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FORECASTING FIRM PERFORMANCE: EVIDENCE FROM ROMANIAN FURNITURE FIRMS

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Abstract: *The aim at this paper is to propose an econometric model for analyzing economic performance in the furniture industry in Romania, conducted on a sample of 293 firms. The net profit was considered as a dependent variable and the turnover, expenses with employees, value added, current liabilities and inventories as independent variables. Five hypotheses were proposed, tested and validated by using multiple linear regression. The most significant results show that there is a positive significant relationship between net profit and value added and a negative significant relationship between net profit and expenses with employees. Since the model has been validated statistically, we consider that it can provide useful predictions in terms of economic performance analysis in the furniture industry.*

Keywords*: multiple linear regression, ANOVA, Durbin-Watson test, net profit estimation, value added.*

1. Introduction

The furniture industry holds special importance in Romania, given that a better use of wood is a strategic objective at the country level. Although there are important challenges for the sector, we can say that most investments in the furniture industry are profitable. In the recent years, the sector has been on an upward trend, and this is due to the outstanding quality of Romanian furniture, exported mostly to Central and Eastern Europe.

We also have chosen this sector because it is less studied in terms of performance. We found that there are numerous studies on furniture companies at the international level, but these were not related directly to economic performance, such as: analyzing sustainable strategies by assessing the environmental performance of a wardrobe built

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from a medium density particleboard (Iritani et al. 2015), participatory intervention in a furniture manufacturing company in order to improve both ergonomic and production outcomes (Guimaraes et al. 2015), development of an ergonomics guideline for the furniture manufacturing industry (Mirka 2005), ascertaining the roles played by the various innovation actors and their linkages to the process of technological innovations in the wooden furniture industry (Ng and Thiruchelvam 2012), development a robust optimization tools to derive robust combined lot-sizing and cutting-stock models when production costs and product demands are uncertainty parameters (Alem and Morabito 2013), implementation of cleaner production methodology as a management tool for achieving eco-efficiency and obtaining environmental and economic benefits (Massote and Santi 2013), study of reasons for inability of organizations furniture industry to get into international markets (Colak et al. 2015), exploring the changes taking place in a mature localized industry (US furniture industry), traditionally dominated by national players, when it faces the growing presence of international competition (Carpano et al. 2005) and assessing the global competitiveness of the wooden furniture industry (Han et al. 2009).

A few of the studies are focused on financial issues. For example, Degryse et al. (2012) had studied the impact of firm and industry characteristics on small firms' capital structure, while Feil et al. (2015) had identified and selected a set of indicators in order to measure the industrial sustainability of the micro and small-sized furniture industry.

In Romania, Burja and Marginean (2014) had studied factors that may influence the performance by the DuPont analysis in the furniture industry, while Budica et al. (2013) analyzed the exports of Romania between 1989 and 2010.

The challenges of the furniture industry in Romania are many, due to the fact that large and medium firms were affected significantly in the recent years mainly by two factors: the global economic crisis, which began with strong effects in 2009, and the military crisis in Eastern Europe, caused by the conflict in Ukraine, with its onset in February 2014. These two external factors are of a particular challenge to the industry in the sense that both have led and will lead to serious mutations in the sector.

The approach of this research assumes the hypothesis that developing an econometric multiple regression model in order to analyze economic performance in the furniture industry will bring significant information to stakeholders. Concerns on the use of accounting information including econometric modelling are well-founded, and that is because we live in the information age with information as a priority value, as a basis for management decisions.

It can be said that the economic and financial performance is the main goal, a goal firmly stated in the management of companies in the economy in general and in the furniture industry in Romania in particular. The interest is greater, because a superior processing of wooden materials represents a concrete way of getting the most of value-added in the wood processing sector. It is widely accepted in the industry that the recovery of wood in furniture products offers high added value and considerable profit from wood consumption as low as possible.

The economic challenges of the 21st century are likely to create new opportunities for a competitive environment; therefore, company management is facing various and unpredictable challenges, which generally require a firm and appropriate response. Econometric modelling is one of the current solutions, by which specialists quantify and describe economic phenomena on an advanced level in order to achieve predictions for future periods. Given the validity of the model, we believe that the approach is useful both for theorists and especially for the furniture industry practitioners.

The paper is organized as follows: Section 2 presents a literature review related economic and financial performance studies, Section 3 develops the research methodology and Section 4 presents empirical results and discussions, followed by Section 5, wherein we present the conclusions.

2. Literature Review

Economic and financial performance is a true current economic research centre, while the geopolitical and economic challenges prove important and allow many interpretations. Defined in numerous ways and from different research approaches, the concept still proves to be alive, constantly changing and evolving. Pesqueux (2004) highlights that, etymologically, the word *performance* belongs to ancient French literature and the term *performer* is taken over in Anglo-Saxon literature of the 15th century by the verb *to perform*. For the purposes of French understanding, the word meaning "performance" is equal to performing a procedure, a work that has the expected effects and is considered successfully completed. In the strict sense of the term, performance is the result amounted to a ranking perspective, competitive, built on a referential or measuring standard.

Miron and Burja (2015) consider that a meaningful analysis of performance should not be limited only to extracting information from the financial statements, but it should study in detail the factors that influenced this performance, an activity which will be entrusted to the company's management.

In general, we can say that econometrics is a simulation technique that evolved from statistics and economic sciences, being today one of the most used methods in modelling economic phenomena. Econometric modelling in economics assumes a statistical analysis of economic data and involves a major step of specification and validation of the model and a parameter estimation stage. Equations of the model represent algebraic relationships arranged as equations and the coefficients that appear based on performed calculations are determined based on historical data. The solution or the final equation obtained through modelling is used to make predictions on the analysed phenomenon (Neculai 2004).

There are, of course, limitations of econometric models. Among them, we can succinctly mention the following: the assumption of a certain balance in the economy, the inability to specify causal relationships between predictors and the only accurate mentioning of correlation relations (Neculai 2004). In our view, econometric models are useful in forecasting economic phenomena, while the method has been widely studied and validated by professional statisticians. It is well known that the overall economy fluctuates, and the existing balance is difficult to quantify, but based on the presumption that economic phenomena and economic processes are carried out by certain laws, and not chaotic (Marginean 2015), we consider econometric models useful.

In practice, the objective existence of links between phenomena forming an economic system – "economic laws, relatively stable and relatively repeatable" – is the theoretical support on which econometrics base their formal reflection. These links can be described by using statistical and mathematical models. Unlike deterministic models used in economics, the econometric models introduce in equations the random variable, or the random Ɛ. As the results of an econometric model represent an estimate, the economic phenomenon being only observed, statistical links between phenomena can only be estimated and not necessarily to show a causal link between terms (Tanasoiu & Iacob).

Advanced performance analysis models were designed to explain and quantify economic phenomena in a way that is accessible for analysis from multiple perspectives of economic reality. Given that an econometric model can be validated statistically, it will provide, with a reasonable error, a viable forecasting framework.

Econometric modelling is today a very useful tool for quantifying various economic phenomena, diverse and unpredictable, providing important support to managers. The main purpose to establish an econometric model of multiple linear regression in particular is the ability to return forecasts for the dependent variable by using independent variables, which are called "predictors" in literature. The possibility or impossibility to realize the indicator variables in samples, in a multiple linear regression econometric model, belongs a lot to the economic reality specific to the sector, to the econometric research methodology and less to the researcher's diligence.

The firm performance was analyzed in many studies in the literature, using statistical instruments, financial modelling or neural network techniques and both quantitative and qualitative variables. Thus, we found studies about the relation between activity-based costing adoption and performance and an investigation of the association between activity-based costing adoption and four manufacturing plant performance measures: cycle-time improvement, quality improvement, cost improvement and profitability (Maiga 2014). The performance is achieved when is creating an optimal balance between risk and income and quality management (Boca 2012).

The nonparametric approach to profit efficiency analysis at the firm and industry levels in the absence of complete price information was studied by Kuosmanen et al. (2010), which measured profit inefficiency in monetary terms using absolute shadow prices and evaluated all firms using the same input-output prices. Sen et al. (2015) found that the manufacturing enterprises of India and the UK should focus more on the manufacturing-based operational practices than non-manufacturing-based operational practices in order to improve environmental and as well as financial performance.

Copani and Urgo (2015) proposed innovative, flexibility-oriented business models based on innovative service value propositions that could increase manufacturers' competitiveness in turbulent environments and could represent a competitive factor for system suppliers. Their industrial implementation requires the optimization of manufacturing flexibility over the lifecycle of a system and the quantification of economic performance for customers and suppliers in order to manage risks and to shape sustainable contractual agreements.

The lessened concern for takeovers associated with a classified board structure reduces managerial risk-taking and increases managerial incentive for financial disclosure, with both effects inuring to bondholders' benefit and classified boards on average are associated with a lower firm performance (Chen 2012).

In contrast to the studies from developed economies, in a study developed on a data set of 1 000 largest manufacturing firms in such an advanced emerging economy as Turkey, firm-related factors (competitive strategies) did not significantly influence performance; instead, factors related to industry structure and business group membership are the strongest determinants of firm performance; further, it was shown that state support interacts with business group membership and is positively related to productivity (Karabag and Berggren 2014).

Simon-Elorz et al. (2015) defined a model for analyzing the impact that environmental variables such as age and size have had on economic performance, compared to marketing and management strategies adopted by the wineries, while Piltan and Sowlati (2015) developed a partnership performance index that is a multi-dimensional measure that includes multiple performance measures associated with the partnership drivers and accounts for their importance and interdependencies. Also, there were developed models on specific sectors in order to predict financial performance using Z score method (Bărbuţă-Mişu 2009; Bărbuţă-Mişu and Stroe 2010) that ensured the rate of success of 81.82%.

Using a structural equation modelling to investigate the associations among internal and external information system integration, quality and cost performance and firm profitability (Maiga et al. 2015), a study found that the direct effects of internal and external information system integration on firm profitability are not significant. Based on a survey responded by 121 manufacturing firms, Laitinen (2014) analyzed the influence of cost accounting change on the financial performance of Finnish firms, and he found that partial least squares show that cost the accounting change has a weak positive lagged main effect on performance, whereas a pricing system change has a strong negative effect.

Cost-efficiency indicators explain shorter-term financial performance better than value-added creation, which affects longer-term financial performance and future turnover growth (Lahtinen and Toppinen 2008). Also, from the perspective of the regression analysis results that influence the managerial point of view, in the short term, cost-efficiency is a prerequisite for the business, while in the long term, value-added creation is also needed to support the economic sustainability of the business. Marginean et al. (2015), using the Pearson correlations coefficient, revealed a strong direct correlation between net profit and human resources costs; respectively, there is a strong direct correlation between net profit and the costs of raw materials and consumables.

Mohamad et al. (2013) achieved a modelling company's net profit that helps to investigate the serious effects of the different financial conditions on the expected net profit, using two different net profit models developed using the multiple regression and the neural network techniques. They compared both models in order to investigate the predictive capabilities and recommend that the developed models should be continuously revised to arrive at a better level of accuracy and a more reliable tool for constructing companies' net profit assessments.

Starting from these studies, our approach aims at achieving an econometric multiple regression model for analyzing economic performance through a case study conducted on a sample of 293 firms in the furniture industry in Romania. Being a strategic industry for the Romanian economy, the furniture industry is facing important issues, of which the main could be the purchase of the most important raw material – wood – that is a chaotically exploited resource in Romania.

3. Research Methodology

In order to improve the quality and quantity of financial information for the use of stakeholders, in this paper, we propose an econometric model for analyzing economic performance in the furniture industry in Romania (NACE code 3109 – Furniture manufacturing). The study was conducted on a sample of 293 companies acting in the furniture sector, sample that we consider representative at sector levels in the national industry. The data used in the research were extracted from the Amadeus database (Analyse Major Database from European Source of van Dijk International Bureau database). The selection criteria for the companies used were: turnover and total assets higher than 1 million euro and number of employees higher than 50 in the year 2015.

In terms of representation, based on data extracted from the Eurostat website, the selected sample, reported at national industry-wide level, has the following representation:

1. The 3 285 entities, present in the sector in 2015, recorded a turnover of 1.65 billion euro. The turnover of the firms in the sample totalled 1.26 billion euros, namely 83% of the total turnover of the industry at national level;
2. Romania had 61 242 employees in the furniture industry in 2015. The sample totalled 41 808 employees, namely 68% of all employees in the furniture industry in Romania in 2015.

The statistical modelling was done by SPSS statistical modelling software. As dependent variable, net profit was considered and over 25 indicators in the companies' annual balance sheet and in the profit and loss account were included in multiple combinations, based on professional judgment, as independent variables or predictors.

The shape of the multiple linear regression model (Pecican 2009, p. 182), according to the literature, is the following:

$Y=\beta_0+\beta_1*X_1+\beta_2*X_2+\beta_3*X_3+\beta_4*X_4+\beta_5*X_5+\beta_6*X_6+\mathcal{E}$, where:

Y = net profit, the dependent or endogenous variable;
β_0 = the constant parameter or the intercept;
β_1 up to β_6 = independent, explanatory or exogenous variables;
$\mathcal{E}$ = error variable, interpreted as a residual error that explains the variation of Y due to factors that are not included in the model.

The model will interpret the linear relationship between the independent variables and the dependent variable and, by replacing, in the econometric model, values for the independent variables, it is possible to obtain, with reasonable error, a value for the dependent variable Y. The choice of the the best fit linear regression model was made using SPSS software through the Stepwise regression procedure. In SPSS, the method starts with zero predictors and then adds the strongest predictor to the model if its b-coefficient is statistically significant ($p < 0.05$). It then adds the second strongest predictor and the process run continuous until the last independent variable is tested. Because doing so may render previously entered predictors not significant, SPSS may remove some of them. Also, the non-stationarity of the process is not needed, considering data are provided for a single moment in time – reference year 2015 (no needed time series analysis).

Validation assumptions of the multiple linear regression econometric models tested in our research are:

- Between independent variables, there is multicollinearity;
- The variance of residuals (error) is normal and the same for all observations;
- The variables of residuals (errors) are not correlated;
- Multiple regression model parameters are statistically significant.

4. Empirical Results and Discussions

The approach of our research was extremely laborious, while the research was done in several stages on a sample that was significantly extended in the last stage, given that for the first 50 entities in the sector, initially analyzed under the report of turnover, the multiple regression model could not be statistically validated.

For implementing this model, the following hypotheses were considered:

H_1: Firms in the sector that grows value added will significantly increase net profit.

H_2: Firms in the sector that increases employee costs will significantly lower net profit.

H_3: Increase in short-term debt will negatively affect net profit.

H_4: Sector firms which increase the turnover will record an increase in net profit.

H_5: Growth of inventories for sector firms will adversely affect net profit.

As a technical working process, for working through the SPSS statistical modelling, net profit was used as the dependent variable or endogenous. As independent variables or predictors, the following 24 indicators were tested in SPSS, in variants and combinations, shortly named: *turnover*, *number of employees*, *equity*, *fixed assets*, *current assets*, *inventories*, *receivables*, *cash*, *total assets*, *financial revenues*, *financial expenses*, *gross profit*, *expenses for raw materials*, *expenses with employees*, *value added*, *tax*, *return on equity* (*ROE*), *return on assets* (*ROA*), *return on commercial* (*ROS*), *labor productivity*, *average costs with the personnel*, *rotation of assets*, *current liabilities and long-term liabilities*.

Of the original predictors, there were selected indicators that are in relation to net profit and step by step, those indicators, which together can statistically and correctly determine the multiple correlation connection with the net profit, were introduced in the model.

As a working procedure, depending on the correlation coefficient and the significance degree *sig.,* we removed and considered for inclusion in the model as independent variables the variables with an insignificant correlation coefficient and with a degree of significance $p > 0.05\%$. In our case, the econometric model was estimated based on a confidence level of 99% and $p < 0.001$.

After much processing, a model of multiple linear regression could be identified for our analysis, statistically correct and convincing, considering as dependent variable: *the net profit* (*NePr*) and as independent variables *the turnover* (*TurnOv*), *expenses with employees* (*ExEmpl*), *the value added* (*ValAdd*), *current liabilities* (*CuLiab*) *and inventories* (*Invs*). Because of the large number of statistical tests and checks carried out, we remember only the final model, according to research hypotheses.

Descriptive statistics of the selected pattern indicators are shown in Table 1:

TABLE 1. **Descriptive statistics for the sample population**

Indicator	Average	Standard Deviation	N
NePr (Net Profit)	145.8362	805.55902	293
TurnOv (Turnover)	4,307.2253	10,442.15596	293
ExEmpl (Expenses with Employees)	725.7270	1,428.80004	293
ValAdd (Value Added)	976.0956	2,471.04804	293
CuLiab (Current liabilities)	1,371.1945	3,668.21248	293
Invs (Inventories)	747.9522	1,412.81433	293

Source: authors' processing by SPSS.

The data returned by the SPSS program presents the following correlation matrix shown in Table 2 for predictors of the model and the dependent variable:

TABLE 2. **Descriptive statistics for the sample population.**

Indicator		NePr	TurnOv	ExEmpl	ValAdd	CuLiab	Invs
Pearson Correlation	**NePr**	1.000	0.629	0.556	0.717	0.394	0.472
	TurnOv	0.629	1.000	0.915	0.924	0.769	0.822
	ExEmpl	0.556	0.915	1.000	0.929	0.683	0.832
	ValAdd	0.717	0.924	0.929	1.000	0.708	0.816
	CuLiab	0.394	0.769	0.683	0.708	1.000	0.648
	Invs	0.472	0.822	0.832	0.816	0.648	1.000
Sig. (1-tailed)	**NePr**	/	0.000	0.000	0.000	0.000	0.000
	TurnOv	0.000	/	0.000	0.000	0.000	0.000
	ExEmpl	0.000	0.000	/	0.000	0.000	0.000
	ValAdd	0.000	0.000	0.000	/	0.000	0.000
	CuLiab	0.000	0.000	0.000	0.000	/	0.000
	Invs	0.000	0.000	0.000	0.000	0.000	/
N	**NePr**	293	293	293	293	293	293
	TurnOv	293	293	293	293	293	293
	ExEmpl	293	293	293	293	293	293
	ValAdd	293	293	293	293	293	293
	CuLiab	293	293	293	293	293	293
	Invs	293	293	293	293	293	293

Source: authors' processing by SPSS.

The summary of the econometric model is presented in Table 3:

TABLE 3. **The summary of the econometric model.**

Model	R	R^2	R^2 adjusted	Standard error of estimation	Test Result Durbin-Watson
1	0,717[a]	0.514	0.512	562.71160	
2	0,777[b]	0.603	0.601	509.15294	
3	0,788[c]	0.621	0.617	498.55055	
4	0,794[d]	0.631	0.626	492.93205	
5	0,800[e]	0.640	0.633	487.73279	1.937
a. Predictors: (Constant), ValAdd.					
b. Predictors: (Constant), ValAdd, ExEmpl.					
c. Predictors: (Constant), ValAdd, ExEmpl, CuLiab.					
d. Predictors: (Constant), ValAdd, ExEmpl, CuLiab, TurnOv.					
e. Predictors: (Constant), ValAdd, ExEmpl, CuLiab, TurnOv, Invs.					
f. Dependent Variable: NePr.					

Source: authors' processing by SPSS.

A correlation ratio of the R model can take values between -1 and 1, like the Pearson correlation coefficient, where, for R calculated 0.75 times, the intensity of the relationship between the two variables is straightforward and powerful. To interpret the results of the calculation we resort to the calculation of R^2, which is the coefficient of determination indicator providing information about the percentage of cases in the sample that are explained by the association of the correlation ratio R.

In general, in the case of multiple linear patterns, between calculated indicators there appears, besides R and R^2 the calculation of the indicator R^2 adjusted, which represents R^2 corrected for the number of predictors or independent variables. A R^2 coefficient of determination adjusted over 0.75 times discloses a very good result for the model, and a R^2 adjusted between 50% -75% is a good result. Give that our model returned a R of 0.80, R^2 of 0.64 and a R^2 adjusted of 0.633, we consider the results conclusive. However, ***the quality of the econometric model*** can be highlighted by calculating the difference between R^2 calculated and R^2 adjusted and the smaller the difference, the higher the model accuracy.

Given the correlation coefficient value of model R calculated 0.800 times, we conclude that net profit, as the dependent variable, is explained by the predictors extracted from the financial statements and kept in the model: ***turnover**, **expenses with employees**, **value added**, **inventories** and **short-term liabilities***. The coefficient of determination R^2 having the value of 0.640 indicates that the equation of the econometric model explains 64% of all cases in the sample. The resulting values are significant for the selected model and meaningful for the furniture industry sector level in Romania.

The ANOVA test of Table 4 confirms the model validity.

TABLE 4. **ANOVA test results or the analysis of variance.**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97,342,690.278	1	97,342,690.278	307.420	,000[b]
	Residual	92,143,505.859	291	316,644.350		
	Total	189,486,196.137	292			
2	Regression	114,307,547.837	2	57,153,773.919	220.469	,000[c]
	Residual	75,178,648.299	290	259,236.718		
	Total	189,486,196.137	292			
3	Regression	117,654,478.970	3	39,218,159.657	157.786	,000[d]
	Residual	71,831,717.167	289	248,552.655		
	Total	189,486,196.137	292			
4	Regression	119,507,379.716	4	29,876,844.929	122.959	,000[e]
	Residual	69,978,816.421	288	242,982.001		
	Total	189,486,196.137	292			
5	Regression	121,213,697.601	5	24,242,739.520	101.910	,000[f]
	Residual	68,272,498.535	287	237,883.270		
	Total	189,486,196.137	292			
a. Dependent Variable: NePr						
b. Predictors: (Constant), ValAdd.						
c. Predictors: (Constant), ValAdd, ExEmpl						
d. Predictors: (Constant), ValAdd, ExEmpl, CuLiab						
e. Predictors: (Constant), ValAdd, ExEmpl, CuLiab, TurnOv.						
f. Predictors: (Constant), ValAdd, ExEmpl, CuLiab, TurnOv, Invs.						

Source: authors' processing by SPSS.

The ANOVA test or the variance analysis is a significance test that is performed in order to check the equality of three or more averages. Thus, we determine whether the model results are not random, testing the global significance of predictor variables.

The value obtained by our model through the ANOVA test is very good, confirming the global significance of the independent variables. The Fisher test value (F) is sufficiently large (greater than F critical of the Fisher table, for the number of observations and degrees of freedom). A result of 0.05 for the significance degree shows that, with a probability of error of 5%, we can say that our model explains significantly more variation than other unforeseen or uncontrollable factors which could intervene.

Regarding the econometric model parameter estimation, we will analyse the information in Table 5.

Each econometric model has included a constant, the intercept, besides independent variables to adjust prediction, and under the constant, we may find the independent variables of the model or the predictors. On columns, we first have the independent model coefficients together with the intercept, non-standardized coefficients, standardized coefficients, the t-test and the significance degree. However, Table 6 contains the first statistics on hypotheses check regarding multicollinearity.

TABLE 5. **Econometric model coefficients.**

Model	Non-standardized Coefficients		Standardized Coefficients	Test t	Sig.	Statistics for collinearity	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	44.847	33.442	/	1.341	0.181	/	/
ValAdd	0.477	0.036	1.462	13.189	0.000	0.102	9.790
ExEmpl	-0.459	0.061	-0.814	-7.490	0.000	0.106	9.409
CuLiab	-0.054	0.012	-0.244	-4.377	0.000	0.404	2.475
TurnOv	0.028	0.009	0.357	3.171	0.002	0.100	10.000
Invs	-0.102	0.038	-0.179	-2.678	0.008	0.281	3.560
Dependent Variable: NePr. Predictors: (Constant), ValAdd, ExEmpl, CuLiab, TurnOv, Invs.							

Source: authors' processing by SPSS.

The equation coefficients of the regression model will be taken over from column B, namely the non-standardized coefficients. Here, too, on the standard error column, we may find the standard deviation of regression coefficients showing the typical range of our prediction interval. For example, for the predictor of turnover, the deviation is 0.009 units, namely turnover may vary from entity to entity with ± 9 euros (0.009 * 1000 euros, the unit of measurement for all five indicators being thousands of euros). Similarly, deviations can be calculated for all predictors in the model.

On the column of standardized coefficients, we may reflect values for standardized regression coefficients that describe our model where we consider standard scores (z) of the variables. These coefficients are used in the case when several variables are included in the model, which is expressed in different units of measure to facilitate their explanation (Jaba & Grama 2004, p. 257). In our case, all predictors are expressed in thousand euros and it is not appropriate to use standardized coefficients.

Using the t-test, we may check the probability that each parameter is void in the model, formulating the hypothesis $H_0{:}\beta=0$. Given that the level of significance (Sig) for predictors is less than 0.05 in all cases, the null hypothesis H_0 is rejected, so β, the slope of the regression line, corresponds to a significant global link between independent variables and the dependent variable. However, the value for the t-test highlights the importance of each variable in the model (the greater the t-test value, the more important the predictor is in the model), the predictors being arranged in rows from top to bottom in the table, in order of importance for the prediction of the dependent variable.

Collinearity statistics return calculated values that shall mean the existence or the inexistence of an event of collinearity between the model predictors. Statistics of tolerance are calculated, considering only independent variables, the dependent variable being excluded from the model. Several tests can be performed in order to detect the predictors' collinearity, as follows: the calculation for the tolerance index, the index of the VIF variable (the variance inflation factor), the Eigenvalue value (the number of links that exist between the independent variables), the condition indices for predictors and the like (Jaba & Grama 2004, pp. 262–265).

The collinearity test results are shown in Table 6.

TABLE 6. **A collinearity diagnosis for the econometric model.**

Predictor	Tolerance	VIF	Eigenvalue	Condition Index	T Test	Sig.
ValAdd	0.102	9.790	4.572	2.410	13.189	0.000
ExEmpl	0.106	9.409	0.787	3.631	-7.490	0.000
CuLiab	0.404	2.475	0.347	5.118	-4.377	0.000
TurnOv	0.150	9.500	0.175	8.557	3.171	0.002
Invs	0.281	3.560	0.062	8,980	-2.678	0.008

Source: authors' processing by SPSS.

In terms of studying multicollinearity in our case, the indicators show that there is multicollinearity. Condition indices, tolerance or the eigenvalue index show no signs of the existence of collinearity issues. The condition index value, greater than **15,** may indicate a possible problem of collinearity and a condition index above **30** surely indicates a serious collinearity problem (Jaba & Grama 2004, pp. 262–265). Moreover, the statistical significance of predictors is high, given that ***the value of T tests and the significance value of p <0.01*** shows predictors better positioned towards the significance threshold of p <0.05 accepted in practice.

Regarding the hypothesis of errors mismatch, we will use the Durbin-Watson test analysis. The Durbin-Watson is a statistic test that checks the serial correlation of errors, and if errors are not correlated then the test will be around 2. Although we know from theory that a value in the neighbourhood of 2 of the Durbin-Watson test is a good value, the problem will be the critical confrontation between tables including the Durbin-Watson test.

We may formulate the null hypothesis (H_0) and the alternative hypothesis (H_1):

- *H_0 : p = 0, null hypothesis, there is no autocorrelation;*
- *H_1 : p ≠ 0, alternative hypothesis, there is autocorrelation.*

The value of 1,937 obtained from our model in Table 3 for the Durbin-Watson test puts us in the acceptance of the null hypothesis, that 1.937 belongs to the range [1.623;

2.275] (Ganea and Cârstina 2013), for which it is accepted that there is no correlation between errors.

Since the validation tests were checked for the estimated model, we can say that the outcome of our research is a valid multiple regression model and the parameter value of predictors indicates the increase or decrease of the net profit, driven by the growth in a unit of each independent variable in part, while the remaining independent variables or predictors remain constant.

The equation of the regression model is given by the non-standardized coefficient values as follows:

$$\text{Ne Pr} = 44.847 = 0.477^{*}\ \text{VaAdd} - 0.459 \times \text{ExEmpl} - 0.054 \times \text{CuLiab} + \\ + 0.028 \times \text{TurnOv} - 0.102 \times \text{INVS}$$

The economic understanding of the multiple linear regression model equation can be interpreted consistent with research hypotheses proposed at the beginning of the research, as follows:

Value added (ValAdd) has a very important role on the firm's ability to generate profit. For the independent variable accounting for the value-added indicator, we formulated in our early analysis the H_1 hypothesis, according to which we assumed that *firms in the sector which increase the value-added will significantly increase net profit.* Considering that by value-added all stakeholders is remunerated, a high value-added will assure a high remuneration of the firm by net profit. The table with the econometric model coefficients shows the value 0.447 for the value-added coefficient. Thus, we can say that while the value added has increased by one unit, i.e., 1 000 euros, and the other indicators of the model remain constant, the net profit will increase by 447 euros. *The H_1 hypothesis is therefore accepted.*

The expenses with employees (EcEmpl) are the second predictor for our model, for which we formulated the hypothesis that *sector firms growing employees' expenses will significantly decrease net income (H_2).* This result shows that if a firm increase expenses with personnel expenses, then the net profits will reduce. From the table with econometric model coefficients, we may observe the value -0.459 for the coefficient of employees' expenses. It can be said that while the expenses with employees increased by 1 000 euros, the other predictors remaining constant, the net profit would have decreased by 459 euros. *The H_2 hypothesis is therefore accepted.* It may be mentioned that from the level analyses performed in the case of firms in the furniture industry, the costs of raw materials and supplies added with expenses aggregated with employees may represent over 75% of the total entities in the sector. Representing the bulk of spending, certainly the management of these two categories of operating expenses can make the difference between a profitable and a non-profitable entity.

Current liabilities (CuLiab) are the third predictor maintained in our model, an indicator with impact on net profit in the analyzed context. For short-term liabilities, we have formulated the hypothesis that *an increase in short-term liabilities will negatively affect net profit (H_3)*. This result shows the real situation of firms that use short-term funding. These liabilities generate expenses with interest that will lead to reducing of the net profit. From the table with econometric model coefficients, we may note the value -0.054 for the coefficient of short-term liabilities. It can be said that while the short-term debt increased by 1 000 euros, other predictors remaining constant, the net profit would have decreased by 54 euros. *H_3 hypothesis is thus accepted.*

Turnover (TurnOv) is the fourth predictor for which we formulated the hypothesis that *the firms in the furniture industry which increase the turnover will record a net profit growth (H_4)*. From the table with econometric model coefficients, we may note a 0.028 value for the turnover coefficient. Thus, we can say that while the turnover has increased by one unit, i.e. 1 000 euros, and the other indicators of the model remain constant, the net profit will increase by 28 euros. *Hypothesis H_4 is therefore accepted.*

Inventories (Invs) represent the last predictor for our econometric model, for which we formulated the hypothesis that *the increase in inventories for firms in this sector may adversely affect net profit* (H_5). The increase of inventories may be the result of the existence of immobilized inventories that reduces firm performance. From the table with econometric model coefficients, we may note the value -0.102 for the inventories coefficient. Thus, we may say that while stocks increased by 1 000 euros, the other predictors remaining constant, the net profit would have decreased by 102 euros. *The H_5 hypothesis is thus accepted.*

6. Conclusions

The recovery of accounting information for analyzing economic performance may take the form of an econometric multiple regression model, like the one shown in this paper, regardless of the industry sector. The need for complex analytical information is implicit in the current economic context, especially in the case of large entities, as performance reports are required by stakeholders.

A validation of the presented econometric model, with implementation in the furniture industry in Romania, with no claim to completeness, provides valuable information both to academic professors concerned with issues specific to research on the performance of economic entities and to practitioners in the furniture industry. Since the econometric model was validated, predictions can be made based on the net profit of predictor variables and the coefficients of each predictor. We also consider that the model can be applied to other sectors of activity.

Referring to the approach of research through a multiple regression econometric model, we believe that this should be done in a well-defined context, given that we deal with more issues that are relevant in the study of the performance of an entity. It is better to conduct a forecast of this nature if we are to consider a comprehensive analytical framework. Complementary, an overview is necessary, at least on the firm's financial position and performance. For a high accuracy of interpretation, performance analysis results, through the presented econometric model, should be correlated with the results of the analysis of the economic and financial indicators and indicators of financial statements and of the derivative analysis indicators. A substance analysis that will be conducted specially and dynamically will complete the forecast.

In the furniture industry in Romania, research, innovation and development are neglected in a sector of that is activity-dependent on creation, development and innovation, as these elements may improve performance (Roszko-Wójtowicz and Białek 2016). This is a profoundly negative element in the development of the sector, a genuine obstacle to the promotion and growth of the sector internationally. The interest of the Romanian economy requires that the furniture industry is supported by tax cuts and measures providing incentives to purchase wood from national forestry as a solution to the problem of timber exports chaotically practiced at this time. Moreover, in this sector, elements related to performance must be constantly researched and we must seek ways to sustainably develop the industry.

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