SENSITIVITY ANALYSIS APPLICATION IN THE COMPANY VALUATION: THE CASE OF DISCOUNTED CASH FLOW METHOD

[a]ELENA DRABIKOVÁ, [b]JOZEF SVETLÍK

[a]*Technical University of Košice, BERG Faculty, Institute of Control and Informatization of Production Processes; Boženy Němcovej 3, 042 00 Košice, Slovakia; email: elena.drabikova@tuke.sk*
[b]*Technical University of Košice, Faculty of Mechanical Engineering, Department of Manufacturing Machinery; Letná 9, 040 01 Košice, Slovakia; email: jozef.svetlik@tuke.sk*

Abstract: Valuation of the company or its parts is an important challenge of any conducted business. The presented paper discusses this topic with emphasis on selected approach for manufacturing company valuation that is discounted cash flow method. The analysis and evaluation concerning stated method are made. The principal objective is determination of the most influential variable impacting development of company value. Subsidiary aim involves effort to identify force of every examined variable on resulting company value change. In this connection, the crucial factors are reviewed. These are namely future free cash flow, weighted average cost of capital and growth rate in future free cash flow. According to numerous empirical studies dealing with company valuation issue the sensitivity analysis is picked as analytical tool for research along with other performed computations. Investigation leads to conclusion that the most dominant variable emerging within discounted cash flow method for company valuation is weighted average cost of capital. Eminent attention should be thus paid to this factor. In the context of further goal, the future free cash flow keep the second place and the growth rate in future free cash flow the third one. Moreover, the paper offers potential for next research.

Keywords: Company valuation, discounted cash flow method, sensitivity analysis

1 Introduction

The company valuation issue appears, in considering the current global and not only economic trends, highly topical. Practice shows that enterprise sector dynamism requires greater attention in relation to the valuation of the companies. There are manifold reasons for such a move.

The findings resulting from the valuation realization are primarily desired for the sale or purchase of company (PriceWaterhouseCoopers, 2015). Other valuation motives include acquisitions, mergers, enterprise reorganization, preparation of a strategic plan or carrying out a capital investment such as building a new plant. The need for valuation of the whole company or its part is present also during deciding to invest into research and development, introducing a new product on the market, selling respectively buying intangible assets which may be trademarks. Not least, the reasons are analyzing the value of the equity share, obtaining funding for the project, establishing a joint venture, determining the value of device, property or trademark for business as well as legal purposes, recapitalization of the company, sale of shares, demonstrating adequacy of pledged (in relation to banking and other financial institutions) or ensuring compliance with the requirements under accounting standards as at national same as transnational level.

Incentives listed above represent, in fact, taking a positive attitude to initiate the process of company valuation. This applies to company valuation justification and necessity connected with solving the real company's tasks, too. Mentioned motives are only a part of a large set of other potential incentives leading to the valuation realization. In addition, all of them occur in business practice very often.

The need for high-quality and transparent data disposition in the context of the valuation of assets, liabilities, but likewise company as a unified entity has currently a growing trend (Ernst & Young, 2014). Devoting a greater interest in the company valuation matter is important to satisfy the more stringent legislation relating to the regulation of capital markets and financial reporting, as well.

The company valuation commencement should be preceded by a detailed understanding what is actually an object of valuation and what exactly the result of that effort should be. Therefore, it is first necessary to formulate the main basis for company valuation.

2 Literature review

Models used for company valuation have been an objective of numerous empirical studies more recently. Dissimilarity in estimations using different models for company valuation explored Lundholm and O'Keefe (2001). The attention was concentrated on the discounted cash flow model and the residual income model. Research stimulus was a contradiction between consistent fundamentals of the both models and inconsistent valuations gained by practitioners and researchers. Authors claimed the appraisals were the same by application of the residual income model and discounted cash flow model in the situations with correct models practice. Consequently, the proper execution problem was identified.

Demirakos, Strong and Walker (2004) undertook to find out which valuation models financial analysts typically apply. They described the valuation practices through exploring 104 reports prepared by analysts. The variant valuation models analysis was adopted. Substantial value characteristics were the crucial target in view of the fact that analysts forecast them and subsequently predictions are implemented to the company valuation. Hypothesis testing showed that analysts' preferences appeared in cash flow based models and earnings based models. Equal findings reached Imam, Barker and Clubb (2008). Considerably significant was the discounted cash flow method. Discounted cash flow model yielded to the investment analysts an inherent flexibility and complex high reliability.

Popularity and frequent use of the discounted cash flow approach confirmed Imam, Chan and Shah (2013) in the recent study. They verified European investment analysts' inclination to the several valuation models. They came to the conclusion that earnings multiples and the discounted cash flow technique were retained as the most often implemented. Likewise Cornell (2013) denoted discounted cash flow method mostly as the choice number one in valuation practice in his paper. However, he declared according to the analysis he completed that the residual earnings approach, representing related income method to the discounted cash flow method, should not be underrated. Cornell highlighted satisfying resistance to parameters' variance, economic indisputability and stabile status of this technique. The question about uncertainty in the valuation established French and Gabrielli (2005). The aim was to solve the integration of some uncertainty types to the discounted cash flow model. Account was taken of the fact that market, inputs and data uncertainty enter to the company valuation.

Analysts' cash flow forecasting reviewed DeFond and Hung (2003). Analysts chose to forecast firm's cash flows in the case when parameters of the financial, accounting and operational nature led to the fact about cash flows benefit in clarifying earnings and considering company rentability. A forecast-cash-flow approach was in the interest viewfinder of various researchers. Lee (2003) in the framework of deciding on the right valuation method remarked that every forecast-cash-flow model is based on the same essential foundation. The focus was given to mentioned valuation methods category considering its major pros and cons. Lee discussed mainly discounted cash flow method from the group of methods based on cash flows prognosis. Summary indicated, among others, discounted cash flows valuations are suitable for international comparable, naturally taking into account particular applications.

Analyst reports scrutinized Asquith, Mikhail and Au (2005). They validated the analysts rendered the latest information in

every equity report and additionally explicated information published earlier. Further, there was not detected correlation between analyst accuracy and selected method for the valuation operations. In the context of cash flow reporting Sharma and Iselin (2003) explored rationality and benefit of reported cash flows. They identified a great helpfulness of the statement of cash flows. Sharma and Iselin favored the reasonability of the cash flow information disclosing. The cash flow reporting utility was sustained also by the confirmed assumption about accuracy. Interpretations considering the accrual information were less accurate than ones based on the cash flow data.

Kazlauskienė and Christauskas (2008) constructed a company valuation model relied on the company value drivers analysis. The categorization of the company value drivers and their adjustment were included. The substance stuck in the drivers influence on value in the valuation running. Proposed model provided not just a final company appreciation, but modeling and subsequent implementing of multiple factors alterations, too. Neifeld (2001) offered macroeconomic model design for valuation. The subject of the research was aimed to patents. Essential acquisition was in the equations forecasting the market share of services as well as products which underlie to patents. The income valuation thesis was applied to the annual net earnings covered by a patent. What is more, few extensions of the model were presented.

In relation with macroeconomic valuation model, the advisory paper was issued whose authors are Reddy, Agrawal and Nangia (2013). They suggested that overwhelming majority of the models for valuation is associated with microeconomic factors. The meaning of macroeconomic factors was highlighted in their study. Authors stimulated appreciation of the company over more frequent macroeconomic aspects usage. The proposal to incorporate the exchange risk, transfer risk, country risk and political risk was put forward. The research was dedicated to standard models, to reconstruction existing methods and to projection new ones. All company valuation approaches were applied to the specific industry sector. Examination included discounted cash flow technique with its reengineering. Lastly, to summarize the findings, comparison of the reviewed models was provided.

Practitioners Gilbertson and Preston (2005) appealed for dealing with the current challenges facing the valuers and valuation services. They took the opinion that thorough comprehension of the individual economic sectors and market segments is the key towards success of professional valuation. Moreover, authors of the study pointed out the trends, threats and opportunities of the valuation profession. Great weight was assigned to the expanding automation of the valuation process same as the products. The necessity to redefine valuation standards in accordance with the actual market requirements was underlined.

Research of Laswad and Baskerville (2007) was oriented to the connection between cash flows and fair-value earnings. They asserted the numerous academic and practical papers examine the importance of cash flow information. There exist many instances the demand to report cash flow statements is warranted by vision to enable evaluation of the earnings quality for cash flow information users. Findings declared correlation between cash flows and realized earnings presented within fair-value.

Cash flows on a quarterly basis were surveyed by French (2013). Discounted cash flow technique was investigator's interest. He supposed the right move is to elaborate classic discounted cash flow model into quarterly discounted cash flow model. Such modification allows, as he stated, calculations with current cash flows. Several useful valuation examples and discounted cash flow model conversions were yielded.

3 Research

As the realized empirical studies showed, the cash flow based models figure among the most common company valuation models. Even more, they are the most preferred in the vast

majority of cases. Favored one is the discounted cash flow method. Except for the eminent cluster of authors and analysts using discounted cash flow approach, there exists an argument (Fernández, 2015) about proper conceptual correctness related just to the methods based on cash flow discounting. These were the reasons for choosing discounted cash flow as a decisive method that was subjected jointly with specific data to further testing.

The value of company (V_C) is defined under the discounted cash flow method by following equation:

$$V_C = \sum \left[\frac{FFCF_t}{(1 + WACC)^t} \right] + \left[\frac{\frac{FFCF_t(1 + g)}{WACC - g}}{(1 + WACC)^t} \right] + NOA\,,\qquad (1)$$

where:
$FFCF_t$ is future free cash flow in period t,
WACC is weighted average cost of capital,
g is annual growth rate of future free cash flow,
NOA are non-operating assets.

Weighted average cost of capital is the discount rate in this instance. It expresses the weighted average of opportunity costs - value that investor sacrificed and could gain by investing to the similar investment. The WACC meets (Chaplinsky, 2000) assumed inflation rate, risk given by being in business as well as currency of the cash flow supposed to be discounted. In addition, the WACC should further encompass fitting target weights pertain to the next funding.

The equation introduced below characterizes weighted average cost of capital in more detail:

$$WACC = \sum \left[K_e \left(\frac{E}{V} \right) \right] + \left[K_d (1 - t) \left(\frac{D}{V} \right) \right] + \left[K_p \left(\frac{P}{V} \right) \right]\,,\qquad (2)$$

where:
K_e are costs of equity,
E is market value of equity,
V is value,
K_d are costs of debt,
t is marginal tax rate,
D is market value of debt,
K_p are costs of preference shares,
P is market value of preference shares.

Mentioned matters about weighted average cost of capital constitute only some of the significant aspects which are contained in WACC. Its important role led to supposition about the indication as the most influential agent in the equation. Thus, this paper assumes the WACC has a crucial impact on the company value development. The postulate applies to the discounted cash flow model. Theoretical suggestions stimulated the investigation.

Calculations were made for the purpose of identification the key variable involved in the company value computation. This corresponds to the primary aim of the research. In other words the goal was to determine the weightiest factor of the discounted cash flow method affecting development of the company value. The subordinate objective was to find out the impact of change associated with each of the elements in the discounted cash flow approach on the change of the resulting company value development.

Method used for enumeration was sensitivity analysis. As Frey and Patil (2002) stated the sensitivity analysis is helpful in detecting the acute spots with control character, organizing preferences regard to the subsidiary eventual studies or acquisition of data, and naturally testing and confirming a formulated model. Respect to the intended objectives of the paper this technique was the most appropriate choice.

Another incentive for inclination to the sensitivity analysis was actuality that it is a greatly often implemented analysis in the company valuation field by researchers. Relevant results have been obtained through various methods for valuation investigation. Findings reached by means of the examination of the discounted cash flow method sensitivity were especially worthwhile.

The validity of company valuation using specifically discounted cash flow approach with sensitivity analysis addition was explored by Steiger (2010). He investigated right discounted cash flow technique building on matter of fact that it is a habitual modern finance's method. Hence, prominence to realize its detailed running principles is notable same as limiting conditions with subsequent aspects.

The merits of closer discounted cash flow method analysis were declared by the very nature of this approach. The point is that prospective information is used. For this reason forecasting is exigency. In principle, numerous prognoses are applied considering individual business as well as overall economic situation. Even slight modifications related to the substantial assumptions lead to capital differences in the value of assessed company. Obviously, it is necessary to identify which preconditions are involved in the calculations. Great importance has also acquaintance of their impact on achieved results. Described impact was analyzed and subjected to sensitivity analysis.

Suitability of the sensitivity analysis using in the company valuation scope, in accordance with examination in this paper, is confirmed over another research that was accomplished by Saputra and Manurung (2014). Discounted cash flow method was implemented. Based on sensitivity analysis, the WACC was studied.

The source of data used for analysis has origin in the paper by Reddy, Agrawal and Nangia (2013). Data were applied in initial calculations of this research and were substituted as inputs. The further calculations were carried out on their basis as well as the following sensitivity analysis. Databases containing financial information, stock exchanges and financial statements served as data sources. Right a highly practical nature of these business statistics led to the choice for desirable data set. A time period for analysis realization in this paper was five years. Selected financial results pertain to manufacturing sector.

The first analysis executed was the descriptive statistics analysis. Table 1 covers the information as mean, median, maximum, minimum, standard deviation, and skewness.

Table 1 Descriptive analysis

	FFCF	WACC	g
Mean	132.53	6.25	0.03
Median	108.40	6.11	0.02
Maximum	214.92	6.68	0.09
Minimum	74.28	5.97	-0.02
Standard Deviation	73.36	0.37	0.05
Skewness	1.32	1.46	0.78

Source: author's calculations

It should be noted that research disposes with restriction. This is in the form of abstracting from non-operating assets even though they are part of the equation (1) which was fundament for discounted cash flow method performance.

Another fact is that consideration needs to be taken in selection of the sector which is decisive for company's business activities, environment, background or economic information. There exist some specifics and divergences among different sectors (see e.g. Labant, 2013; Turisová, 2010) which can subsequently influence data collection, data selection and analysis itself. These various sector specifics should be regarded within achieved results, as well.

4 Findings

The results refer the change in company value caused by changing input factors (Drabiková, 2017). The key input factors were taken into account. Considering that discounted cash flow method was analyzed, the main inputs pertain to this approach. Exactly, these are future free cash flow (FFCF), weighted average cost of capital (WACC) and growth rate in future free cash flow (g). Obtained variations of the company value are reported in Table 2.

Table 2 Percentage changes in company value

	FFCF	WACC	g
-10%	-10.00	20.21	-4.64
-5%	-5.00	9.28	-2.38
0%	0.00	0.00	0.00
5%	5.00	-7.98	2.49
10%	10.00	-14.92	5.12

Source: author's calculations

Reached findings are given in percentages. Such figures expression enables more explicit comprehension of the representations listed below. Range of the interval was defined in which the selected percentage changes covering each principal variable used in the calculation of the resulting company value through the discounted cash flow method are situated. Delimitation is based on the realistic achievement in the factors figures. This holds in particular for WACC and g. Alteration scope is wider for the future free cash flow in practice. Nevertheless, the rates that are in this instance weighted average cost of capital as a discount rate and annual growth rate of future free cash flow acquire standardly values pertaining to the established changes interval. Specifically, interval has a range from -10% to 10%.

To support data transparency, the input factors changes were intended to ±5% and ±10%. However, it is very important to note that every increase or decrease in the value of one factor was conducted under the condition of other factors unchanged. Only in these circumstances there is no results skewing. Only the impact of currently investigated factor is reflected on results of the company valuation. Pay attention to this assumption is crucial both in calculating and in interpreting the results with subsequent drawing conclusions.

Findings stated in Table 2 stand on previous calculations that were realized before the actual finishing enumeration. In the first step the value of the company was quantified. Equation (1) was the authoritative tool for this purpose. Next the conversion of every single input variable was initiated pursuant to presumed changes. Modifications represented an accrual of the input value so as its decrement. Subsequently, company value figuring was performed with regard on each individual change. Admittedly, the change of only one factor was accepted. This was the investigated factor. Other factors remained fixed.

The mathematical determination indicating absolute numbers of the changes in company value with reflection of the percentage changes in variables was comprised in the following step. Order to increase transparency the calculations yielding percentage of changes in value of the company were carried out. Such action later facilitated determination of the impact that the given input factor has on the final company value development. Since the variations of the inputs were expressed as a percentage, variations in company value should be expressed as a percentage, too. Findings are presented in Table 2. There is not only the size of changes in value referred. Also their positive respectively negative development compared to the original state is provided.

To describe reached results, the following Figure 1 and Figure 2 are stated. There are depicted findings (exact company value variations in percentage) corresponding to particular main factors changes. The modifications of major factors at 10%

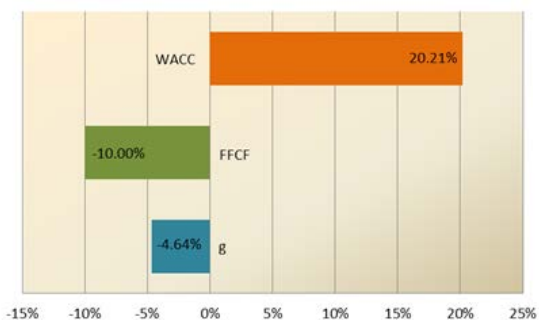decrease and 5% increase were chosen as an instance for illustration.

Figure 1 Alteration in company value development due to change of major factors at 10% decrease
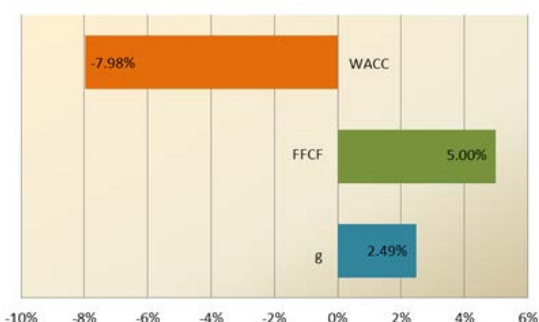Source: author's calculations

Figure 2 Alteration in company value development due to change of major factors at 5% increase
Source: author's calculations

As can be seen, the weighted average cost of capital has an unambiguous leadership in achieving change of the company value in every factors modification case that was chosen for analysis. Another fact is it's exactly the opposite effect on company value movement as the two remaining variables have. If future free cash flow and growth rate in future free cash flow cause a decline in the value of the company based on their given percentage change, the weighted average cost of capital causes a growth and vice versa. The same pattern applies for relation between weighted average cost of capital and variables stated changes. A reduction in the value of this factor triggers the reverse direction of the company value development. Looking at the weighted average cost of capital, last but not least, percentage alteration in factor value is always smaller than percentage alteration in company value.

Examination proves that the second most influential variable emerging within the discounted cash flow method for company valuation is future free cash flow. The specificity is company value increment/decrement sameness as the factor modification level what has been demonstrated collating with other factors in all exhibited figures above. The direction of future free cash flow change and company value change is the same, as well. There exists thus difference with respect to weighted average cost of capital in every point.

The smallest influence on the change in company value development from tested variables has growth rate in future free cash flow. Therefore, the last bar belongs to this variable in each and every tornado graphs view. Achieved figure signifying change of the company value is consistently minor than figure testifying about factor change. Calculations supported by depiction also indicate identical conversion direction considering growth rate and company value. If the change of growth rate in future free cash flow entails its increasing, there is an increase in the value of the company as well as factor value diminishing

heads to the drop of the company value. Comparison with previously analyzed factors shows some common characteristics either with weighted average cost of capital or future free cash flow. Reflecting on weighted average cost of capital, the joint feature is disproportional relation between variable and company value change. The similarity with future free cash flow can be found in the same direction of variable value and company value movement after particular change realization.

The effects of changing the individual factors value by the specified percentage on the company value development are depicted all together in Figure 3. The horizontal axis represents modifications of factors and vertical axis represents consecutive modifications of company value movement.
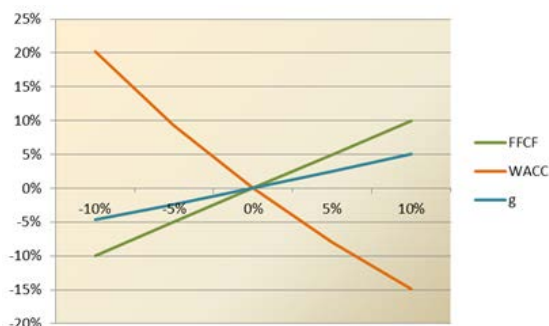

Figure 3 Modified factors indication considering the influence on company value
Source: author's calculations

Looking at Table 2 and Figure 3 where complex findings are reported, Table 2 serves better for the concrete figures review. However, the other supporting information is not so obvious. This concerns curves direction as well as inclination. Such purpose is finer accomplished through transparent visualization in Figure 3.

Figure 3 outlines existing proportionality between value of the company and selected factor. By analyzing relation of the future free cash flow and company value, there is a direct proportionality. This matches with the instance of growth rate, too. Contrariwise, the indirect proportionality can be found between company value and weighted average cost of capital.

The previous fact binds to curves direction. Next additional information that Figure 3 offers is curves inclination. The steepest slope of the curve is noticed at the weighted average cost of capital. Another in sequence is the future free cash flow. The curve reflecting the slightest slope belongs to the growth rate in future free cash flow. In matter of fact, curve inclination indicates the importance degree of the variable represented by the given curve. The biggest influence on the change of company value development has thus factor with the steepest curve slope. Undoubtedly it is the weighted average cost of capital. Based on this criterion, the second most significant variable is future free cash flow. The smallest significance shows growth rate.

5 Conclusion

The topic of valuing the companies or their parts shows a dynamically developing growing trend. This concerns both the private sector and the public sector. In the practice, there exist various methods for company valuation. The paper dealt with discounted cash flow method.

The primary aim of the research was determination the key variable involved in the company value calculation using stated discounted cash flow approach. The subordinate objective was to identify the impact of change associated with each of the agents in the selected approach on the change of the resulting company value development. Method used for computation and fulfillment of defined objectives was sensitivity analysis.

Relevance in connection with choice of the tested approach, utilized method for this purpose as well as data sources rely on already realized research and empirical studies. The fundamental supposition was that weighted average cost of capital has a principled impact on the company value development.

Results of the analysis were reached through changing input factors values that caused change in company value. The whole testing was subordinated to the condition that every increase or decrease in the value of one variable was conducted under the condition of other variables unchanged. The main discounted cash flow method´s factors were considered. These were future free cash flow, weighted average cost of capital and growth rate in future free cash flow.

Examination confirmed the initial assumption. The weightiest factor of the discounted cash flow approach affecting development of the company value was weighted average cost of capital. The primary goal was thus accomplished. What is more, this variable had exactly the opposite effect on company value movement as two remaining variables. Discussing relation between company value and particular factor value, a direct proportionality exists in the growth rate case as well as future free cash flow case. An indirect proportionality can be found in the weighted average cost of capital instance. Another finding is that percentage alteration in weighted average cost of capital value was always smaller than percentage alteration in company value.

Research further proved that the second most influential variable emerging within the discounted cash flow method for company valuation is future free cash flow. Uniqueness lay on, in compare with other studied components, figures uniformity of the company value modification grade and factor modification grade. The degree of individual factor importance is explained not only by the calculations but also by the slope of the curve representing this factor what is summarily depicted in Figure 3. Therefore, the most eminent influence on the company value development conversion has factor with the steepest curve slope. The weighted average cost of capital took the first place, then was the future free cash flow and the last one the growth rate. This order is identical to the results of the calculations.

Looking at findings consequent from various authors work, they are similar to the findings in this paper. In general it can be stated that the weighted average cost of capital has leadership in achieving change of the company value when considering application of the discounted cash flow method as principle for valuation. For that reason, the focus should be on paying more attention to its calculations, related previous analyzes and input data, as well. Even the slight inaccuracy, incompleteness or simplification can cause a quite capital differences in the final value of assessed company.

Although mentioned factor appeared as the most influential in majority studies dealing with this topic, there emerged some exceptions. Such a knowing opens the question why is that so. Further research is instigated also by potential benefit resulting from deeper analysis of components included in the weighted average cost of capital itself (see equation 2). Take a closer look on these individual variables through application on data of the picked company / companies could bring some interesting insights. Another possibility for next investigation is testing and consequential comparing with results for different sectors.

Literature:

1. Asquith, P., Mikhail, M. B., Au, A. S. (2005). Information Content of Equity Analyst Reports. *Journal of Financial Economics*, 75(2), 245-282.
2. Chaplinsky, S. (2000). Methods of Valuation for Mergers and Acquisitions. Working Paper UVA-F-1274.
3. Cornell, B. (2013). Discounted Cash Flow and Residual Earnings Valuation: a Comparison in the Context of Valuation Disputes. *Business Valuation Review*, 31-32(4, 1-3), 157-164.
4. Defond, M. L., Hung, M. (2003). An Empirical Analysis of Analysts' Cash Flow Forecasts. *Journal of Accounting and Economics*, 35(1), 73-100.
5. Demirakos, E. G., Strong, N. C., Walker, M. (2004). What Valuation Models Do Analysts Use? *Accounting Horizons*, 18(4), 221-240.
6. Drabiková, E. (2017). Examination of the Company Valuation Pertaining to Manufacturing Sector Using the Selected Method. In: *International Masaryk Conference - MMK 2017*, Hradec Králové.
7. Ernst & Young (2014). Valuation and Business Modeling. Ernst & Young.
8. Fernández, P. (2015). Company Valuation Methods. SSRN Working Paper No. 274973.
9. French, N. (2013). The Discounted Cash Flow Model for Property Valuations: Quarterly Cash Flows. *Journal of Property Investment & Finance*, 31(2), 208-212.
10. French, N., Gabrielli, L. (2005). Discounted Cash Flow: Accounting for Uncertainty. *Journal of Property Investment & Finance*, 23(1), 75-89.
11. Frey, H. C., Patil, S. R. (2002). Identification and Review of Sensitivity Analysis Methods. *Risk Analysis*, 22(3), 553-578.
12. Gilbertson, B., Preston, D. (2005). A Vision for Valuation. *Journal of Property Investment & Finance*, 23(2), 123-140.
13. Imam, S., Barker, R., Clubb, C. (2008). The Use of Valuation Models by UK Investment Analysts. *European Accounting Review*, 17(3), 503-535.
14. Imam, S., Chan, J., Shah, S. Z. A. (2013). Equity Valuation Models and Target Price Accuracy in Europe: Evidence from Equity Reports. *International Review of Financial Analysis*, 28, 9-19.
15. Kazlauskienė, V., Christauskas, Č. (2008). Business Valuation Model Based on the Analysis of Business Value Drivers. *Engineering Economics*, 57(2), 23-31.
16. Labant, S. (2013). *Deformation Analysis of Stability Area*. Miskolc: Bibor Publisher.
17. Laswad, F., Baskerville, R. F. (2007). An Analysis of the Value of Cash Flow Statements of New Zealand Pension Schemes. *British Accounting Review*, 39(4), 347-355.
18. Lee, C. M. C. (2003). Choosing the Right Valuation Approach. In: *AIMR Conference Proceedings Issue*, Amsterdam.
19. Lundholm, R., O'Keefe, T. (2001). Reconciling Value Estimates from the Discounted Cash Flow Model and the Residual Income Model. *Contemporary Accounting Research*, 18(2), 311-335.
20. Neifeld, R. A. (2001). Macro-Economic Model Providing Patent Valuation and Patent Based Company Financial Indicators. *J. Pat. & Trademark Off. Soc'y*, 83, 211-896.
21. PriceWaterhouseCoopers (2015). Valuations. Price Waterhouse Coopers.
22. Reddy, K. S., Agrawal, R., Nangia, V. K. (2013). Reengineering, Crafting and Comparing Business Valuation Models: the Advisory Exemplar. *International Journal of Commerce and Management*, 23(3), 216-241.
23. Saputra, D., Manurung, A. H. (2014). Valuation of PT. ASTRA AGRO LESTARI Share Price Using Discounted Cash Flow Method. *Journal of Capital Market and Banking*, 2(2), 12-39.
24. Sharma, D., Iselin, E. R. (2003). The Decision Usefulness of Reported Cash Flow and Accrual Information in a Behavioural Field Experiment. *Accounting and Business Research*, 33(2), 123-135.
25. Steiger, F. (2010). The Validity of Company Valuation Using Discounted Cash Flow Methods. Seminar Paper arXiv: 1003.4881.
26. Turisová, R. (2010). Evaluation of Benefits from their Relationship with Customer. *Acta Oeconomica Cassoviensia*, 3(2), 96-100.

Primary Paper Section: A

Secondary Paper Section: AH