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INVESTMENT EVALUATION AND BUSINESS PERFORMANCE OF MANUFACTURE COMPANIES IN SLOVAKIA

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ABSTRACT

The paper is focused on area of investment measurement and management in manufacturing enterprises in Slovakia and especially analyses wood processing industry. The aim of this study was to investigate using of certain methods and groups of indicators in investment effectiveness valuation and their possible impact in better business performance. Discounted cash flow valuation is one of several ways of approaching valuation, however, it is a foundation of all other valuation approaches, so we are mainly interested in indicators such as Net Present Value or Internal Rate of Return. We used in the research two-dimensional inductive statistics between categorical variables, the dependence we examined with contingency and we also applied analysis of variance. Our research statistically confirmed that better business performance is significantly dependent on use of certain investment effectiveness valuation methods.

KEYWORDS: Business performance, manufacture enterprises, wood processing industry, investment, investment evaluation methods, discounted cash flow indicators.

INTRODUCTION

Investment decision-making is one of fundamental parts in business performance management. However, to meet the strategic goals, a company needs to apply successful methods for management and measurement of business performance. Allocation of available financial resources to fixed assets or investments in modernization of production technologies are possible ways when a company can ensure its prosperity.

Investment opportunities exist in industry – companies with sophisticated production in Slovakia may benefit from low labor costs more than offers the business in the EU area. Slovakia also has a well-established cluster of companies in the automotive industry, the country is slowly

increasing production and attracting for more manufacturers. Slovakia has recently become a leading global manufacturer of cars per capita. Latest technology and skills exist in Slovakia. Opportunities are also in the information technologies market. Slovakia provides an excellent environment for outsourcing or service centers: Dell and Swiss are an example. Both initially placed only a small part of its business activities in Slovakia. Although they reduced their organizations recently, the crisis has spread its presence in Slovakia. Slovakia has adequate sources of wood, but significant share is exported as a raw material. Companies should benefit from the added value of the goods at home and they should effective export finished products. Drinking water and mineral springs are also rich sources for Slovakia. Businesses in the food and beverage industry, wellness tourism sector should reap the benefits of 1200 mineral springs in the country.

Focusing on the wood processing industry (WPI), Slovakia currently exports raw wood in large. Significant competitive advantages for the WPI are wood stock as renewable raw materials and wood harvesting forecast. The wood stock in Slovak forests has been increasing continuously. Wood harvesting is also growing. The increase of harvest increases also the economic potential of Slovak forests (SARIO). Taking into account the current age structure of forests in Slovakia in term of next 40-50 years, harvest possibilities will be better than in present time. The planned volume of total harvesting will therefore gradually increase to expected peak in the years 2040-2050. In case of foreign capital, which will be invested in new technologies for processing of domestic raw materials, potential effects from foreign direct investment especially reflect in a higher value added in the WPI, in the growth of the WPI share in the GDP of Slovakia.

Wood industry in Slovakia has not dominant status of automobile production, does not be put to the environmental discussion as a power sector, there is missing the advertising campaign which have chemical products and according to some opinions, wood sector does not require strategic solutions, in contrast with engineering for example. However, woodworking and furniture industry in Slovakia exists and it is more than necessary. Forests and sophistically used wood constantly produced by forests are the base for development of WPI, which may be strategic for the Slovak economy. Increased consumption of wood in the Slovak Republic and focusing on domestic production can be the best help for companies to find solutions in a difficult situation to which they now face. But just because current situation, there is increasing potential for any effects.

In evaluation of investment we evaluate their suitability, efficiency and feasibility of the particular project. Moreover we evaluate the impact of the project in total effectiveness, prosperity and financial stability of the company (Polách et al. 2012, Rajnoha et al. 2014 and others). Use of successful investment evaluation methods should affect the performance of company and this investigation is the goal of presented paper.

Theoretical background - investment effectiveness evaluation methods

In theory and in practice (Levy and Sarnat 1986, Brealey and Myers 2003, Drábek and Polách 2008, and others) is said that it is harder to calculate estimated money income out of investment then certain capital expenses. Some capital expenses in a form of machines, appliances, etc. can be calculated easily. Therefore, calculation of estimated money income is taken as critical, as a main point in a process of capital planning and investment decision making.

Based on the theoretical sources (Levy and Sarnat 1986, Ward et al. 1996, Renkema and Berghout 1997, Brealey and Myers 2003, Baum and Hartzell 2012, Damodaran 2012, and others) can be commonly used investment evaluation methods briefly summarized below.

Evaluation methods based on annual indicators are useful for short-term evaluation of project effectiveness. Countries with developed market economy don't use those methods as relevant because they don't use the so called time factor into consideration.

Discounted methods for investment evaluation remove faults of annual valuation methods. In the process of quantification of chosen criteria they take time factor into consideration. In economic life time factor makes things more serious, it enables the change of money evaluation. If that change was taken wrongly, it would be possible to make a wrong decision which would have significant influence on project effectiveness, enterprise stability.

Additional methods could increase the investment decision making process quality.

Beside previously mentioned methods (mostly used in theory and practice) can be applied modern methods based on investment controlling.

While discounted cash flow valuation is one of the three ways of approaching valuation, it is the foundation on which all other valuation approaches are built (Damodaran 2012). Suggested financial-mathematical methods of discounted character consider time changes of money values, and they take two basic rules of financing into consideration (Brealey and Myers 1999):

1. Value of one money unit today is bigger than the value of one money unit tomorrow, because today's money unit can be invested and it could earn on interest. It means that income to come in future has lass value for us. Therefore, it is necessary to calculate estimated income with current (today) value (CVCF), i.e. on the same time basis we usually observe time from introducing the project to realisation. Only on the base of CVCF it is possible to estimate project effectiveness correctly and to make the right decision about its realisation.
2. Safe money unit has greater value then risky money unit. Most investor go away from the risk, totally if possible, so they sacrifice some profit because of it. During the realisation of investment projects it is impossible to avoid the risk. That risk is necessary to identify properly, evaluate it, and estimate its influence on enterprise economical results and to find the way to decrease the entrepreneurial risk (market, economic, social, working, etc.).

Each company usually sets its own methods, criteria, which are the most acceptable and which enable right investment decision making, according to their own point of view considering investment effectiveness and suitability.

MATERIAL AND METHODS

Methods

We focus on complex area of investment measurement and management in the research and in this part we investigated the investment effectiveness evaluating. We categorized groups of valuation methods and certain indicators for each group and then we aimed at the most common group of methods.

The research objective was to analyze relationships between the use of investment evaluation methods based on discounted cash-flow and performance given by the indicator Return on Equity (ROE). To goal was to find out statistically relevant determinants with the impact in better performance of companies. On the base of questionnaire we analyzed obtained results.

Selected results of the research presented in this work content analyses:

- Obtained business performance
- Use of investment effectiveness evaluation methods
- Use of methods based on discounted cash-flow and their relationship with the business performance.

Several hypotheses have been established in the complex research, within this publication of selected part we focused and tested the one, we formulate the null hypothesis H0 and alternative H1:

H_0: The use of methods based on discounted cash flow does not affect the performance of enterprises in terms of the ROE indicator.

H_1: Using methods based on discounted cash flow affects the business performance. We assume these methods are applied in enterprises that achieve average or higher ROE. If companies do not use tested methods, we will statistically prove that they are not powerful.

What is the current situation and trends in use of investment effectiveness measurement in Slovakia, dominantly in the research sample of manufacturing companies, we presented in our work.

Methodologically, there was created on-line questionnaire through internet application to build data collection of companies in Slovakia (more in Questionnaire Survey or Rajnoha et al. 2013). We maintain complete anonymity of participating firms. The size of research sample was 164 counts. In complex research we analyzed all companies, we created samples according certain industries (engineering, automotive, wood processing etc.). Part of research presented in this paper has mainly focused on manufacturing enterprises (core of business was production) and in realization to them especially analyses companies in wood processing industry. Tab. 1 presents sizes of research samples. Statistical classification of Economic activities (NACE Rev. 2) in the Statistical Office of the Slovak Republic defines within the wood processing industry:

- Manufacture of wood (Wood industry – WI)
- Manufacture of pulp and paper products (Pulp and paper industry – PPI)
- Manufacture of furniture (Furniture industry – FI).

Tab. 1: Basic information about research samples.

Research sample	Industry	Sample size
All companies	All tested industries and branches	164 companies
Manufacture companies	Core of business was production	106 companies
Wood processing companies	Included: WI, FI, PPI	34 companies

Companies were initially analyzed according the distribution of the achieved performance of the 6 particular groups (Groups 0-5, group 0 – the worst performance with negative ROE, Group 5 - the highest performance with the ROE over 10%).

We have used mathematical and statistical methods in the research of interdependencies and impacts of individual factors on achieved performance of companies.

One-dimensional inductive statistics

In research, we analyzed selected descriptive statistics for one variable – absolute and relative frequencies, cumulative frequency and cumulative relative frequency, mean, median and mode. Statistical methods were used: frequency tables showing the frequency by categories, histograms, pie charts, bar and cumulative bar charts, time series and trends.

Two-dimensional inductive statistics between categorical variables

The research consisted from qualitative – nominal variables, their relationship cannot adequately describes the correlation analysis, so the association between variables we examined with contingency (Pearson 1904, Everitt 1977, Pánik 2005 and others). We applied chi-squared test, which is commonly used for testing the independence between two categorical variables. Results of chi-squared tests describe selected statistics: Pearson's chi-square and significance p-value „p", Maximum-Likelihood chi-square and p-value, Pearson's contingency coefficient (CC), Adjusted contingency coefficient (Adj. CC) and degrees of freedom (df).

Pearson's Chi-square: $\chi^2 = \sum_{i=1}^{k} \left[\left(f_{o_i} - f_{e_i} \right)^2 / f_{e_i} \right]$; while $\sum (f_o - f_e) = 0$ (1)

Pearson's contingency coefficient CC: $CC = \sqrt{\chi^2 / (\chi^2 + N)}$ (2)

Maximum contingency coefficient CCmax: $\mathrm{CCmax} = \sqrt{(q-1)/q}$ (3)

Adjusted contingency coeff. Adj. CC: Adj.CC=CC/CCmax; while CC≤CCmax (4)

Where: f_{oi} – observed frequency in an field of the table,
f_{ei} – expected (theoretical) frequency in an field of the table,
k – number of cells in the table
N – sample size
q – number of rows or columns (in square tables)

We also applied analysis of variance (ANOVA) in the research. The purpose of ANOVA (Shapiro and Wilk 1965, Iversen and Norpoth 1976 and others) is to test differences in means (for groups or variables) for statistical significance. For testing of homogeneity of variances as one assumption of ANOVA we used Levene´s test (Levene 1960).

For statistical analysis, numeric and graphical presentation of the research results, we used the program MS Office Excel and Statistic software from StatSoft, Inc.

RESULTS

Business performance

For basic sorting parameter Business performance (ROE indicator), we analyzed descriptive statistics of one variable. Achievements in tested research samples are presented in Tabs 2 and 3.

Tab. 2: Descriptive statistics: Business performance (Groups of ROE indicator).

Research sample	Counts	Mean	Median	Mode	Counts (mode)
All tested companies	164	2.06	2	1	47
Manufacture	106	2.02	2	1	32
Wood processing companies	34	1.65	1	1	11
Wood industry	21	1.90	1	1	8
Furniture industry	11	1.27	1	2	4
Pulp and paper industry	2	1.00	1	multiple	1

Tab. 3: Observed frequencies: Business performance (Groups of ROE indicator).

Group (ROE indicator)	Group 0 (negative ROE)	Group 1 (0-2 %)	Group 2 (2-4 %)	Group 3 (4-7 %)	Group 4 (7-10 %)	Group 5 (over 10 %)	Total
Sample of all companies							
counts	25	47	35	26	12	19	164
cumulative	25	72	107	133	145	164	-
relative counts	15.24%	28.66%	21.34%	15.85%	7.32%	11.59%	100.00%
cumulative	15.24%	43.90%	65.24%	81.10%	88.41%	100.00%	-
Sample of Wood processing companies							
counts	8	11	8	3	0	4	34
cumulative	8	19	27	30	30	34	-
relative counts	23.53%	32.35%	23.53%	8.82%	0.00%	11.76%	100.00%
cumulative	23.53%	55.88%	79.41%	88.24%	88.24%	100.00%	-

From the descriptive statistics of variable business performance (categorized according the ROE indicator into 6 groups) in the sample of all companies shows the mean 2.06, companies in average create positive, but relatively low Return on Equity in the range of 2-4% in Slovakia. Median is at level 2. Modus, the maximum frequency is represented in the second group with a performance at the level of 0-2% ROE, which includes 29% of the total sample of enterprises.

By comparison, **in the sectors of the WPI** are larger frequencies of lower performance in groups 0, 1, 2 and 3, the median in comparison with the sample of all enterprises have been reduced to a negative one, which means that up to half of the WPI enterprises has a negative or very low positive ROE. The results of descriptive statistics thus represent **the lowest performance** of all surveyed industries.

Using of investment evaluation methods

In analysis of investment effectiveness evaluation methods companies could choose any number of responses and identify one or more methods or group of methods. As we defined in theoretical part, we focused on four groups of methods for investment evaluation.

Performance of companies can certainly not be associated with a number of methods or evaluation groups that are used in the evaluation. For example, an enterprise which uses two groups of methods - annual and additional methods may not be successful and powerful than company using only one group, for example. Discounted cash-flow methods, which take into account the time factor when considering a long-term capital are significant. In order to categorize businesses by relevance of using of certain combinations of methods, enterprises were divided into four categories (Fig. 1):

- **Without evaluation:** Companies indicated that they are not engaged in evaluating of investment efficiency and do not use assessment methods.
- **Annual evaluation:** Enterprises are characterized by using only annual or complementary methods, but they do not use discounted methods appropriate for longer period than one year or controlling methods of assessing the effectiveness of investments.
- **Discounted cash-flow indicators:** Businesses are characterized by the fact that they use discounted cash-flow indicators or some other but in terms of importance for investments less important methods. Surely they do not use controlling methods.
- **Controlling evaluation:** Enterprises are characterized by exploiting the discounted and controlling methods of assessing the effectiveness of the investment.

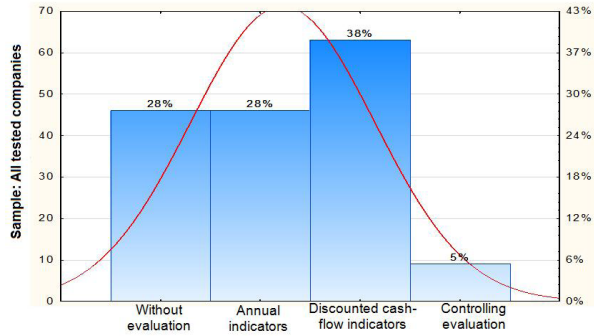

Fig. 1: Focusing on investment effectiveness evaluation – crucial methods (Source authors).

Tab. 4: Observed frequencies: Investment effectiveness valuation methods.

Investment effectiveness evaluation – crucial methods	Without valuation	Annual indicators	Discounted cash-flow indicators	Controlling valuation	Total
Sample of all companies					
counts	46	46	63	9	164
cumulative	46	92	155	164	-
relative counts	28.05%	28.05%	38.41%	5.49%	100.00%
cumulative	28.05%	56.10%	94.51%	100.00%	-
Sample of wood processing companies					
counts	12	9	12	1	34
cumulative	12	21	33	34	-
relative counts	35.29%	26.47%	35.29%	2.94%	100.00%
cumulative	35.29%	61.76%	97.06%	100.00%	-

When we analyzed each group of evaluation methods separately, the most common were annual indicators (108 companies). But when we specify what the basic focus and crucial evaluation is, presented in Tab. 4, frequency and use of annual methods was reduced to 46 companies and the greatest number of enterprises (63 enterprises, 38.41%) has focused on discounted cash-flow assessment methods.

In wood processing industry, the situation in the use of investments evaluation methods is worse compared with the research sample of manufacturing enterprises. As evidenced from the relative counts, in the WPI is higher proportion of businesses that do not benefit from any valuation (28% in manufacture compared with 35% in the WPI). And further, the use of whatever method is lower in WPI, controlling evaluation uses only one wood processing company. The current situation of the WPI can therefore be viewed as negative.

Discounted cash-flow methods and impact into business performance

This part of research was focused on the analysis of the use and impact of discounted cash-flow evaluation methods of investment projects, while businesses could choose to answer consisting of four methods, their combinations and option that they do not use this kind of investments assessment. The issue was further investigated statistically as a binary variable for

each method, to determine whether the use of certain method affects the performance of the company. We analyzed the following discounted cash flow methods of investment evaluation:

- Net Present Value (NPV)
- Profitability Index (PI)
- Internal Rate of Return (IRR)
- Payback Period (PP).

Performance of companies in this analysis was categorized into three performance groups according the ROE indicator (the questionnaire originally contained six performance groups, but because of low frequencies we connected them and created only tree groups). In the research have been demonstrated statistically significant relationships for certain methods characterized below. On the other hand, general purpose of discounted cash-flow methods without specifying the concrete method, has no statistically significant effect on the business performance.

In all tested enterprises, a statistically significant relationship is between performance and two indicators: **Profitability Index** and **Internal Rate of Return** (Tabs. 5 and 7). Both pursued relationships show moderate dependence with similar Adj. CC at 0.26 (and 0.25 respectively). The data presented residuals (Tabs. 6 and 8) show that if companies do not use specified evaluation method, they obtain poor performance with negative or very low positive ROE to 2%. When they use the mentioned methods, the differences between observed and expected frequencies are significant for the second and third group of performance (positive ROE above 2%), residuals are slightly higher for the second group (ROE 2-7%). So, we cannot say, that with application of these methods companies have extremely high performance; probability to result with the ROE indicator at the level of 2% or 10% is the same. But it is sure that without analyzed methods companies are very weak with the ROE under 2%.

Tab. 5: Contingency: All tested companies; PI Method vs. Performance – statistics.

Statistics	x^2	Df	p
Pearson´s x^2	6.470499	Df=2	p=0.03935
M-l x^2	6.795803	Df=2	p=0.03344
Contingency coefficient (CC)	0.1948248		
Cramér. *V*- coefficient	0.1986310		
Adjusted CC	0.25581		

Tab. 6: Contingency: All tested companies; PI Method vs. Performance – frequencies.

Profitability index- PI	Group 1 Low performance (ROE<0, 0-2%)	Group 2 Middle performance (ROE 2-4%, 4-7%)	Group 3 High performance (ROE 7-10%, >10%)	Row totals
Observed frequencies				
Without use of the method	66	48	23	137
Use of the method	6	13	8	27
Totals	72	61	31	164
Expected frequencies				
Without use of the method	60.14634	50.95732	25.89634	137.0000
Use of the method	11.85366	10.04268	5.10366	27.0000
Totals	72.00000	61.00000	31.00000	164.0000
Residual frequencies				
Without use of the method	5.85366	-2.95732	-2.89634	0.00
Use of the method	-5.85366	2.95732	2.89634	0.00

Tab .7: Contingency: All tested companies; IRR Method vs. Performance – statistics.

Statistics	x^2	Df	p
Pearson´s x^2	6.349167	Df=2	p=0.04181
M-l x^2	7.171801	Df=2	p=0.02771
Contingency coefficient (CC)	0.1930583		
Cramér. V- coefficient	0.1967598		
Adjusted CC	0.25345		

Tab. 8: Contingency: All tested companies; Method IRR vs. Performance – frequencies.

Internal rate of return – IRR	Group 1 Low performance (ROE<0, 0-2%)	Group 2 Middle performance (ROE 2-4%, 4-7%)	Group 3 High performance (ROE 7-10%, >10%)	Row totals
Observed frequencies				
Without use of the method	70	52	27	149
Use of the method	2	9	4	15
Totals	72	61	31	164
Expected frequencies				
Without use of the method	65.41463	55.42073	28.16463	149.0000
Use of the method	6.58537	5.57927	2.83537	15.0000
Totals	72.00000	61.00000	31.00000	164.0000
Residual frequencies				
Without use of the method	4.58537	-3.42073	-1.16463	0.00
Use of the method	-4.58537	3.42073	1.16463	0.00
Totals	0.00000	0.00000	0.00000	0.00

In the **research sample of manufacturing companies** was statistically demonstrated the relationship between performance and in theory often cited method related to the rate of return on invested capital - **Profitability index** (Tab. 9). Dependence strength is medium (Adj. CC 0.31). Residual frequencies (Tab. 10) clearly show that if manufacturing enterprises apply the method, typically obtain outstanding performance with the ROE above 7%. On the other hand, manufacturing enterprises that do not use the method of profitability index, typically achieve the lowest performance with a negative or very low ROE to 2%.

Tab. 9: Contingency: Manufacturing companies; PI Method vs. Performance – statistics.

Statistics	x^2	Df	P
Pearson´s x^2	6.217915	Df=2	P=0.04465
M-l x^2	5.591632	Df=2	P=0.06107
Contingency coefficient (CC)	0.2353918		
Cramér. V- coefficient	0.2421974		
Adjusted CC	0.30860		

Tab. 10: Contingency: Manufacturing companies; PI Method vs. Performance – frequencies.

Profitability index- PI	Group 1 Low performance (ROE<0, 0-2%)	Group 2 Middle performance (ROE 2-4%, 4-7%)	Group 3 High performance (ROE 7-10%, >10%)	Row totals
Observed frequencies				
Without use of the method	44	31	13	88
Use of the method	5	6	7	18
Totals	49	37	20	106
Expected frequencies				
Without use of the method	40.67925	30.71698	16.60377	88.0000
Use of the method	8.32075	6.28302	3.39623	18.0000
Totals	49.00000	37.00000	20.00000	106.0000
Residual frequencies				
Without use of the method	3.32075	0.283019	-3.60377	0.00
Use of the method	-3.32075	-0.283019	3.60377	0.00
Totals	0.00000	0.000000	0.00000	0.00

Analysis of relationship of the individual discounted cash flow methods and business performance differentiated originally to the 6 groups also showed the p-value $p<0.05$ in the sample of manufacturing companies. Due to the unfulfilled assumptions of expected frequencies was not appropriate to interpret the values of contingency coefficients or residual frequencies in contingency tables. However, the results of the p-value have led us to the decision to examine further the use of discounted cash-flow investment evaluation methods and performance by statistical analysis, which would offer sufficient evidence of a statistically significant dependence of variables. We used analysis of variance. Statistical characteristics of the use of four indicators based on discounted cash flow presents Tab. 11, two of them, where was demonstrated the impact on performance, we display in Figs 2 and 3.

Tab. 11: Analysis of variance in manufacturing companies: Using of individual discounted cash-flow methods vs. Performance.

Levene´s test of homogeneity of variances								
Performance (roe)	Ss - effect	Df - effect	Ms- effect	Ss - error	Df - error	Ms- error	F	p
Net present value	1.0852	1	1.0852	86.198	104	0.8288	1.3093	0.255
Profitability index	0.3373	1	0.3373	79.502	104	0.7644	0.4413	0.507
Internal rate of return	0.1547	1	0.1547	88.265	104	0.8487	0.1822	0.670
Payback period	0.1452	1	0.1452	81.497	104	0.7836	0.1853	0.667
Analysis of variance (ANOVA)								
Performance (roe)	Ss - effect	Df - effect	Ms- effect	Ss - error	Df - error	Ms- error	F	p
Net present value	0.4474	1	0.4474	259.51	104	2.4953	0.1793	0.6728
Profitability index	10.726	1	10.726	249.23	104	2.3965	4.4757	0.0367
Internal rate of return	9.4674	1	9.4674	250.49	104	2.4086	3.9306	0.0500
Payback period	1.9765	1	1.9765	257.98	104	2.4806	0.7968	0.3741

Statistics: net present value (NPV)					
Using the method	Performance (roe) - mean	Confidence int. -95.000%	Confidence int. +95.000%	Performance (roe) - n	Performance (roe) – st.dev.
No	1.988506	1.645316	2.331696	87	1.610245
Yes	2.157895	1.471301	2.844488	19	1.424514
All categories	2.018868	1.715835	2.321901	106	1.573477
Statistics: profitability index (PI)					
Using the method	Performance (roe) - mean	Confidence int. -95.000%	Confidence int. +95.000%	Performance (roe) - n	Performance (roe) – st.dev.
No	1.875000	1.549262	2.200738	88	1.537370
Yes	2.722222	1.925728	3.518716	18	1.601674
All categories	2.018868	1.715835	2.321901	106	1.573477
Statistics: internal rate of return (IRR)					
Using the method	Performance (roe) - mean	Confidence int. -95.000%	Confidence int. +95.000%	Performance (roe) - n	Performance (roe) – st.dev.
No	1.927835	1.615539	2.240131	97	1.549512
Yes	3.000000	1.784629	4.215371	9	1.581139
All categories	2.018868	1.715835	2.321901	106	1.573477
Statistics: payback period (PP)					
Using the method	Performance (roe) - mean	Confidence int. -95.000%	Confidence int. +95.000a%	Performance (roe) - n	Performance (roe) – st.dev.
No	1.935065	1.573673	2.296457	77	1.592232
Yes	2.241379	1.660442	2.822317	29	1.527256
All categories	2.018868	1.715835	2.321901	106	1.573477

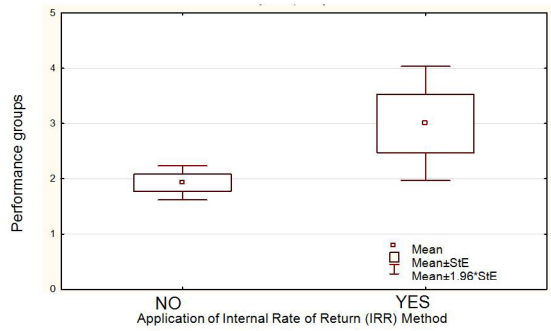

Fig. 2: Manufacturing companies: Use of internal rate of return (IRR) vs. performance (Source authors).

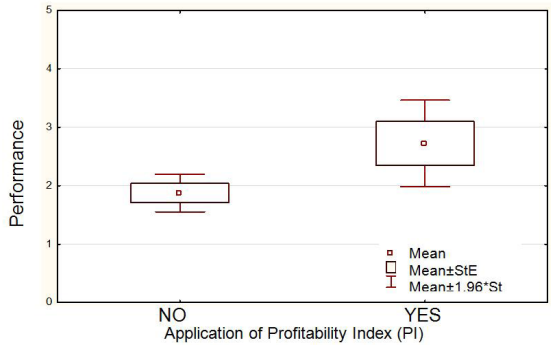

Fig. 3: Manufacturing companies: Use of profitability index (PI) vs. performance. (Source authors).

Tab. 11 documents the relationship between individual methods and performance differentiated originally to six groups (0 - the lowest performance, 5 - the highest performance) in the sample of manufacturing enterprises. Levene´s test determined the p-value p> 0.05 for all methods, whereby we did not reject the null hypothesis of equal variances; assumption for ANOVA test was fulfilled. In the ANOVA test, p-value was p<0.05 and thus statistically significant dependence of proven performance in relation to methods Profitability index and Internal rate of return. Moreover, using the method of IRR can be reported higher average performance than when applying the method of IR. Based on the results of applying statistical analyses, despite slight differences in means, use of both investment evaluation methods we consider as significant factors affecting the performance of manufacturing enterprises.

DISCUSSION

The most frequent method in business management is financial analysis and financial indicators (Sujová et al. 2014). However, only complex evaluation can assure fulfillment of entrepreneurial goals – increase of production abilities, cost decrease, ennobling of invested capital, and increase of the enterprise market value. Investment basis must be evaluated equally well (Drábek and Jelačić 2007). According Sujová and Marcineková (2015), successful economic development require besides the application of traditional methods also the application of new modern methods based on traditional systems of financial indicators and are completed by time and qualitative indicators.

Based on our research results, focusing on methods for evaluating the effectiveness of investments, we have made the decision on the hypothesis formulated at the beginning of the study: We reject null hypothesis H0 and conclude the alternate hypothesis H1 is true. Dependence of business performance on using of discounted cash-flow methods was statistically proven in the sample of all tested enterprises as well as in the sample of manufacturing enterprises. Performance of enterprises in the first mentioned sample using specific methods - Profitability Index and Internal Rate of Return, achieves medium (ROE 2-7%) and higher (ROE above 7%) performance level. On the other hand, we demonstrated, if companies do not use tested methods, they reach low performance with negative ROE or to 2% ROE. The result in sample of manufacturing companies is more important compared with sample of all tested companies, because in the second sample we can say that using of tested method the Profitability Index leads to the ROE above 7% (in contrast with more than 2% ROE in the first sample).

In wood processing industry of Slovakia is clear negative situation as reveals analysis of investment evaluation methods application. Up to 35% of WPI businesses does not use any method that could be applied in investment decision-making. Although there was not demonstrated a statistically significant impact of the use of investment methods in business performance of WPI, based on analyzes of the research sample of manufacturing companies, we consider this is a possible problem in the WPI with an impact in worse performance. Without investment cannot fully meet particularly economic objectives of the business (Merková et al. 2011). There is a review by the perception of prices, while investors will not certainly decide for the lowest current price - as low production costs and cheap labor or low tax cost - but primarily on the lowest cost throughout the life cycle of the investment (Merková et al. 2012). Hajdúchová et al. (2016) suggest that wood-processing industry should strive to increase its competitiveness by implementing modern management methods, using new technologies, or concentrating production in a larger scale. There is also a need for optimal solutions that reflect the principles of sustainable development.

Theory (e.g. Polách et al. 2012, Rajnoha et al. 2013) consider the important also controlling methods, but in our research their use did not reach required frequencies in enterprises in Slovakia and therefore it was not appropriate to interpret the results of statistical analysis.

CONCLUSIONS

1. We demonstrated that using of discounted cash-flow method – Profitability Index leads to the better business performance, what means the ROE above 7% in sample of manufacturing companies.
2. If companies do not use discounted cash-flow methods, they reach low performance with negative ROE or to 2% ROE.
3. Use of controlling methods, the ANOVA test was detected p-value <0.05 and thus statistically significant affect in better business performance.
4. According the fact that we demonstrated statistically significant relationship between investment effectiveness evaluation and business performance, we conclude the use of certain methods of investment evaluating is necessary for development, competitiveness and better performance of wood-processing companies.
5. In area of business investment measurement and management the financial and economic evaluation of investment we consider as crucial factor of success in all companies.

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