (i.e. gross profit plus interest). The lower the risk related to the company, the lower uncertainty related to the level of future sales and profits, and as a result, the leaner the distribution. With reference to secure companies operating in the traditional sector of the economy (e.g. power stations, waste utilization) typical probability distribution is a lean distribution similar to the normal distribution (see Figure 1).



Fig. 1. Probability distribution in a typical low-risk company operating in the "old economy" Source: own study.

A high-risk company from the "old economy" (e.g. an integrator of computer systems) will still have a normal distribution but it will be flatter than that of a secure company. Probability of the profit or loss different from the average is higher here than in the previous example, which is observed as the flatness of the distribution (see Figure 2).



Fig. 2. Probability distribution in a typical high-risk company operating in the "old economy" Source: own study.

At the same time, fast developing companies in the "new economy" sector, usually called technological companies, have a distribution which by no means resembles the normal distribution. It is not a strongly flat normal distribution but rather a bimodal – and sometimes even multimodal – one. In such a distribution the probability of occurrence of more extreme scenarios – both optimistic and pessimistic, which would be scarcely probable for a traditional company – is higher than the occurrence of the initial, neutral scenario, placed in the centre of the probability distribution curve⁸. Such a situation is presented on Figure 3.



Fig. 3. Exemplary probability distribution in a typical internet company Source: own study.

4. Proceeding of valuing internet companies with the DCF method

The application of the DCF method to value internet companies consists in following three subsequent activities-phases:

- 1. Analysis of future conditions and return to present situation;
- 2. Setting weights according to expected probability;
- 3. Use of classical analytical techniques to link future scenarios to present situation of the company in question.

When valuing internet companies and other technological companies jointly referred to as high growth companies one should not focus on current profits or losses. The analysis – unlike in routine DCF analysis – should be started with considerations on the future condition of the industry and company assuming an evolution from the present, extremely high interest rates and relatively unstable conditions to moderate (average) interest rates and relative stability in the future. The future condition should be defined by such measures as the average income per customer, return on gross sales, final penetration level. Since the internet industry is among the very young ones, achieving relative stability can take place no sooner than in 10–15 years.

The aim of the first phase is not to define precisely **what will happen** to internet companies in 10–15 years but to describe extensively **what may happen**. It means the preparation of various scenarios, in which different assumptions are made concerning such variables as, for instance, the number of users, the number of exposures, promotion outlays, stock level, investment outlays, return on gross sales. Variables characteristic of a given type of company are also very important since within this group there is wide differentiation as to the activities and their forms, technologies applied, target consumer group, sales and marketing techniques, etc.

A question arises here about the number of scenarios required for the valuation of internet companies. It is important to note that when valuing a company operating in the traditional economy it is advisable to draw up two or three scenarios for a greater number seems to be unnecessary⁹. In the case of internet companies we are concerned about the abnormal distribution of probability (it is not even similar to the normal distribution). It means that completely different results may be obtained with bi- or multimodal distributions. That situation justifies or even requires the use of more scenarios. While valuing companies from traditional industries, the scenarios are additional interesting tools in risk analysis, in the case of internet companies every single scenario participates in the eventual value estimation through a probability level ascribed to it (by an analyst or a group of analysts). When valuing an internet company the company's value is estimated as the mean of values obtained in all the scenarios weighted with

the probability level ascribed to each scenario. Therefore each scenario has an impact on the value of the company.

Below exemplary results of scenario analysis in valuation of a hypothetical internet company ABC Plc. have been presented. Seven scenarios were drawn up on the basis of different assumptions regarding the development of the industry as well as the company itself. In variants A, B and C it was assumed that in the year 2015 the market where the company operates would be worth (in terms of sales) nearly USD 9,000 million, while in variants D, E, F and G the total value of sales of all the entities in that market was assumed at the level of over USD 17,000 million. Individual variants differ in terms of assumptions concerning their market share, realized profitability rates and other parameters which were omitted in Table 1.

Scenario – company ABC in 2015	Sales in USD million	Return on sales* in %	DCF in USD million
Scenario A: 35% domestic market share	3,000	16	2,850
Scenario B: 30% domestic market share	2,140	10	1,220
Scenario C: 20% domestic market share	1,700	8	750
Scenario D: 15% domestic market share	2,570	7	1,430
Scenario E: 10% domestic market share	1,700	6	660
Scenario F: 5% domestic market share	850	5	260
Scenario G: 2% domestic market share	340	5	140

Table 1. The results of an exemplary scenario analysis in valuation of a hypothetical internet company ABC Plc

* Return on sales is the relation of gross profit plus interest to sales.

Source: own study.

The key phase in valuing internet companies is ascribing appropriate probability levels to individual scenarios. It is a phase which arouses relatively the most controversy since it concerns development scenarios for an extremely dynamic industry for which there is no reasonable reference or analogy in the past. The probability levels ascribed to individual scenarios are therefore naturally biased with a large amount of subjectivity. A partial solution to the problem is basing final estimates on the opinions of expert teams. The teamwork usually leads to better results contributing to the rationalization of extreme views.

Below estimated probabilities of individual scenarios have been presented along with expected value, which in this approach is ABC's income-based value.

Scenario – company ABC in 2015	DCF in USD million	Probability in %	Expected value
Scenario A: 35% domestic market share	2,850	15.0	427.5
Scenario B: 30% domestic market share	1,220	20.0	244.0
Scenario C: 20% domestic market share	750	15.0	112.5
Scenario D: 15% domestic market share	1,430	5.0	71.5
Scenario E: 10% domestic market share	660	10.0	66.0
Scenario F: 5% domestic market share	260	20.0	52.0
Scenario G: 2% domestic market share	140	15.0	21.0
Total		100.0	994.5

Table 2. Realization probability of individual scenarios and valuation of a hypothetical internet company ABC Plc

Source: own study.

It is worth to notice that the riskiness of individual scenarios is incorporated in the calculations of expected value. Therefore the cost of equity used to discount cash flow for every scenario should not be increased by any additional premium. The cost of equity can be estimated on the basis of the risk-free interest rate, the average industry risk index (beta) and market risk premium.

The last phase in valuing internet companies is relating future scenarios to the current condition of the companies being valued. It is the micro and strategic analysis skills that play the crucial role here and the most advisable tool is the so-called customer-value analysis. In that analysis one focuses on several key factors determining the profit (loss) of the company in question. In the case of retail internet companies (such as for example the American company Amazon) we may point to five factors¹⁰:

- 1. Average annual revenues per customer, as well as the income from advertisements and from retailers leasing some space in the portal to sell their products;
- 2. Total number of customers;
- 3. Return on sales per customer in percent (excluding costs of acquiring customers);
- 4. Average cost of acquiring a customer;
- 5. Customer churn ratio (share of customers lost every year).

Customer-value analysis can reveal significant economic characteristics that are not reflected in present profit (loss) and which play the most important part in the company's development. For instance, if the company has identical characteristics as its rivals, or even higher revenues and return on sales than the rivals, it does not imply that it will become the market leader. It may turn out that the company in question has a very high customer churn

ratio and, consequently, higher costs of acquiring customers than its rivals. After carrying out the extrapolation of present characteristics from customer-value analysis it could turn out that the company has much worse prospects than its competitors despite illusive similarities and generally good opinions among the market participants.

5. Emotion-based valuation?

The probabilities ascribed to different development scenarios for internet companies are the key to achieving a realistic valuation. However as evidence from the dot.com bubble shows, the analysts' and investors' expectations regarding the internet companies' performance can be greatly exaggerated as they are often based on subjective ideas. Breakthrough technologies or business ideas such as the recently emerging social networks of which Facebook is an unquestioned leader can have extremely high market valuations because the investors simply believe in their success despite the lack of measurable criteria. It was recently reported that Facebook might be valued at about USD 100 billion at its IPO which could take place in the first quarter of 2012. The above value is nearly a hundred times higher than Facebook's revenues reported in 2010¹¹. In this context Yahoo!'s example should be quoted as back in 2000 it was said to be "the future of the internet" and valued at around USD 150 per share. Presently Yahoo's! valuation is at the level of approximately USD 15 per share and during the last 11 years the company has not paid a single dollar in dividend¹².

6. Distribution of internet companies' valuations

Apart from high volatility and the investor's propensity to accept very high valuations of internet companies in general in comparison to other sectors of the economy, another interesting characteristic of the internet sector can be found. An empirical analysis conducted in 1999 by M. Mauboussin showed the existence of a mathematical relation between company capitalization and rank in the internet sector. While on a normal scale one could observe a very high concentration – only several companies had high valuations while the vast majority were valued relatively low – there was a precise trend when the scale was switched to a logarithmic one. The results of the said analysis were presented below.



Fig. 4. Results of empirical analysis – relation between valuation and company rank in the Internet sector

Source: Ip (1999).

The above further proves that the internet sector is an example of a winner-takes-it-all market. The relation is of little practical use as it could only be used to determine whether internet stocks were correctly valued relative to each other and not that the sector as a whole was valued realistically. It could however point to the fact that the internet sector as a whole might not be as overvalued as many analysts believe it to be as the results are heavily distorted by just a handful of companies while the majority are deemed to be worth little¹³.

7. Real option valuation

One of the latest techniques of valuing internet companies with large growth potential and high risk is based on the Black-Scholes option valuation model. Schwartz and Moon (2000) and Perotti and Rossetto (2000) believe that internet companies have the characteristics of a call option since they have large growth potential upside and limited downside potential (bankruptcy). Just like internet companies options are often claims on highly uncertain outcomes. Under this approach an internet company can be considered as a stream of cash flows and an embedded set of options – opportunities that eventually will or will not be taken. The valuation of internet companies as real options involves several assumptions: the options concern real (non-financial, non-traded) assets; uncertainty is defined as the unavoidable randomness of the external environment influenced by a multitude of factors and can be only partially controlled by managerial actions. Such uncertainties cannot be properly addressed in traditional valuation models (such as DCF) as they usually use a single expected value of the future cash flows¹⁴. Furthermore different discount rates ought to be used for different options embedded in the project (mainly growth options but other as well, e.g. the exit option) and in different periods as the level of systematic risk may change over time. The above is particularly true for internet ventures, which tend to be highly sensitive to the current state of the economy while in initial development stages and much less sensitive to the business cycle as they mature. Another reason why DCF could undervalue internet companies is the fact that traditional methods tend to overlook their flexibility in making investment decisions at certain times in the future¹⁵.

Examples of real options present in the internet sector include the following¹⁶:

- option to defer the management has the opportunity to refrain from investing until market conditions seem favourable,
- staged investments the option to re-evaluate and/or abandon the investment at each stage,
- option to abandon a new product can be abandoned if the market response in unfavourable,
- option to switch management can choose a different allocation of resources (e.g. marketing budget) between products,
- growth option –future growth opportunities in the form of new products or processes, access to markets or strengthening of core capabilities,
- multiple interacting options projects involve a collection of various options both put and call types. Values can differ from the sum of separate option values because they interact.

Real options can be valued using the standard Black-Scholes formula used for valuing financial options, however the variables need to be assigned different interpretations. For example when valuing a growth option concerning a specific project that could be undertaken in the future (e.g. at the moment when its NPV based on current forecast becomes positive) the following input data is required (corresponding variables for financial options are given in brackets):

- X expenditure to acquire assets (exercise price in case of the financial option),
- S value of the operating assets to be acquired (underlying asset price),
- T length of time the decision may be deferred (time to expiration),
- σ^2 riskiness of the operating asset (variance of stock returns),
- r time value of money (risk-free rate of return).

Conclusions

According to many analysts, the future of most internet companies means full success or complete failure. In this industry moderate states are untypical, which implies that being average is not an appropriate behaviour. A much better solution is an attempt to describe in detail the positive and negative scenarios of the company's future development. It is advisable to draw up a number of scenarios and/or different real options embedded in the projects. Also particularly "bold" scenarios – both in positive and negative sense -are not to be omitted (at the end of 1996 the consensus of sales forecasts for Yahoo! for 1998 amounted to USD 60 million while in reality the sales were USD 245 million; there are also numerous examples of companies that realized much lower profits than expected)¹⁷. Therefore regardless of whether the forecasts turn out to be precise or not, the likelihood that the profits/losses of internet companies are close to those expected in the initial, basic scenario is relatively low. It implies that those high-risk, fast-growth companies have a bimodal or multimodal probability distribution contrary to the majority of entities operating in the traditional economy, whose probability distribution is the normal distribution (or a similar one)¹⁸.

All in all, there is no convincing research regarding new valuation techniques and/or value drivers for internet stocks. Web traffic has an important impact on predicting future sales and thus influences the expectations regarding short- and long-term profitability but has no consistent direct impact on the valuation of internet stock. From among strategic alliances, granting employee stock options and changing the company name into dot.com, only the latter had an influence on the valuation of internet stocks. This suggests that it is rather irrational exuberance before the crash than extreme optimism. Extreme optimism did play a role though. It is generally agreed that internet stocks have many uncertainties – e.g. volatile revenue dynamics, cash flows and earnings- and it is a business that has little historical track record. However, after the burst of the internet bubble it has become obvious that the expectations (even those expressed by financial analysts) were too optimistic and that they were the main reason for the overvaluation of internet stocks. Traditional valuation techniques have not lost any of their relevance. It is just a matter of using the correct parameters and presenting them in a correct matter in the financial accounts to make the valuation of internet stocks feasible¹⁹.

The dynamic development of the internet industry and the lack of appropriate statistics that would enable deeper analyses raise some objective difficulties related to the valuation of internet companies. The attempts made so far and suggested solutions have been the subject of many polemics. But the needs of valuation practitioners are obvious: it is necessary to work out methods enabling faster, more reliable and more precise estimates of the value of internet companies and other companies operating in the "new economy" area. The search for such solutions will definitely be continued²⁰.

Notes

- ¹ Wiśniewski, Zarzecki (2000), p. 100.
- ² Ibidem, p. 101.
- ³ Desmet, Francis, Hu, Koller, Riedl (2000) Number 1.
- ⁴ Pająk (2000), p. 14.
- ⁵ Kossecki (SSRN-id1478713).
- ⁶ Jansen, Perotti (SSRN-id310659).
- ⁷ See Krzysztofiak, Urbanek (1981), pp. 157–159, Batóg (2001), pp. 18–24.
- 8 Pająk (2000), p. 14.
- 9 See Zarzecki (1994), pp. 27-28.
- ¹⁰ Desmet, Francis, Hu, Koller, Riedl (2000).
- ¹¹ Carney (2011).
- ¹² Facebook'svaluationnowherenear \$ 100 billion: Analyst, CNBC.com, June14th 2011.
- ¹³ Ip (1999).
- ¹⁴ Jansen, Perotti (SSRN-id310659).
- ¹⁵ Athanassakos (2007).
- ¹⁶ Jenter (2003).
- ¹⁷ According to the research carried out by Morgan Stanley on a sample of 1243 technological companies, which conducted their initial public offerings, over 80% of the value generated by those companies in the last decade was generated by as little as 5% of the companies. Cited after: Desmet, Francis, Hu, Koller, Riedl (2000).
- ¹⁸ See Pająk (2000), p. 15.
- ¹⁹ Jansen, Perotti (SSRN-id310659).
- ²⁰ The issues of methods of business valuation is the subject of the book: Zarzecki (1999).

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