

THE CORELLATION RISK – RETURN ON EMERGENT MARKETS: THE ROMANIAN CASE

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Abstract: : Risk is an important factor in explaining capital structure choices of companies. This paper proposes a framework where we realized a study case: in this study we test if return on assets and return on equity has influence on the risk, both on long and short term. For this purposes, we conduct an empirical research that covers 33 selected companies traded at the Bucharest Stock Exchange within the time period 2005-2009. For the study our results reveal that dynamic global risk can be associated to a low intensity with total assets performance of the company's. Investments efficiency and the adoption of certain financial positions appear to be key factors in the dynamics of, while total asset performance is weak associated with the dynamics of global risk.

JEL classification: M21, G30

Key words: risk; return on equity; GMM System estimator; return on assets; activity sector

1. INTRODUCTION

A fundamental idea in finance is the relationship between risk and return. The greater the amount of risk that an investor is willing to take on, the greater the potential return. The reason for this is that investors need to be compensated for taking on additional risk. Why put capital at significant risk for a return that is no higher than the return on government bonds? Or expect higher than averages returns from low-risk activities? It is impossible to separate measuring the performance of a company from the risks that the management takes to achieve it.

In most aspects of company operations, risk assessment plays a different but equally important, role. It is an integral part of informed decision taking in achieving performance. Risk assessment is involved from the highest level in strategic choices about what activities to undertake, what assets to buy or what markets to serve all the way to detailed operational decisions about whether to accept payment in foreign currencies and the adequacy of safety measures in the workplace. It plays a part

whether or not an organization is aware of managing risk and many managers feel that their instinct and judgment are enough – a behavior risk. The danger is that this leaves company risk unplanned and unmanaged.

The challenge of safeguarding financial stability has become even more vital in recent years in light of the new global financial environment that has rapidly evolved, characterized by enhanced financial liberalization and integration, rapid development of new financial products and technologies, as well as increasing competition. All of the above pose additional pressure on companies to effectively manage their risk, while ensuring a high level of efficiency.

There are several studies that have tried to investigate the appealing relationship between efficiency and risk. Most researchers have focused on the relationship between efficiency and credit risk, usually proxied by problem loans or loan loss provisions. A related strand of the literature has examined the relationship between risk and efficiency by incorporating in the efficient frontier various aspects of risk. Finally, another strand of the literature has investigated the relationship between efficiency and bank failure and found that failing banks tend to locate far from the efficiency frontier.

Despite the apparent interest in investigating the relationship between efficiency and risk, no empirical study has, so far, provided comprehensive evidence on the causality between them. On theoretical grounds, Goodhart et al. (2004) argue that financial stability is endogenously determined together with economic efficiency within a general equilibrium model, whilst they point to the existence of a trade-off between them. This could indicate a possible negative relationship between efficiency and risk. On the other hand, other studies argue that such a trade-off may not exist.

2. OBJECTIVES

The paper seek to cover a gap in the empirical literature by testing the relevance of the issuer's financial ratios architecture as described by some key financial ratios for their market value and performance and for an emergent capital market, such as the Romanian one. Indeed, there are still a limited number of studies dealing with such topic on Central and Eastern European countries. Thus, one can argue that the specific institutional, structural and functional features of these markets are determining particular investor's reactions and financial assets price mechanisms. So, that we are trying to highlight some of these particularities as well as their implications for portfolio's management in the context of global financial turmoil.

3. METHODOLOGY

To illustrate the connection between the rates that reflect the companies' financial performance, namely the return on assets and the return on equity and a measure of the existing overall risk in the companies, measured by changes in net profit, we considered 33 companies in category I and II listed on the Bucharest Stock Exchange, cases synthesized by the following indicators:

- net profit;
- return on assets – ROA (Net income/Total Assets);
- return on equity – ROE (Net income/Shareholders equity) .

The data are grouped into two sectors conventionally defined to allow noticing the features that the branch / industry sector induce in the "optimal" levels of the rates. The two sectors are grouped as follows:

- Sector 1 - light industry - includes: Chemical Industry, Drugs and Medical Products, Telecommunications, Plastics, Tourism and Hotel Services;
- Sector 2 - heavy industry - includes: Oil Industry - including services related to extraction and processing, Mechanical Engineering, Metallurgical / Steel Industry, Civil and Industrial Constructions, Materials Processing Industry.

The System GMM methodology proposed by Arellano and Bover (1995), Blundell and Bond (1998, 2000) and Windmeijer (2005) is concerned because estimators such as fixed and random effects, IV or the standard GMM could lead to biased results. Also, since a small sample of panel data can produce a “downward inclination of the estimated asymptotic standard errors” in the two-step procedure (Baltagi, 2008: 154), we will use the “Windmeijer correction” for the estimated standard errors.

There are several advantages of GMM - System compared with other static or dynamic methods of estimation of panel data. In the database we have 33 companies (N) divided into two sectors analyzed over a period of 5 years (T). The literature establishes several reasons for using dynamic panel model because it is designed for a situation where “T” is less than “N” in order to control the dynamic panel (Bond, 2002; Baltagi, 2008); the potential endogeneity problem can be easily addressed in the dynamic panel models than in the static and in the LSM (Least-Squares Method) models because all the regression variables that are not correlated with the error term (including the lag and differential variables) can potentially be used as valid instrumental variables; the dynamic panel model is able to identify the implied short- and long-term effects (Baltagi, 2008); the GMM system exploits the stationarity restrictions, while the first differencing GMM estimator can behave poorly when the time series are persistent; if the panel data are unbalanced, then the first-difference GMM methodology may amplify the differences between them (Roodman, 2007) and so on.

The purpose of this study is to test the following meta-hypothesis:

H: the return on assets and return on equity influences the company risk change for both long and short periods of time.

The implicit formal model of H can be formulated as follows:

$$R_{i,t} = \alpha_i + \omega_t + \rho * R_{i,t-1} + \beta * Re_{i,t} + \theta * Rf_{i,t} + \varphi * Z_{i,t} + \varepsilon_{i,t}$$

Where $R_{i,t}$ is the risk level of a sector calculated in our study by the net profit, $Re_{i,t}$ is the return on assets, $Rf_{i,t}$ is the return on equity, α_i represents the specific time invariant unobserved effects, ω_t captures a common deterministic trend, Z is a set of tools for R and Re and $\varepsilon_{i,t}$ is a random disturbance considered to be normal and identically distributed (IID) with $E(\varepsilon_{i,t})=0$; $Var(\varepsilon_{i,t}) = \sigma^2 > 0$.

4. ANALYSES

To illustrate the connection between the rates that reflect the companies' financial performance, namely the return on assets and the return on equity, and a

measure of the existing overall risk in the companies, measured by changes in profit, we considered the 33 companies in category I and II listed on the Bucharest Stock Exchange, divided in two sectors conventionally defined.

Data processing was carried out in DPD (Dynamic Panel Data), a program that facilitates the estimation of the dynamic panel data models.

The estimation strategy carries the running of a separate regression for highlighting the existing connections between each of the estimation ways of the overall risk and rates of return for each sector.

An additional step in the advanced analysis is the development of regressions in panel data in order to estimate the intensity of the connections that can be outlined between the various forms of estimation of the dynamic in the outcome indicator changes (as a measure of the overall risk as shown in the company) and economic and financial rates of return.

The data are grouped as follows:

- at the level of the entire set of observations by grouping all the companies within each sector in a single set;
- at the level of each sector, considered separately.

The implementation of the estimation strategy involves:

- the obtaining of the regression parameters;
- the estimation of the intensity of the links between endogenous and exogenous variables in terms of Student t-test (an empirical value of this test greater than 2 reflects a significant connection; the higher this value is so can be presumed the fact that the bond strength is more pronounced);
- the estimation of the instrumental variables accuracy in terms of SARGAN test (an empirical value of this test as close to 1 percentage point reflects a correct estimation of the residual variables).

a1. The connection between the net profit and ROA and ROE -sector 1

Dependent variable: net profit

Method: Dynamic Panel Generalized Method of Moments (GMM – System)

Transformation: first-order difference (orthogonal deviations)

Total comments included (unbalanced panel): 84

Variable	Coefficient	Standard Error	t-stat	Prob.
ROE	1,494	2,68	0,557	0,579
ROA	-352329	7,52	-0,0468	0,963
Sargan Test	11,32 [0,333]			

According to these results, both types of return have a low explanatory power to predict changes in net profit in sector 1 as a measure of the overall risk.

On the basis of the Sargan test one can assess the relevance of the selected model in terms of the chosen instrumental variables accuracy.

In order to avoid some multicollinearity problems that can be induced by the structural connections between the financial indicators considered, we will perform separate regressions for each explanatory variable.

a2. The connection between the net profit and ROA - sector 1

Dependent variable: net profit

Method: Dynamic Panel Generalized Method of Moments (GMM - System)

Transformation: first-order difference (orthogonal deviations)

Total comments included (unbalanced panel): 84

Variable	Coefficient	Standard Error	t-stat	Prob.
ROA	3,38	2,37	1,43	0,157
Sargan Test	8,860			[0,263]

According to the results obtained in this regression with one independent variable, namely ROA, we can say that, based on its modification, one can forecast the profit variation as a measure of the overall risk evolved in sector 1. The value of t-statistic indicates a quite poor intensity of the relationship between the two variables, the net profit and ROA and the value of 26.3% of Sargan test involves little relevance of the model chosen in terms of the instrumental variable accuracy decided on.

Hereinafter, we will create a regression with ROE as the independent variable.

a3. The connection between the net profit and ROE - sector 1

Dependent variable: net profit

Method: Dynamic Panel Generalized Method of Moments (GMM - System)

Transformation: first-order difference (orthogonal deviations)

Total comments included (balanced panel): 85

Variable	Coefficient	Standard Error	t-stat	Prob.
ROE	2,26	1,32	0,172	0,864
Sargan Test	6,747			[0,456]

According to the results obtained in this regression with one independent variable, namely ROE, we can say that based on its change one cannot predict the change in profit as a measure of the expressed overall risk in sector 1. T-statistic value is low, which indicates a low intensity of the relationship between the two variables and the value of 45.6% of Sargan test involves little relevance of the model chosen in terms of the instrumental variable accuracy decided on.

a4. The connection between the net profit and ROA and ROE -sector 2

Dependent Variable: Net Profit

Method: Dynamic Panel Generalized Method of Moments (GMM - System)

Transformation: first-order difference (orthogonal deviations)

Total comments included (balanced panel): 80

Variable	Coefficient	Standard Error	t-stat	Prob.
ROA	-1,42	9,14	-1,56	0,122
ROE	1,27	3,30	3,86	0,000
Sargan Test	12,30			[0,266]

The variable most closely interrelated with the net profit for sector 2 is ROE (t-statistic value greater than 2). Between the net profit and ROE there is a direct

proportional relationship of high intensity. Unlike the return on equity, the return on assets has a lower impact and statistical significance. Based on the Sargan test result it can be stated that the chosen model was correct in terms of the instrumental variables considered.

Like in sector 1, in order to avoid the multicollinearity problems that can be induced by the structural connections between the financial indicators considered, we will create separate regressions for each explanatory variable.

a5. The connection between the net profit and ROA - sector 2

Dependent Variable: Net Profit

Method: Dynamic Panel Generalized Method of Moments (GMM - System)

Transformation: first-order difference (orthogonal deviations)

Total comments included (balanced panel): 80

Variable	Coefficient	Standard Error	t-stat	Prob.
ROA	1,09	8,78	1,25	0,216
Sargan Test	7,171 [0,411]			

According to the results obtained, it is noted that based on the ROA modification the profit variation as a measure of the evolved overall risk in sector 2 can be estimated with scepticism. The value of t-statistic is low, which indicates a low intensity of the relationship between the two variables, although the value of 41.1% of Sargan test implies the relevance of the chosen model in terms of the instrumental variable accuracy decided on.

Hereinafter, we will create a regression with the ROE as an independent variable.

a6. The connection between the net profit and the ROE - sector 2

Dependent Variable: Net Profit

Method: Dynamic Panel Generalized Method of Moments (GMM - System)

Transformation: first-order difference (orthogonal deviations)

Total comments included (balanced panel): 80

Variable	Coefficient	Standard Error	t-stat	Prob.
ROE	9,77	3,77	2,59	0,011
Sargan Test	9,398 [0,225]			

According to the results obtained, the ROE can be considered the main explanatory variable associated with a change in net profit with a strong explanatory power. Between the net profit and the return on equity there is a direct proportional relationship, the Sargan test establishing the relevance of the selected model in terms of the instrumental variable accuracy.

5. CONCLUSIONS

Based on the results in the two sectors with the net profit as a dependent variable we can conclude:

Sector 1:

- when considered the net profit as a dependent variable and the return on assets and the return on equity as instrumental variables, one can notice a low explanatory power of both of them;
- considering the regression with the return on assets as an instrumental variable one can establish a poor connection between the net profit and the return on assets, the model statistical relevance being reduced;
- the obtained regression with the return on equity as instrumental variable shows a very low intensity between the two variables, the net profit and the return on equity;

Sector 2:

- having the return on assets and the return on equity as instrumental variables we can state that the most closely interrelated variable with the net profit for sector 2 is the return on equity (t-statistic value greater than 2). Between the net profit and the return on equity there is a direct proportional relationship of high intensity.
- unlike the return on equity, the return on assets has a lower impact and statistical significance. Based on the Sargan test result it can be stated that the chosen model was correct in terms of the instrumental variables considered.
- considering the regression with the return on assets as an instrumental variable one can establish a very poor connection between the net profit and the return on assets, the statistical relevance of the model being reduced;
- the obtained regression with the return on equity as an instrumental variable indicates that based on its change one can forecast the profit variation as a measure of the overall risk expressed in sector 2. The value of t-statistic is high, indicating a strong intensity of the relationship between the two variables, the net profit and the return on equity and the value of the Sargan test involves the relevance of the selected model in terms of the instrumental variable accuracy decided on.

For sector 1, the global risk dynamics can be associated with a low intensity with the total asset performance of the companies in the sector.

For sector 2, the investments efficiency and the adoption of certain financial positions appear to be the key factors in the dynamics of sectoral risk, while the total assets performance is quite poorly associated with the overall risk dynamics.

It can also be noted that between the two sectors, even in the conventional manner in which they were defined, there are important differences in the intensity and in the relative importance of the links established between the risk dynamics and the economic and financial rates of return.

These differences can be explained by both environmental uneven factors characteristics to companies activities and the distinct perception that the companies have regarding sector specific risks.

The objective of this study is to demonstrate a series of empirical issues that support the thesis according to which, even on a short term, in order to identify the changes in risk at sector level shows the relevant companies performance, measured within the study based on the economic and financial rates of return.

Of course there are clear limitations of the analysis, namely:

- limited number of financial ratios considered;
- analyzed data heterogeneous structure;
- the analyzed time interval (2005 - 2009);
- possible errors induced by the non-linear interactions between the variables considered.

Despite these limitations of the proposed analysis, the existence of some mechanisms can be revealed based on this analysis, through which the instrumental variables described by the economic and financial rates of return may affect the manifestation of the risk at sector level.

The main directions of future research would be limited to:

- the integration in the analysis of a wider set of variables in the performance rates;
- the development of some conceptual explanations of the effects of the companies performance level on risk manifestation at sector level.

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