ORIGINAL PAPER

THE ROLE OF IT IN THE LOGISTICS SECTOR: THE IMPACT OF DUPONT MODEL ON THE PROFITABILITY OF IT COMPANIES

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ABSTRACT. **Background:** The information technology (IT) is presented in all levels of the supply chain, from the communication with suppliers, through the manufacture process and until the delivery to clients. Moreover, IT has a positive effect on the performance of the supply chain. In this context, it is important for the IT sector to register a positive evolution, in other words it is important that the IT companies to be profitable and to continue to exist on the market ensuring the provision of the necessary tools for the logistic sector. Therefore, the objective of this paper was to analyze the profitability of the IT companies and to identify which factors impact it. The importance of our study in the context of the logistic sector can be sustained by the fact that technology information constitutes a crucial strategic aspect for the logistics service providers and it is important to maintain a positive evolution of the IT sector.
Methods: There was used a regression analysis which started from the factors of the DuPont model and afterwards supplemented by one factor identified based on the Stepwise method.
Results: The results show that the profitability of the Romanian IT companies is influenced by the Net Profit Margin, the Asset Turnover, the Financial Leverage and the Sales Growth.
Conclusions: More exactly, the profitability of these companies is impacted by the capacity to generate net income based on the sales performed (and indirectly by the management of the costs), the efficiency with which the assets are used in order to generate revenues, the financing source of the assets and by the growth of the sales volume. Our results may present importance for the financial management, investors and researches offering insights about the factors which should be observed in order to improve the profitability of an IT entity from Romania. The importance of this study for the logistics sector can be interpreted as following: knowing which is the evolution of the IT market from a country and which factors impact the profitability of it represents an asset from the point of view of the logistics aspects, as there can be provided insights in case that the continuity for the tools needed is uncertain. Future research direction may imply the analysis of the correlation between the evolution of the IT companies and the logistic sector. Considering the fact that, as far as we know, no similar study was performed at the level of the Romanian IT industry, the novelty and originality of the research is represented by the performance of the research at the level of this market.

Key words: profitability, IT market, Romania, DuPont model, ROE, supply chain.

INTRODUCTION

In the economic world from today, companies are facing with a significant competition and are put in the situation in which they should improve their portfolio of products and services in order to be attractive on the market. In this context, companies are facing with various difficulties in relation to the administration of the information flow throughout the supply chain. As a consequence to this situation, and in order to make the logistic operations easier, entities use the technology information tools. Therefore, the information technology is presented in all levels of the supply chain, from the communication with suppliers, through the manufacture process and until the delivery to clients. Moreover, from the point of view of logistics, the information technology contributes to the improvement of certain processes among the supply chain, as well to the reduction of labor costs, improvement of

the customer services and of the management of the transportation channels [Miraldes et al., 2015, Wieczerniak, Cyplik, Milczarek 2017]. Other researchers consider that IT has a positive effect on the performance of the supply chain [Yee, 2005]. Furthermore, the authors concluded that IT represents a tool which allows companies to face a dynamic market, improving their relationship with the customers.

Given all the above, there can be considered that the improvement of the supply chain at the level of companies depends on the technology and evolutions from the IT market. In this context, it is important for the IT sector to register a positive evolution, in other words it is important for the IT companies to be profitable and to continue to exist on the market ensuring the provision of the necessary tools for the logistic sector. Therefore, there was found interesting to analyze the IT market, as a vehicle for the improvement of the supply chain, and to determine which factors influence the profitability of the IT companies.

Determination of factors which impact the level of the profitability recorded by entities has became, during the time, one of the most analyzed topics in terms of financial management. Moreover, after reviewing the literature in this domain, there was observed that studies are performed at the level of various industries, but no study was performed in order to identify the factors which influence the profitability of the companies from the IT sector, at least not at the level of Romania. Given this, the aim of this paper is to determine those factors which impact the profitability obtained by the Romanian IT companies. The Romanian IT market was chosen, as during the time this industry recorded a significant evolution, becoming an attractive market for investors and also an important pylon for the development of the Romanian economy. Therefore, it was considered that the novelty and originality of the research is represented by the performance of the research at the level of the Romanian IT market. Moreover, the originality of the paper could be sustained by the fact that in order to identify the determinates on the profitability, the research started from the DuPont model, followed by the identification of additional

factors, in this respect being applied the Stepwise method. Therefore, the research objectives of this paper were as follows: first, to identify how the DuPont factors impact the profitability of the Romanian IT companies and second, to identify other additional factors that could influence the profitability of these companies. Going further, the main aim of the paper was to contribute to the finding of a model that could be used in order to perform a prediction of the profitability recorded by the Romanian IT companies.

The novelty and originality of the paper are also represented by the results of the research. The most important result which contributes to the scientific researches on the IT market is represented by the fact that in this industry is not important the experience on the market in order to be profitable, but the efficiency in which the assets are used. In other words, it could be interpreted that, in order to be profitable on the IT market, an entity should be up-to-date with the modern technology.

The results of this paper could be beneficial for the future researchers who intend to investigate the profitability of companies that operate on the IT market, in the sense that it could represent a starting point for identifying other determinant factors. In addition, this research could present importance for the financial management and also for investors, offering insights about the factors which should be observed in order to improve the profitability of an IT entity from Romania.

The importance of the study in the context of the logistic sector can be sustained by the fact that technology information constitutes a crucial strategic aspect for the logistics service providers [Sauvage, 2003].

The paper is organized as follows: the presentation of the literature review based on which were developed the research hypotheses, the description of the data and methodology used (sample and data description and presentation of the research model applied), the illustration of the results obtained and, in the end, the presentation of the conclusions followed by future directions for research and by the limits of the research.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The recent literature analysed the profitability recorded by companies from different countries and markets, using in this respect indicators like the financial return [Padachi, 2006], the return on assets [Deloof, 2003; Narware, 2010] or the return on equity [Avdalović, 2018].

According to Raza and Farooq [2017], the most important factor that should be used in order to assess the profitability of an entity is the return on equity (ROE). Regarding the studies performed in relation to ROE, part of them are based on the DuPont model [Burja and Marginean, 2014; Kharatyan et al., 2017; Raza and Farooq 2017]. According to the DuPont model, considering that ROE represents the ratio between net income and equity, it could be decomposed as follows:

$$ROE = \frac{Net\ Income}{Equity} = \frac{Net\ Income}{Sales} * \frac{Sales}{Assets} * \frac{Assets}{Equity}$$

Where:

$\frac{Net\ Income}{Sales}$ = Net Profit Margin. This indicator measures the capacity of an entity to generate net income based on the sales performed.

$\frac{Sales}{Assets}$ = Asset Turnover. This indicator shows the efficiency with which an entity uses its assets in order to generate revenues.

$\frac{Assets}{Equity}$ = Financial Leverage. This indicator illustrates the way in which companies finance their assets.

Simplifying, starting from the DuPont model, ROE could be decomposed as follows:

*ROE = Net Profit Margin * Asset Turnover * Financial Leverage*

Kharatyan et al. [2017] performed a study, at the level of the 90 largest nonfinancial entities that are part of the NASDAQ-100 index, investigating the factors that impact the level of ROE. The authors applied the ordinary least squares method and starting the analysis from the DuPont model. They concluded that irrespective of the industry sectors the most important factors that influence the level of ROE are the operating margin, the asset turnover, the financial leverage, the interest burden and the tax burden.

Avdalović [2018] performed a study at the level of a sample of industrial grinding companies in order to analyse the impact on ROE of the following factors: number of stocks, size, years of firm existence, financial leverage and book value per share. The author concluded that only the financial leverage, number of stocks and book value per share influence the level of ROE, while the other factors do not have a significant impact on ROE. Delen et al. [2013] studied the impact of certain financial ratios on ROE and concluded that the level of ROE is affected by indicators such as the financial leverage, the net profit margin and the sales growth ratio.

Denčić-Mihajlov [2013] analysed the impact of the account receivables on the profitability obtained by 108 companies listed on the Belgrade Stock Exchange. The results showed that there is a positive, but no significant relation between the profitability and the account receivables. Mbula et al. (2016) concluded that there exists a positive correlation between the financial performance of companies funded by government capital in Kenya and the accounts receivables. Ikechukwu and Nwakaego [2015] investigated the factors which affect the profitability of building materials entities from Nigeria using in this respect a multiple regression method. The results of their study show that the accounts receivables have a positive and significant impact on the profitability.

Akinyomi and Olagunju [2013] analysed the impact of the firm size on the profitability and concluded that firm size has a positive effect on the level of the profitability obtained by the manufacturing companies from Nigeria. According to Mulchandani [2016], the size of a firm has a positive impact on the level of ROE. Vintila et al. [2014] measured the size of a firm through the annual average number of employees.

Pervan at al. [2017] conducted a dynamic panel analysis on a sample of Croatian companies operating in the food industry. The results of their research reveal that the age of a firm negatively affects the performance of a firm. However, according to Akben-Selcuk [2016] the younger entities start with a decline in profitability and become profitable at an old age.

Moreover, according to some researchers, the factors which impact the profitability of companies can change among countries and industries [Hatem, 2014; Raza and Farooq 2017]. Given this, and in a first instance, having as a starting point the DuPont model, we found interesting to analyse how the financial indicators from this model impact the level of ROE recorded by the Romanian companies which operate on the IT market. Therefore, we expected to find that the indicators from the DuPont model (i.e. Net Profit Margin, Asset Turnover and Financial Leverage) positively influence the level of ROE, the aim of the paper being to observe the measure in which each of the three indicators influence ROE.

Furthermore, considering the results of the research studies described above, we also found interesting to analyse if those results could be validated also on the Romanian IT market. In this context, we established the following research hypotheses:

Hypothesis 1: Indicator Size influences the level of ROE.

Hypothesis 2: Indicator Age influences the level of ROE.

Hypothesis 3: Indicator Account Receivables influences the level of ROE.

Hypothesis 4: Indicator Sale Growth influences the level of ROE.

DATA AND METHODOLOGY DESCRIPTION

Sample and data description

We analysed the impact of the above mentioned factors on the level of ROE over the year 2016 (i.e. the most recent year for which we identified data). The sample used in this research is represented by the Romanian companies which operated in the IT industry during 2016. The search of these companies was performed within the Amadeus database, online version, number 289. In order to select our sample we applied the following criteria in the Amadeus database:
− we selected only companies located in Romania;
− we selected only active companies. The main purpose of applying this criterion was to eliminate those companies which are inactive, in insolvency or in bankruptcy. We considered that the inclusion of these companies in the sample could distort the results of the research, and therefore we selected only the active companies;
− as a last criterion, we selected those companies which operate in the IT industry, having the following NACE Rev. 2 codes: 6201 - Computer programming activities; 6202 - Computer consultancy activities; 6203 - Computer facilities management activities; 6209 - Other information technology and computer service activities.

The Amadeus database returned a number of 228 active companies which operate on the Romanian IT market. Due to the fact that for a part of the companies the Amadeus database did not contain all the financial information needed in order to perform our research, we included in the sample only 145 companies (i.e. those companies for which all the necessary data is available).

After we identified the research sample we applied a regression model. The variables included in the regression model are presented in table 1 below.

Table 1. Measurement of variables

Variables	Measurement
1. Dependent variable	
ROE	ROE was computed as the value of the net income divided by the value of the total equity.
2. Independent variables	
2.1 Variables from the DuPont model	
Net Profit Margin	This indicator represents the ratio between the net income and the value of the sales.
Asset Turnover	We computed this variable by dividing the value of the sales to the value of the total assets.
Financial Leverage	This variable represents the ratio between the total assets and the total equity.
2.2 Other independent variables	
Size	We considered that the size of a company is given by the number of its employees.
Age	This indicator represents the years of experience on the IT market of a company (i.e. the years between the date of incorporation and the date of this research).
Account Receivables	This indicator was computed as the value of the sales divided by the value of the account receivables.
Sales Growth	The Sales Growth measures the volume with which the sales of a company increased in 2016 compared to 2015.

Source: Authors` processing

Empirical methods

In the first step of the research we tried to confirm our expectation regarding the fact that the indicators from the DuPont model positively influence the level of ROE. Moreover, in this step we tried to achieve the first objective of the research (i.e. to observe the measure in which each of the three indicators influences ROE). Therefore, in order to do this we applied the following multiple linear regression model:

ROE = β0 + β1 x Net Profit Margin + β 2 x Asset Turnover + β 3 x Financial Leverage + ε, (1)

where ROE is the dependent variable, Net Profit Margin, Asset Turnover and Financial Leverage are the independent variables, β are the coefficients of the regression and ε represents the error.

After applying this model we tried to achieve our second research objective, respectively to identify other factors that could be included in the research model (other factors which could influence the level of ROE) and also to see if the research hypotheses could be validated. Therefore, in order to do this we created the following new

multiple linear regression model, including as independent variables the Size, Age, Account Receivables and Sales Growth:

ROE = β0 + β1 x Net Profit Margin + β 2 x Asset Turnover + β 3 x Financial Leverage + β4 x Size + β 5 x Age + β 6 x Account Receivables + β 7 x Sales Growth + ε   (2)

The statistical software used in order to analyse the above research models is SPSS (Statistical Package for the Social Sciences).

The main tests/ methods applied in SPSS were as follows:
− The significance test in ANOVA – for this test we used the output table of the ANOVA analysis from SPSS to check whether there is a statistical significant difference between our group means. We considered a confidence level of 95% and a significance threshold of 5% (100% - 95%);
− Shapiro-Wilk test – we used this test in order to check if our dependent variable (i.e. ROE) is normally distributed;
− Stepwise method – through this method we determined the statistical significant predictors in the regression equation. This method looks into the correlation matrix and chooses the independent variable that has the largest Pearson correlation with the

dependent variable and puts it into the regression analysis creating a first model. After that, it looks for the next highest predictors of the dependent variable, sequentially creating new models, until it finds a non-significant predictor;

− Enter method – through this method we determined the statistical significant predictors in the regression equation forcing all the independent variables into the multiple regression equation, irrespective of their statistical significance;

− Pearson correlation- this statistic tool was used in order to test if all our independent predictors are multicollinear.

EMPIRICAL RESULTS

Descriptive statistics

Table 2 presents the descriptive statistics for all the variables included in our empirical research.

Table 2. Descriptive statistics

| Variables | N | Minimum | Maximum | Mean | | Std. Deviation |
				Statistic	Std. Error	Statistic
ROE	145	.003	2.535	.377	.0286	.345
Net Profit Margin	145	.000	.679	.108	.0086	.104
Asset Turnover	145	.003	7.886	1.85	.1025	1.23
Financial Leverage	145	1.001	72.711	4.228	.771	9.281
Size	145	1	3635	241.480	42.081	506.725
Age	145	4	28	15.960	.519	6.244
Account Receivables	145	.009	124.888	5.765	.890	10.718
Sales Growth	145	.191	24.489	1.398	.173	2.084

Source: data from SPSS

As could be observed from the above table, the average profitability indicator (ROE) of the companies from our sample is of 37.735%. Moreover, these companies have an average of 241 employees and an average experience on the IT market of 16 years.

The average sale growth on the IT market during 2016 was of 139.760%. The high average value of the asset turnover shows that companies which operate on the IT market used their assets, during 2016, in an efficient way, in order to generate revenues. On the other hand, the high average value of the Financial Leverage shows that the assets used by the companies from the IT industry are financed from debts rather than from equity. Regarding the Net Profit Margin, during 2016, the companies from our sample generated an average net income of 0.108 EUR for every euro of sales. Looking at the average value of the account receivables there can be assumed that in the IT sectors companies are performing sales based on credit.

Results of the regression model

#### A. *Regression model including the factors from the DuPont model*

As we already mentioned, through this multiple regression we tried to analyse how the financial indicators from the DuPont model influence the variance of the profitability indicator (ROE). Thus, for this multiple regression analysis we selected three predicted variables and one dependent variable.

First of all, we checked if the dependent variable is normally distributed. In this respect, table 3 presents the results of the Shapiro-Wilk test which show that the non-statistically significant P-value is 0.811. Given this, we can assume that the dependent variable is normally distributed.

Table 3. Test of Normality

| | Shapiro-Wilk | | |
	Statistic	df	Sig.
ROE	.811	145	.000

Source: data from SPSS
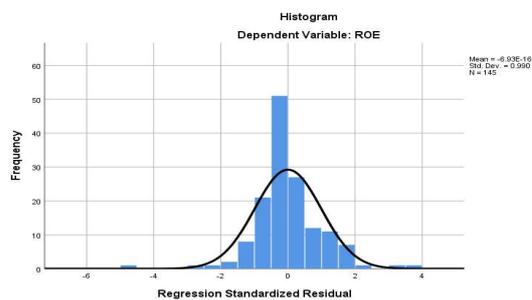
Source: data from SPSS

Fig. 1. Histogram

Moreover, to have another confirmation of the fact that the dependent variable is normally distributed, we generated from SPSS the above histogram for ROE, presented in figure 1. The histogram also shows that the values of ROE are normally distributed.

In the next step, we tested if all our independent predictors are multicollinear. Looking into the Pearson correlation results from the table 4 we can see that there is no value above 0.7 which means that all our predictors are independent.

Table 4. Matrix Correlations

	Variables	ROE	Net Profit Margin	Asset Turnover	Financial Leverage
Pearson Correlation	ROE	1.000	.587	.288	.061
	Net Profit Margin	.587	1.000	-.168	-.203
	Asset Turnover	.288	-.168	1.000	-.175
	Financial Leverage	.061	-.203	-.175	1.000

Source: data from SPSS

Table 5. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.758[a]	.575	.566	.227099

Notes: Predictors: (Constant), Financial Leverage, Asset Turnover, Net Profit Margin; Dependent Variable: ROE

Source: data from SPSS

Further on, based on the Model Summary output from the table 5, there can be observed that R Square value is 0.575 which means that 57.5% of the variance in the dependent variable (ROE) is explained by the predictor variables (Financial Leverage, Asset Turnover and Net Profit Margin).

Moreover, looking in the ANOVA results from table 6, considering the statistical significance P-value (which is well below the

P-value significance threshold of 0.05) and also the F-statistic we can conclude that our model is statistically significant. Therefore, the regression model is valid and the results of the regression are not accidental. More exactly, the impact of the analysed factors (Financial Leverage, Asset Turnover and Net Profit Margin) on ROE is significantly different from the role of chance.

Table 6. ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.827	3	3.276	63.512	.000[b]
	Residual	7.272	141	.052		
	Total	17.099	144			

Notes:
a. Dependent Variable: ROE
b. Predictors: (Constant), Financial Leverage, Asset Turnover, Net Profit Margin
Source: data from SPSS

Table 7. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.164	.047		-3.511	.001
	Net Profit Margin	2.402	.191	.723	12.600	.000
	Asset Turnover	.128	.016	.460	8.054	.000
	Financial Leverage	.011	.002	.288	5.016	.000

Notes:
a. Dependent Variable: ROE

Source: data from SPSS

The table 7 presents the results of the regression model applied. In the coefficients output from this table is presented the significance levels for all of the mean differences in ROE score between the constant and the predictor variables. Given that the statistical significance (P-value) for all of these variables is below 0.05, we can create three statistically significant relationships.

Based on the above results, we go further to confirm our expectation regarding the influence of the DuPont model on ROE. In order to do this, we applied the "t-test". Considering that the t test value of our independent variables is higher than the t critical value (1.645), and more than that the significance threshold of these variables is lower than 0.05, our expectation was confirmed. This means that the profitability obtained by the Romanian entities operating in the IT industry is influenced by the financial indicators from the DuPont model (i.e. Net Profit Margin, Asset Turnover and Financial Leverage).

Furthermore, the results show that the Net Profit Margin is significant and positively correlated with ROE. This means that the level of the profitability indicator is impacted by the capacity of an entity to generate net income based on the sales performed and as a consequence, indirectly by the management of the costs.

Going further, the Asset Turnover is positively correlated with ROE. Therefore, the efficiency with which an entity, which operates on the IT industry, is using its assets in order to generate revenues has a positive impact on the level of the profitability indicator (ROE in our case). More exactly, taking into account that the main assets for an IT entity are represented by the IT equipment and the software tools used, there can be concluded that the way in which are used these assets impact the profitability level. Based on this, there can be associated an efficient use with the existence of up to date software tools and modern IT equipment and can be concluded that the use of a modern technology can leads to an increase in the profitability level. However, this is only an assumption based on the results of our research and the validation of it needs a more deeply analysis.

Regarding the Financial Leverage, we can observe that there is a positive but small correlation between this indicator and the level of ROE. Therefore, the way in which companies from the IT sector are financing their assets impacts only in a small proportion the level of the profitability indicator.

The results obtained in relation to the impact of the Financial Leverage, Asset Turnover and Net Profit Margin on the level of ROE comply with the results of other researchers (Kharatyan et al., 2017; Avdalović, 2018 and Delen et al., 2013).

In the end, based on the results obtained, there can be created the following regression equation which can be used in order to predict the value of ROE for given values of our predictor variables:

ROE= -0.164 + 2.402 x Net Profit Margin + 0.128 x Asset Turnover + 0.011x Financial Leverage +ε (3)

B. Regression model including the factors from the DuPont model and other factors

Given the fact that based on the previously research model we found that 57.5% of the variance of ROE can be explained by the three independent variables (i.e. Financial Leverage, Asset Turnover and Net Profit Margin), the difference being explained by other variables, we tried in the next step of the research to identify those other factors which can influence the level of ROE. In this respect, in addition to the Financial Leverage, Asset Turnover and Net Profit Margin we included in the regression analysis the following four

factors: Sales Growth, Account Receivables, Size and Age of the company.

As we already tested the normal distribution of the dependent variable, we did not test this aspect again. Therefore, we applied the Stepwise method in order to determinate the statistical significant predicators in the regression equation. More exactly, through this method we tried to identify which of the four additional factors can be considered as a significant predictor in the new regression analysis. The results of the Stepwise method are presented in table 8 below.

Table 8. Stepwise method

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.587[a]	.345	.341	.279826
2	.706[b]	.499	.492	.245660
3	.758[c]	.575	.566	.227099
4	.781[d]	.610	.599	.218120

Notes:
a. Predictors: (Constant), Net Profit Margin
b. Predictors: (Constant), Net Profit Margin, Asset Turnover
c. Predictors: (Constant), Net Profit Margin, Asset Turnover, Financial Leverage
d. Predictors: (Constant), Net Profit Margin, Asset Turnover, Financial Leverage, Sales Growth

Source: data from SPSS

As can be observed from the above table, only one additional predictor was added to the existing model (i.e. Sales Growth). The introduction of this new independent variable determines an increase of the R Square at 0.610. This means, that 61.10% of the variance in the dependent variable (ROE) is explained by the predictor variables (Financial Leverage, Asset Turnover, Net Profit Margin and Sale Growth). The other three independent variables (Account Receivables, Size and Age) were excluded from the model as their statistical

significance P-value is above 0.05 (according to the information included in the table 9 below), this meaning that these variables do not impact the level of ROE. Moreover, the introduction in the regression analysis of the Sales Growth independent variable is also sustained by the coefficients table (table 10) according with the statistical significance P-value for this variable is below 0.05 and also by the fact that the t test value for this variable is higher than the t critical value.

Table 9. Excluded Variables[a]

Model	Variables	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
4	Size	.007[e]	.130	.896	.011	.876
	Age	-.066[e]	-1.227	.222	-.103	.953
	Account Receivables	.106[e]	.973	.332	.082	.236

Notes:
a. Dependent Variable: ROE
e. Predictors in the Model: (Constant), Net Profit Margin, Asset Turnover, Financial Leverage, Sales Growth

Source: data from SPSS

Table 10. Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
4	(Constant)	-.156	.045		-3.476	.001
	Net Profit Margin	1.989	.216	.599	9.197	.000
	Asset Turnover	.122	.015	.437	7.912	.000
	Financial Leverage	.010	.002	.268	4.829	.000
	Sales Growth	.037	.010	.224	3.584	.000

Notes: a. Dependent Variable: ROE

Source: data from SPSS

Therefore, our hypotheses according which ROE is dependent on the size of an entity, its experience on the market and the ratio of the account receivables were rejected, but the hypothesis according with ROE is impacted by the evolution of the sales growth was accepted (these results complying with those obtained only by Delen et al., 2013 and Pervan at al., 2017). More exactly, the level of ROE is not impacted by the number of employees from an IT entity, the experience on it on the IT market and the ratio of the account receivables, but it is impacted by the evolution of the growth sale.

Based on the results obtained, after the introduction of the Sales Growth in the regression model there can be created the following regression equation which can be used in order to predict the value of ROE for given values of our predictor variables:

ROE= -0.156 + 1.989 x Net Profit Margin + 0.122 x Asset Turnover + 0.010x Financial Leverage + 0.037x Sales Growth + ε (4)

Going further, we found interesting to analyse how the financial indicators from the DuPont model and also the additional factor identified impact the profitability (ROE) registered by the IT entities from Bucharest versus the profitability (ROE) recorded by the IT companies outside Bucharest.

As could be observed from the table 11 all the four independent variables positively influence the level of ROE for the IT companies from Bucharest. Moreover, for these companies 66.8% of the variance in the dependent variable (ROE) is explained by the four predictor variables (Financial Leverage, Asset Turnover, Net Profit Margin and Sale Growth). Regarding the companies located outside Bucharest, as could be observed, the Sales Growth do not statistically influences the level of ROE, but the other three variables explain in a proportion of 55.8% the variance of ROE. Therefore, the inclusion in the regression model of the Sales Growth indicator is justified only for the IT entities from Bucharest.

Table 11. Results of regression: Bucharest vs. non-Bucharest

Variables	Bucharest		Non-Bucharest	Sign.
	Coefficients	Sign.	Coefficients	
(Constant)	-.183	.012	-.101	.111
Net Profit Margin	2.520	.000	1.703	.000
Asset Turnover	.122	.000	.126	.000
Financial Leverage	.010	.000	.010	.003
Sales Growth	.028	.037	.000	.996
R Square	.668		.558	
F-Statistic	36.274		19.907	

Source: data from SPSS

DISCUSSION AND CONCLUSIONS

The aim of this paper was to investigate how the profitability of the Romanian IT companies is influenced by certain factors. The results of the regression applied confirm our expectation regarding the fact that the indicators from the DuPont model (i.e. Net Profit Margin, Asset Turnover, and Financial Leverage) impact the level of ROE recorded by companies subject to our research. Moreover, all these factors are positively correlated with ROE, the factor which has the highest impact being Net Profit Margin. Interpreting the results obtained from a financial analysis point of view, there can be concluded that profitability of the Romanian IT companies is influenced by the capacity of these entities to generate net income based on the sales performed and as a consequence, indirectly by the management of the costs. Going further, the level of the profitability is impacted by the efficiency with which an entity, which operates on the IT industry, is using its assets in order to generate revenues and also by the way in which companies from the IT sector are financing their assets.

In the next step of the research, we used the Stepwise method in order to identify additional factors which could influence the level of ROE. We found only one additional factor in this respect, namely the Sales Growth. However, we observed that this additional factor is significant only for the IT companies localized in Bucharest. There was surprising to find that the experience on the IT market does not influence the level of the profitability recorded by the companies. Correlating this result with the previous result obtained, according with the profitability is impacted by the efficiency with which an IT entity uses its assets in order to generate revenues, we assumed the fact that the experience on the market does not matter as long as there is used a modern technology (we considered that a modern technology could be used more efficient in order to generate revenues compared with an older one). We also found that the number of the employees and the Account Receivables do not impact the level of ROE recorded by the Romanian IT companies.

Considering the fact that, as far as we know, no similar study was performed at the level of the Romanian IT industry, the novelty and originality of the research is represented by the performance of the research at the level of this market.

Regarding the limits of our research, there can be mentioned the fact that our analysis was performed at the level of a single year. Therefore, other future research directions may imply the expanding of the research for more years and maybe at the level of other countries and also by the inclusion of other factors in the regression model (for e.g. starting from the expanded version of the DuPont model).

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ROLA IT W SEKTORZE LOGISTYCZNYM: WPŁYW MODELU DUPONTA NA RENTOWNOŚĆ PRZEDSIĘBIORSTW IT

STRESZCZENIE. **Wstęp:** Technologia IT jest obecna we wszystkich obszarach łańcucha dostaw, od komunikacji z dostawcami, poprzez proces produkcyjny aż po dostawy do klientów. Dodatkowo, IT ma pozytywny wpływ na pracę łańcucha dostaw. W tym kontekście ważne jest, aby sektor IT przeżywał pozytywną ewolucję, to znaczy, aby firmy IT były zyskowne oraz kontynuowały swoją działalność na rynku i były w stanie dostarczać potrzebnych narzędzi dla sektora logistycznego. Celem niniejszej pracy była analiza zyskowności przedsiębiorstw IT oraz identyfikacja czynników na nią wpływających. Istotność tych badań w kontekście sektora logistycznego opiera się na fakcie, że informacja technologiczna jest kluczowym aspektem strategicznym dla dostawców usług logistycznych i dlatego ważnym jest utrzymanie pozytywnej ewolucji sektora IT.

Metody: W pracy zastosowano analizę regresji, wychodząc od czynników modelu DuPonta a następnie uzupełniając o czynnik zidentyfikowany przy użyciu metody Stepwise.

Wyniki: Wyniki wskazują, że na zyskowność rumuńskich przedsiębiorstw IT ma wpływ marża netto, wskaźnik rotacji, dźwignia finansowa oraz wzrost sprzedaży.

Wnioski: Zyskowność badanych przedsiębiorstw jest uwarunkowana zdolnością generowania dochodu netto w oparciu o realizowaną sprzedaż (oraz pośrednio przez zarządzanie kosztami), wydajnością wykorzystania posiadanych zasobów, źródłem finansowania zasobów oraz wielkością sprzedaży. Prezentowane wyniki są istotne dla zarządzania finansowego, zarówno dla inwestorów jak i naukowców, oferując informacje na temat czynników, które należy kontrolować w celu uzyskania zyskowności przedsiębiorstwa IT w Rumunii. Istotność uzyskanych wyników dla sektora logistycznego należy zinterpretować następująco: znajomość ewolucji rynku IT w kraju oraz czynników wpływających na zyskowność daje przewagę z punktu widzenia aspektów logistycznych i dostarcza niezbędnych informacji w sytuacjach niepewnych. Dalsze badania powinny obejmować analizę korelacji pomiędzy ewolucją przedsiębiorstw IT oraz sektora logistycznego. Biorąc pod uwagę fakt, że jest to pierwsza tego typu praca dotycząca poziomu przemysłu IT w Rumunii, nowość i oryginalność prezentowanej pracy jest reprezentowana poprzez jej realizację na poziomie tego rynku.

Słowa kluczowe: rentowność, rynek IT, Rumunia, model DuPont, ROE, łańcuch dostaw

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