ESTIMATION OF THE INVESTMENT ATTRACTIVENESS OF COMPANIES USING MULTIPLES THAT ACCOUNT FOR INDUSTRY SPECIFIC FACTORS

Evgeniy Ageev

Abstract*: The article is devoted to the issue of using financial multipliers to estimate the value of a company. In our research we identified the industries that account for more than 50% of Gross Domestic Product. We took the companies with publicly available information. Then we used multicriteria Muchnik's model to identify promising companies and receive the required sample. At the final stage, we used a comparative approach for the evaluation of companies in these industries. The results of experiments showed the essential advantage of the proposed method. Notably, we marked multiplier, which were most likely gave a more realistic evaluation of companies. The paper reflects the results of Bachelor research.*

Keywords*: financial multiples; company valuation; multicriteria Muchnik's model; comparable company*

ACM Classification Keywords*: I.2.m Miscellaneous*

Introduction

1.1. Problem setting

Determining the fair value of company is one of the major issues of corporate finance. Problem arises because there is no single method of assessment of companies as each company, just as any person, is individual. Problem requires a solution, because accurate assessments are need for mergers and acquisitions in order to determine the profitability of various investment strategies, in determining further management etc.

Traditionally there are three approaches to evaluate the companies:

1. The income approach;
2. The cost approach;
3. Market-based approach.

Income approach is the most labor-intensive approach in business valuation.

$$V = \sum_{t-1}^{t=n} \frac{CF_t}{(1+r)^t}$$

V – value of the asset;

CF_t – cash flows for the period *t;*

n – lifetime of the asset;

r – discount rate.

The cost approach is linked with the assessment of individual assets. Assets are summed to obtain the value of the firm.

The market approach is used in circumstances where there aren't insufficient data for the applying approach of discounting cash flow, when you need quick assessment [Damodaran, 2004].

The value of most assets is based on the price of a similar asset in market be it a house or a stock. In contrast to the income approach which aims to search for intrinsic value market-based approach is based on the market value. It is assumed that on the average market has well-defined stock prices, but makes mistakes, when created value of individual stocks. In our research we assume that use and a comparison of multipliers will reveal these errors. Can help determine which companies are undervalued. It's the purpose of any private investor.

1.2. Related work

The questions related with the general analysis of investment market are considered in the publications [Brealey, 2003; Copeland, 2005]. The assessments of investment attractiveness of different companies are reflected in the works [Alford, 1992; Baker, 1999; Barker, 2001; Fairfield, 1994].

The peculiarities of the Russian financial market are described in [Ivashkovskaya , 2008; Teplova, 2011]. All these publications proved to be the basis for the proposed method.

It should say that in most studies, analysts looked at the comparable firms that were in the same industry. They [Lie E., 2002; Park Y., 2003; Liu, 2002] have identified a set of specific multipliers that describe the factors of value companies. They assumed that between industries there are significant differences that affect business valuation. This is due to different income and capital intensity of different industries as well as different expected growth, and many other factors (company size, the degree of openness and protection of shareholders and etc.).

Method

2.1. Hypothesis

Need to check which method is suitable for public companies on the Russian market. We put forward the following hypothesis: *for each industry can be applied a multiplier which could help obtain an estimate of company's value with the smallest error.*

To confirm the hypothesis we analysed of public companies which located in Russia. For this purpose we used the annual reporting accounts of companies in 2010. In 2010 price of oil and gas which is exported from Russia, returned to normal level and Russian ruble has stabilized and strengthened. According to UNCTAD (http://archive.unctad.org/ru/docs/dom2011d1_ru.pdf) in the year 2010 Russia (in terms of attracting foreign direct investment (FDI)) was second after China among the BRICS countries. This year demonstrated the extent to which the Post-Crisis Economy of the Russian Federation is attractive for investors. To proceed to proof of hypothesis it is necessary to determine the sample. To begin with, we had to consider the industry which adds up to more than 50% of GDP. We have identified industries with the best data and with a large number of companies.Those are "Wholesale and retail trade" and "Transport and communications". Next, we used data on issuers which has been collected with help of System of Professional Analysis of Markets and Companies (SPAMC). Only public companies were subject to research. The next step was to apply to apply grouping.

2.2. Muchnik method

The algorithm of Muchnik's model implements a method of sequential sampling which allows us to solve the problem of multicriteria choice. The method assumes that the criteria is ranked according to importance. The model is as follows:

- lower level are the parameters which describe the activities of companies (candidates) on investments;

- medium level are private criteria, the following parameters or derivatives;
- upper level are integral criteria or utility function.

When evaluating companies for a given parameter we set a threshold which will separates interesting companies from the rest ones. Conditionally we assigned index 1 for a company if it satisfied the parametrized restriction and – 0, if it is not satisfied. We summarize the indices parameters of private criteria and commend the company.The algorithm is as follows:

1. choose the best company for the first criterion
2. choose the best company for the second criterion obtained from the best companies
3. selected the best of the third criterion of the companies received in the previous step, etc.

What do we have? We have the most promising group of companies. Then we remove these companies from the general list and repeat the algorithm for the remaining companies to get the next group. The process is repeated as many times as we want, depending on the desired number of groups of companies. The *age* and *size* of the companies have been chosen as the criteria. Age of the companies had to be more than five years, so we are warned by young companies. They are not yet accustomed to the specifics of the industry and are therefore at risk. Size of the companies were determined by the level of sales revenue for 2010 - more than 1 billion rubles, ie large enterprises.

Next, go to the assessment of companies on the given criterion. The essence of the criterion is an indexation of the companies. The specified index is the sum of the index companies in all the parameters which make up the selected private criterion. Select the criterion of "Return", consisting of three derivatives parameters:

- *Return on sales* (ROS), % - shows the share of net profit in the sales of the business. Calculated by the formula:

$$ROS = \frac{Net\ profit}{Net\ sales}$$

- *Return on assets* (ROA), % - shows how much profit has been generated of each monetary unit, embedded in the assets of the organization. Calculated by the formula:

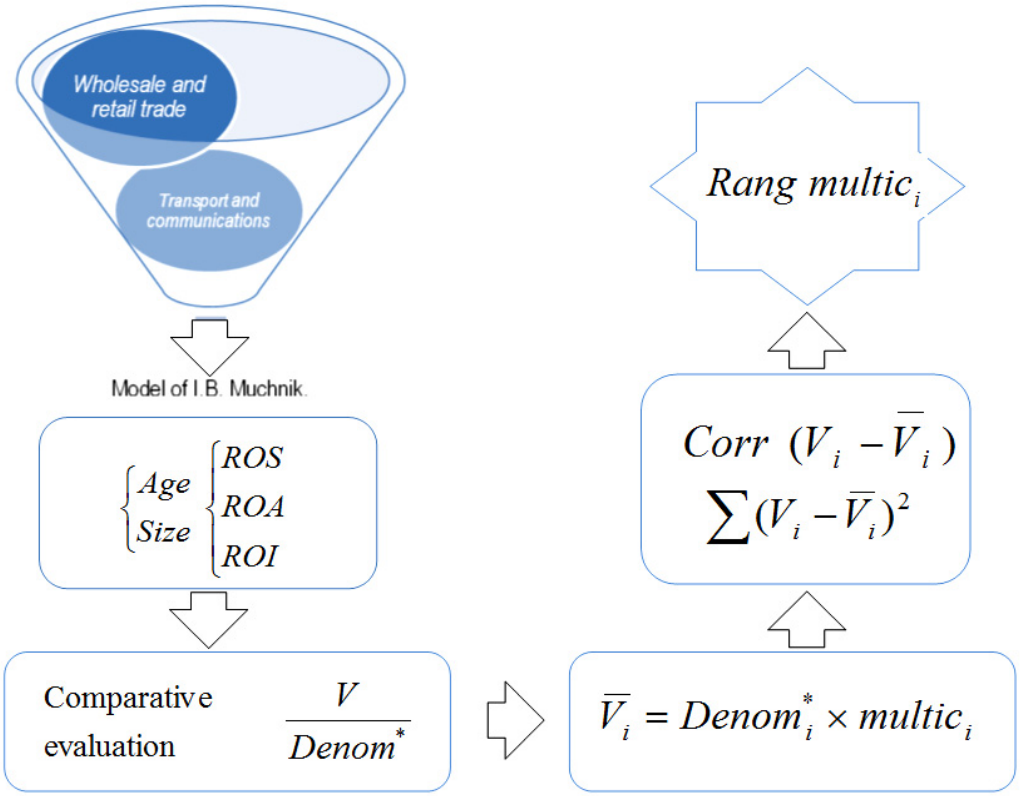
$$ROA = \frac{Net\ profit\ for\ the\ period}{Average\ assets\ for\ the\ period}$$

- *Return on investment* (ROI), % - shows how much money the company needed to produce every unit of profit. Calculated by the formula:

$$ROI = \frac{Net\ profit}{Own\ capital + Long - term\ commitment}$$

Experiments

3.1. Selection of companies



After application the method of selection and grouping we formed four groups companies (A, B, C, D). We selected as a training sample group A. We calculated the value of the company multipliers and considered them as true for the entire industry. We calculated based on these multipliers estimate the market capitalization and enterprise value of the remaining companies [Frykman, 2003]. The results were compared with those which were counted in advance. To identify an offset value in the valuation of companies we estimated the deviation in absolute value, standard deviation and correlation. We have compared the values of deviations and assign indexes to appropriate multiples.

Multiplier which has received the least amount of "points" is considered the best for the selection as it gives the smallest error in the valuation. We increased our training sample and added the companies from group B. The newly calculated values of the multipliers in this sample will be assumed true for the industry. We obtained a "new" value of market capitalization and enterprise value for the remaining companies. We re-estimated the error of the group.

The training sample is expanded by adding the companies from group C (ie A + B + C).

Again, acting in accordance with our logic and present the results in tabular form (Table 1, 2).

3.2. Interpretation of results

Thus, combining the results together we can talk about the identification of a specific multiplier which provides the smallest error. It's empirically determined that the same multipliers have a different error when assessing the value of companies in each industry. The total we have considered 367 companies.

The hypothesis was confirmed*: for each industry can be applied a multiplier which could help obtain an estimate of company's value with the smallest error.* We were able to confirm this hypothesis using the results by industries of "Wholesale and retail trade" and "Transport and communications". For each of these industries was determined a multiplier which found undervalued companies with the lowest error. For the industry "Wholesale and retail trade" the P\E multiple is the most efficient, and for the industry "Transport and communication" – a multiplier EV / EBIT.

Table 1. Results for the industry "Wholesale and retail trade"

Multiples	1*	2*	3*	*Sum*	Place
P/E	1	2	2	*5*	1
EV/S	5	5	5	*15*	5
EV/B	2	1	4	*7*	2
EV/EBITDA	3	3	1	*7*	3
EV/EBIT	4	4	3	*11*	4

Table 2. Results for the industry "Transport and communications"

Multiples	1*	2*	3*	*Sum*	Place
P/E	3	4	4	*11*	4
EV/S	5	5	5	*15*	5
EV/B	2	3	1	*6*	2
EV/EBITDA	4	2	3	*9*	3
EV/EBIT	1	1	2	*4*	1

Conclusions

It should be noted that the analysis of the two industries can demonstrate the efficiency of the proposed method on the example of Russian industries.

We can shortly formulate following results:

- We have set a problem of determining a multiplier to estimate the fair value of companies as a problem of multicriteria selection.
- This problem was resolved on the basis of proposed method which contains *Muchnik's model.*

Application of the results:

- Proposed method could be used to predict the value of companies.
- Investors can also use this methodology to identify undervalued companies.

Bibliography

[Alford, 1992] Alford A.W. The Effect of the Set of Comparable Firms on the Accuracy of the Price Earnings Valuation Method. Journal of Accounting Research 30. Study 1992: 94. 108p.

[Baker, 1999] Baker M.R., Ruback R., Estimating industry multiples. Working Paper, Harvard Business School, Boston, Study 1999.

[Barker, 2001] Barker R. Determining Value: Valuation Models and Financial Statements, London: Prentice Hall, 1st edition , 2001.

[Brealey, 2003] Brealey R., Myers C. Principles of Corporate Finance, The McGraw−Hill Companies, 2003.

[Copeland, 2005] Copeland T., Koller T., Murrin J., Valuation. Measuring & managing. The value of companies. New York, 2005.

[Damodaran, 2004] Damodaran A. Investment Valuation: Tools and Techniques for Determining the Value of Any Asset, Wiley Finance, 2004.

[Fairfield, 1994] Fairfield P.M. P/E, P/B and the Present Value of Future Dividends // Financial Analysts Jpurnal; Vol. 50 Issue 4, Study 1994: 23. 31p.

[Frykman, 2003] Frykman D., Tolleryd J. Corporate Valuation, Fin Times Prentice Hall, 1st edit; 2003.

[Ivashkovskaya , 2008] Ivashkovskaya I., Kuznetsov I., Adjustments to the market multiples for valuation in emerging markets: empirical research // Audit and Financial analysis, №5, 2008.

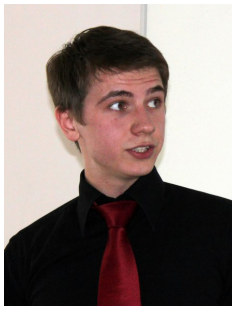
[Lie , 2002] Lie E., Lie H. J. Multiples Used to Estimate Corporate Value // Financial Analysts Journal, Vol. 58 Issue 2/ Study 2002: 44. 54 p.

[Liu, 2002] Liu J., Nissim D., Thomas J. Equity Valuation Using Multiples, // Journal of Accounting Research 40. Study 2002: 135. 172 p.

[Park, 2003] Park Y.S., Lee J.-J. An empirical study on the relevance of applying relative valuation models to investment strategies in the Japanese stock market // Japan and the World Economy, Volume 15, Issue 3. Study 2003: 331. 339 p.

[Teplova, 2011] Teplova T. Investment, Moscow.: Yurait, 2011.

Authors' Information



Evgeniy Ageev *– Bachelor, The Russian Presidential Academy of National Economy and Public Administration, Prosp. Vernadskogo 82, bld. 1, Moscow, 119571, Russia; Moscow Institute of Physics and Technology; Institutslii per. 9, Dolgoprudny, Moscow Region, 141700, Russia;*

e-mail: eageeev@gmail.com

Major Fields of Scientific Research: financial multiples; stock markets, econometrics.