STUDY ON THE INFLUENCE OF THE FINANCIAL INDICATORS ON FINANCIAL BALANCE OF THE ECONOMIC ENTITY

Ruxandra-Maria PAVEL[1]

Lucian Blaga University of Sibiu, Romania

Abstract

The present study highlights the influence of the factors with significant impact on the financial balance (expressed through the working capital fund) in a number of 26 companies from the hospitality and the restaurants industry listed on the Bucharest Stock Exchange during the period 2007-2017, respectively: indebtedness , liquidity, profitability and operational factor. The results have shown that an increase in liquidity and profitability will result in an increase in the working capital, which will lead to the financial balance being maintained and maintained. On the other hand, an increase in the indebtedness and the duration of debt recovery will entail a reduction in the working capital, with a negative effect on the balance of financial.

Keywords: *financial balance, working capital, multivariate regression, operational factor, financial leverage*

JEL classification: *G32, C21*

1. Introduction

Financial ratios expressed in the form of financial ratios are widely used in the assessment of financial position and performance, the assessment of the company's business performance and the inherent risks and the assessment of the financial balance.

Regarding the concept of financial equilibrium, the literature gives it more definitions. Thus, Dănuleţiu AE (2006, p. 487) appreciates the financial balance of a company through the existence of reliable and strong links, reflected by a system of correlations between the necessary financial resources

[1] *Ph.D. student, "Lucian Blaga" University, Faculty of Economic Science, Sibiu, Romania, e-mail: pavel_ruxandra_maria@yahoo.com*

(resulting from the application in practice of the objectives of the entities) and effective and practical actions taken to obtain financial resources with minimal costs and risks.

Miron Vasile C.I. (2015, p. 357) considers that a healthy financial balance must not be strictly observed by the correlation between the need for financial resources in order to obtain the necessary funds but there is a financial equilibrium only when this correlation is expressed by indicators falls within normal limits.

The working capital is considered a useful tool in assessing the financial position, solvency and financial balance of a company (Arunkumar O.N., T. Radharamanan 2013, p.10).

The study on working capital is considered to be one of the fundamental objectives of a company's financial analysis with implications for the value of the company and the realization of an analysis on the management of the working capital is essential for a company, as a result of its effects on profitability and financial equilibrium (Smith 1980).

Siminica M., Cîrciumaru D. and Ganea M. (2008, p.306), considers that in assessing the financial balance of a company, the following aspects should be studied: the liquidity and solvency ratios and the correlation between the working capital, the working capital requirement and net cash flow. The same idea is maintained by Nicolae Balteş and Alina Teodora Ciuhureanu (2013, p.218), mentioning that the assessment of the financial equilibrium of the company should be supplemented by the analysis of the financial solvency indicators, but also by other indicators that express the management of the company.

2. Literature review

Tan, Koh and Low (1997) used 29 financial ratios for companies listed on the Singapore Stock Exchange (SES) during the period 1980-1991, obtaining 8 factors that the authors believe can appreciate the financial status of the companies.

Öcal, Oral, Ercan Erdis and Vural (2007) used 25 financial ratios at the level of construction industry companies in Turkey during the period 1998-2001, gaining 5 significant factors underlying the determination of the financial situation of the companies.

Anupam De, Gautam Bandyopadhyay, B.N. Chakraborty (2011), have used 44 financial indicators at the cement-producing companies in India for 10

years, identifying 8 significant factors in assessing the financial equilibrium of these companies.

Arunkumar and Radharamanan (2013), analyzed 11 variables likely to influence the working capital in India's manufacturing companies, identifying four factors, namely assets, financing policy, convertibility and operational factor that influence the working capital.

3. Methodology of research

The study aims to highlight the impact of financial indicators on financial balance (expressed through working capital) by reducing the number of variables to a manageable level, with minimal loss of information. The sample consists of 26 companies belonging to the hotel and restaurant industry listed on the Bucharest Stock Exchange for the period 2007-2017. Data processing was carried out using the statistical and mathematical software Excel 2016 and E-Views 9.

The study uses as independent variables the 12 financial indicators presented in table no.1.

Table 1: Financial indicators

Name	Abbreviations	Calculation formula
Financial leverage	LF	Total Debt / Equity
Financial autonomy rate	RAF	Equity / Total Liabilities
Financial stability rate	RSF	Permanent Capital / Total Liabilities
General solvency ratio	RSG	Total Asset / Total Debt
Patrimonial solvency rate	RSP	Equity / Permanent Capital
Current liquidity rate	RLC	Current Assets / Current Liabilities
Immediate liquidity rate	RLI	Current Assets - Current Inventories / Liabilities
Duration of recovery of receivables	DRC	Claims / Turnover × 365 days
Inventory conversion time	DRS	Stocks / Turnover × 365 days
Duration of use of attracted resources	DRD	Current Debt / Turnover × 365 days
Return on assets	ROA	Net profit / Total assets * 100
Return on equity	ROE	Net profit / Equity * 100

Source: processing of the authors

The model of the factorial analysis considered as a series of multiple regressions, predicting each of the observable variables Xi from the values of the observable common factors fi, is represented mathematically (Gorsuch, 1983):

$X_1 = \mu_1 + l_{11}f_1 + l_{12}f_2 + ... + l_{1m}f_m + \epsilon_1$ Equation (1)

$X_2 = \mu_2 + l_{21}f_1 + l_{22}f_2 + ... + l_{2m}f_m + \epsilon_2$

⋮

$X_p = \mu_p + l_{p1}f_1 + l_{p2}f_2 + ... + l_{pm}f_m + \epsilon_p$

where: $\mu_{1,2,...p}$ - represent intercept terms for multiple regression models;

l_{ij} - regression coefficients for all of these multiple regressions, called "factor loads", collected in the loading matrix (The Pennsylvania State University, course):

$$L = \begin{pmatrix} l_{11} & l_{12} & \cdots l_{1m} \\ l_{21} & l_{22} & \cdots l_{2m} \\ \vdots & \vdots & \vdots \\ l_{p1} & l_{p2} & \cdots l_{pm} \end{pmatrix} \Rightarrow \text{matricea factor loadings} \quad \text{Equation (2)}$$

ε_i - model errors, also called specific factors. Here, εi = the specific factor for the variable i.

The basic model is a regression model and each of the response variables X is a linear function of the common factors observed f_1, f_2 ... f_m, so the notation shown above will become (The Pennsylvania State University, onlinecourses):

$X = \mu + Lf + \varepsilon$ Equation (3)

The Goodness-of-Fit test compares the variance-covariance matrix under the parsimonious model with the variance-covariance matrix without any restriction, under the assumption that variations and covariances can take any value. The KMO statistical test (Kaiser-Meyer-Olkin) determines the intensity of the relationships between F variables and highlights whether the X_i components fulfill the independence hypothesis.

The scores of the factors extracted from the analysis are used to determine their impact on the bearing fund, using multivariate regression.

Dependent variable (working capital) = Current assets - Current liabilities

The independent variables used in the multiple regression analysis are the financial rate scores.

Starting from the standard model for the determination of the multiple linear relationships between several variables (Baltagi B.H., 2008, p. 49):

$Y = \alpha + \beta_1 F_1 + \beta_2 F_2 + ... + \beta_n F_n + \epsilon$ Equation (4)

where: Y = dependent variable; $F_1, F_2, ..., F_n$ = independent variables; a and b intersection point and ε = standard error.

To determine the impact of the independent variables on the bearing fund, the multiple regression model to be tested is:

$FR = \alpha + \beta_j F_j + \epsilon$ Equation (5)

where: α = the test-associated constant for each model; βj = factor coefficients associated with the factor; Fj = the factor resulting from the factorial analysis; ε = standard error.

4. Descriptive analysis

At the top of table no. 2, we observe basic information about the settings used in the estimate and the baseline status. We appreciate that the estimate used all 260 comments in the work file (26 companies x 10 years).

Table 2: Analysis of covariance: Ordinary correlation

Factor Method: Principal Factors
Covariance Analysis: Ordinary Correlation
Sample: 2007 2017
Included observations: 286
Number of factors: Kaiser-Guttman
Prior communalities: Squared multiple correlation

	Unrotated Loadings					
	F1	**F2**	**F3**	**F4**	**Communality**	**Uniqueness**
DRC	0.2492	0.0100	0.0309	0.6104	0.4359	0.5641
DRD	-0.0756	-0.0790	-0.1310	-0.2761	0.1054	0.8946
DRS	0.1273	-0.1115	0.0141	0.6999	0.5188	0.4812
LF	-0.8609	0.3632	0.1466	0.1933	0.9320	0.0680
RAF	0.8101	-0.3316	0.4270	0.0133	0.9488	0.0512
RLC	0.4878	0.8601	0.1275	0.0188	0.9944	0.0056
RLI	0.4880	0.8618	0.1267	0.0134	0.9972	0.0028
ROA	0.2267	-0.1893	0.8346	0.0340	0.7851	0.2149
ROE	0.4659	-0.4055	0.6913	-0.1773	0.8909	0.1091
RSF	0.7873	-0.4368	0.0365	0.0563	0.8154	0.1846
RSG	0.4525	0.6803	0.0237	-0.0633	0.6723	0.3277

RSP	0.1814	0.1285	0.4090	-0.0668	0.2213	0.7787

Source: authors' processing in the E-Views 9 statistical program

In the second part of table no. 3 shows estimates of untreated orthogonal loads, communities, and estimates of uniqueness obtained from the estimate. We first notice that by applying the Kaiser-Guttman method, four factors were preserved: "F1, F2, F3 and F4". A brief review of untreated charges indicates that LF, RAF and RSF are loaded on F1 - leverage, RLC and RLI are loaded on F2 - liquidity, ROA and ROE are loaded on F3 - profitability and DRC and DRS are loaded on F4 - operational factor.

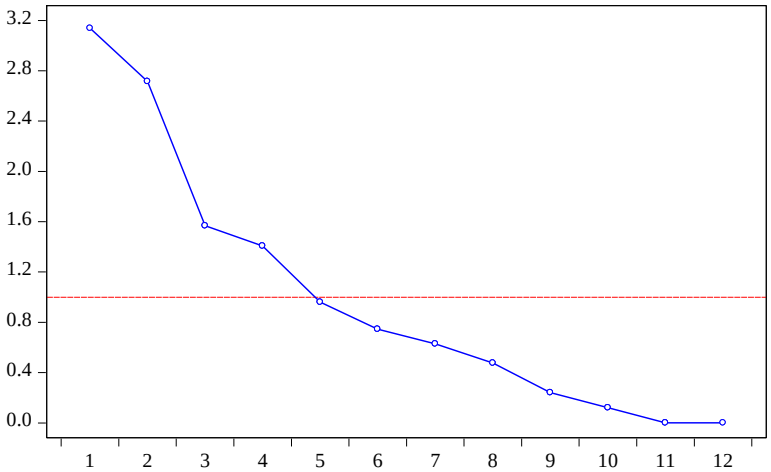
By using the Benzecri's criterion, the number of extracted components has been determined, with the value of the single vector associated with each component being greater than 1 (Jaba, E., Robu, I.-B., 2011, p.39). Table no. 3 provides information on the total variance and proportion of the common varieties represented by each of the factors and the correlation matrix is shown in Diagram 1.

Table 3: Variation of extracted components

Factor	Variance	Cumulative	Difference	Proportion	Cumulative
F1	3.0060	3.0060	0.3921	0.3858	0.3858
F2	2.6139	5.6200	1.3342	0.3355	0.7213
F3	1.2796	6.8996	0.3883	0.1642	0.8856
F4	0.8912	7.7909	---	0.1144	1.0000
Total	7.7909	7.7909		1.0000	

Source: authors' processing in the E-Views 9 statistical program

Diagrama 1: Observed Matrix Scree Plot



Source: authors' processing in the E-Views 9 statistical program

It is noted that the total variance represented by the four factors is 7.7909, representing almost 65% of the total variation (the sum of the correlation matrix diagonals). Factor F1 represents 38.5% of the common variance, F2 represents 33.5%, F3 represents 16.4%, and F4 represents 11.4%.

Testing the extent to which the matrix of correlations differs from an identity matrix and the degree of common variation of the variables was performed by the Kaiser's test (Table 4).

Table 4: The value of the Kaiser's test

Kaiser's Measure of Sampling Adequacy

	MSA
DRC	0.8005
DRD	0.7550
DRS	0.7846
LF	0.8451
RAF	0.7705
RLC	0.6830
RLI	0.7799
ROA	0.6567
ROE	0.6554
RSF	0.6741
RSG	0.7925

RSP	0.7259
Kaiser's MSA	**0.74365**

Source: authors' processing in the E-Views 9 statistical program

The KMO test can take values between 0 and 1, 0 indicating the absence of a correlation between the initial variables and 1 indicates the existence of a significant correlation (Lebart, L., Piron, M., Morineau, A., 2006). The literature (Kaiser, H.F, 1974, p.33) recommends a Kaiser's MSA test value of over 0.6 to validate the analysis. The value of the test is 0.745, thus revealing a significant relationship between the variables analyzed.

The correlation coefficients between the initial variables with each retained factor is shown in table no. 5.

Table 5: Coefficients of correlation of the initial variables with each retained factor

Rotation Method: Orthogonal Varimax
Convergence achieved after 11 iterations

Rotated loadings: L * inv(T)'

	F1	F2	F3	F4
DRC	0.1334	0.1198	0.0311	**0.6346**
DRD	-0.0497	-0.0877	-0.1611	-0.2631
DRS	0.0908	-0.0413	-0.0118	**0.6153**
LF	**-0.8807**	-0.0256	-0.0810	-0.1042
RAF	**0.8255**	0.0408	0.4956	0.1409
RLC	0.0044	**0.9966**	0.0153	0.0271
RLI	0.0044	**0.9982**	0.0166	0.0218
ROA	0.3088	0.0069	**0.8194**	0.0545
ROE	0.4147	0.0122	0.6277	0.0921
RSF	**0.8871**	0.0052	0.0238	0.1665
RSG	0.0644	0.8098	0.1010	-0.0451
RSP	0.0328	0.0679	0.4351	-0.0123

Source: authors' processing in the E-Views 9 statistical program

It is noted that the F1 factor is significantly and negatively influenced by the 88,07% change in the financial and positive leverage ratio of 82,55%, respectively by 88,71% by the change in the indicators of the financial autonomy rate and the financial solvency ratio. The variation of the F2 factor is

positively influenced, by more than 99%, by the variations in the liquidity indicators. The variation in the economic profitability rate influences in the positive sense 81.9% the variation of the F3 factor. Factor F4 is positively influenced by the variation in the debt recovery duration (63.4%) and the inventory conversion time (61.5%).

Following the application of the component extraction method and Varimax as a rotation method, the independent variables can be grouped into four factors: solvency and leverage, liquidity, profitability and operational factor.

Factor	Variables	C	Factor Loading	Category
F1	Financial leverage Financial autonomy rate Financial stability rate	LF RAF RSF	- 0.881 0.825 0.887	Solvency and leverage
F2	Current liquidity rate Immediate liquidity rate	RLC RLI	0.996 0.998	Liquidity
F3	Return on assets	ROA	0.819	Profitability
F4	Duration of recovery of receivables Inventory conversion time	DRC DRS	0.634 0.615	Operational factor

In table no. 6 shows the correlation between the parameter estimates according to the score associated with the main components.

Table 6: Correlation between parameter estimates in function of score associated with main components

	Solvency and leverage	Liquidity	Profitability	Operational factor
Solvency and leverage	1.0000			
Liquidity	-0.7809	1.0000		
Profitability	-0.8234	0.6113	1.0000	
Operational factor	0.5439	-0.7038	-0.6211	1.0000

Source: authors' processing in the E-Views 9 statistical program

It is noted that the reduction in the debt factor entails the increase in the profitability and liquidity factors. At the same time, the reduction of the debt recovery and inventory conversion times has a positive impact on the increase in liquidity. Significant impact is found between leverage and profitability, so

an increase in indebtedness rates will have the effect of diminishing economic profitability.

In the continuation of the study, we determine the influence of the independent variables on the bearing fund, using multiple regression. The synthesis of the results obtained by applying the regression model, meant to identify the interdependence between the independent and the dependent variables, is presented in table no. 7.

Table 7: Correlation between the parameter estimates, based on the score associated with the main components

Dependent Variable: FR
Method: Panel Least Squares
Sample: 2007 2017
Periods included: 11
Cross-sections included: 26
Total panel (balanced) observations: 286

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.5646	0.3436	33.654	0.0050
Solvency and leverage	-0.9313	0.3504	0.2605	0.0947
Liquidity	5.6881	0.3432	162.24	0.0000
Profitability	0.7677	0.3481	2.2049	0.0286
Operational factor	-1.2114	0.4424	4.9985	0.0013

R-squared	0.9322	Mean dependent var	11.564
Adjusted R-squared	0.9221	S.D. dependent var	56.142
S.E. of regression	4.9796	Akaike info criterion	6.0721
Sum squared resid	5083.4	Schwarz criterion	6.1518
Log likelihood	-632.57	Hannan-Quinn criter.	6.1043
F-statistic	6590.2	Durbin-Watson stat	1.9871
Prob(F-statistic)	0.0000		

Source: authors' processing in the E-Views 9 statistical program

The turnover of the working capital in the research companies is influenced by 93.22% of solvency and indebtedness, liquidity, profitability and operational factor. The regression equation is accepted, as there was no significant difference between the determinant and the adjusted coefficient.

The results of the significance test F show that at the level of the equation as a whole, the null hypothesis is rejected because the value obtained by the Significance F> a (0,00) is less than the significance threshold chosen (0,05). The Durbin-Watson Statistical Test indicates a strongly positive serial correlation of residues, having a value of 1,987 compared to the value of 2 considered optimal.

The equation of the working capital, determined by the factors extracted is:

FR_i = 11,56 - 0,93 * Solvency and leverage + 5,68 * Liquidity Equation (5)
+ 5,68 * Profitability - 1,21 * Operational factor

It is noted that the variation of the working capital in the companies belonging to the hotel industry and restaurants listed on the Bucharest Stock Exchange is negatively influenced by the indebtedness and the operational factors, respectively positive by the liquidity and profitability indicators.

5. Conclusions

The study identified the factors with significant influence on the variation of the working capital and the financial equilibrium at the level of the hotel industry and restaurants listed on the Bucharest Stock Exchange. Applying the factorial analysis on 12 financial indicators to companies from the hotel industry and restaurants listed on the Bucharest Stock Exchange during 2007-2017, led us to identify four factors, the cumulative percentage change of which is almost 65% of the total change in the working capital.

According to the estimated multivariate regression model, the change in the working capital is explained by 93.22% of the factors resulting from the analysis of the main components, solvency and indebtedness, the liquidity factor, the profitability and the operational factor. Thus, an increase in liquidity and profitability will result in an increase in the working capital, which will lead to ensuring and maintaining the financial balance. On the other hand, an increase in financial leverage, debt recovery and inventory conversion will entail a reduction in the working capital, with a negative effect on the financial equilibrium situation at the hospitality industry and restaurants listed on the Bucharest Stock Exchange.

6. References

- Achim Monica-Violeta, Pop Fănuţa, Achim Sorin (2008), The analysis of financial equilibrium in the context of account globalization, pp.225-236;
- Anupam De, Gautam Bandyopadhyay, B.N. Chakraborty (2011), Application of the Factor Analysis on the Financial Ratios and Validation of the Results by the Cluster Analysis: An Empirical Study on the Indian Cement Industry, Journal of Business Studies Quarterly, Vol. 2, No. 3, ISSN 2152-1034, pp.13-31;
- Arunkumar O.N., T. Radharamanan (2013), Variables Affecting Working Capital Management of Indian Manufacturing Firms: Factor Analysis Approach, International Journal of Financial Management, Volume 3 Issue 2 April 2013, pp.10-16;
- Balteş, Nicolae, Ciuhureanu, Alina-Teodora (2013), Consideraţii privind analiza echilibrului financiar al întreprinderii, Conferinţa Ştiinţifică Internaţională, Contabilitatea și auditul în contextul integrării economice europene: progrese şi aşteptări, 5 aprilie, 2013, Chişinău, pp.217-220;
- Egbide, B. (2009), Working Capital Management andProfitability of ListedCompanies in Nigeria, Nigerian Research Journal of Accountancy (NRJA), 1/1, pp.44-53;
- Hair et al. (2006), citat în García Jara, E., Cuadrado Ebrero, A., Elsava Zapata, R. (2011), Effect of international financial reporting standards on financial information quality, Journal of Financial Reporting & Accounting, 9 (2), pp.182-195;
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009), Multivariate data analysis, Upper Saddle River, Prentice-Hall;
- Harman, H.H. (1976), Modern factor analysis (3rd ed. revised), Chicago, IL: University of Chicago Press;
- Kaiser, H.F (1974), An index of factor simplicity, Psychometrika Vol. 39, pp. 31-36;
- Miron, V.C.I. (2015), Financial position and its relevance to stakeholders, Annals of the „Constantin Brâncuşi" University of Târgu Jiu, Economy Series, Issue 2/2015, pp.356-365;

- Pociovalisteanu, D., M., et. al., (2010), Aggregate Dimensions Used In Carrying Out The Financial Balance Of The Economic Entity In Financial Vision, The Annals of the "Stefan cel Mare" University of Suceava. Fascicle of The Faculty of Economics and Public Administration, Volume 10, Issue 1, pp. 125-134;
- The Pennsylvania State University, Applied Multivariate Statistical AnalysisSTAT 505, Penn State Eberly College of Science, https://onlinecourses.science.psu.edu/stat505/node/75.