SECTORAL RISK AND RETURN FOR COMPANIES IN ROMANIA

Lala – Popa Ion
West UniversityTimişoara Faculty of Economics and Business Administration

Buglea Alexandru
West UniversityTimişoara Faculty of Economics and Business Administration

Aniş Cecilia-Nicoleta
West UniversityTimişoara Faculty of Economics and Business Administration

Cicn Simona
West UniversityTimişoara Faculty of Economics and Business Administration

Risk is an important factor in explaining capital structure choices of companies.Risk is the probability that cash flows or return will vary from expectations. Standard corporate finance theory supposes that a company chooses a capital structure that maximizes company value. 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. This paper proposes a framework where we realized a study cases: 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 59 selected companies traded at the Bucharest Stock Exchange within the time period 1999-2010. For this 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 risk.

1. Introduction

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 59 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.

2. Methodological framework
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 59 companies (N) divided into two sectors analyzed over a period of 12 years :1999 – 2010 (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.
Consequently, we will use the system GMM estimator trying to compensate for these specific problems in a small sample of data.
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:
$$R_{i,t} = \propto_i + \omega_t + \rho * R_{i,t-1} + \beta * Re_{i,t} + \theta * Rf_{i,t} + \varphi * Z_{i,t} + \varepsilon_{i,t}$$
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, $\propto_i$ represents the specific time invariant
unobserved effects, $\omega_t I$ 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 $E(\varepsilon_{i,t})=0$; $Var(\varepsilon_{i,t}) = \sigma^2 > 0$.

3. Risk - Return Correlation estimated by applying the GMM System
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 59 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:

- 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 (balanced panel): 384

Variable	Coefficient	Standard Error	t-statistic	Probability
Return on assets	0.83	0.09	8.65	0.299
Return on equity	0.009	0.009	1.04	0,428
Sargan Test	31.59 [1.000]			

According to these results, return on assets has an explanatory power in forecasting the net margin rate at the level of sector 1. Based on the value of the Sargan test, one can assess the model relevance chosen through the correctness of the chosen instrumental variables.

In order to avoid some multicollinearity problems that can be induced by the structural connections between financial indicators considered, we will conduct 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 (balanced panel): 384

Variable	Coefficient	Standard Error	t-statistic	Probability
Return on assets	0.71	0.07	9.11	0.000
Sargan Test	31.08 [0.912]			

According to the results obtained within this regression with a single independent variable, namely return on assets, we can state that, based on this change we can forecast the net profit as a measure of the overall risk at the level of sector 1. The value of the t-statistic indicates a strong intensity of the link between the two variables, the net profit and return on assets, and the value of the Sargan test involves a high relevance of the model chosen in terms of accuracy of the chosen instrumental 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): 384

Variable	Coefficient	Standard Error	t-statistic	Probability
Return on equity	0.05	0.02	2.37	0.018
Sargan Test	31.63 [0.900]			

The regression obtained with return on equity as the single independent variable indicates a direct proportional link between the net profit and return on equity, the first one having a weaker power of prediction for this sector than the return on assets.

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): 372

Variable	Coefficient	Standard Error	t-statistic	Probability
Return on assets	0.96	0.15	6.26	0.000
Return on equity	0.0008	0.001	0.56	0.57
Sargan Test	26.69 [1.000]			

Similar to sector 1, considering the net profit as an independent variable and a measure of the risk and return on assets and return on equity as dependent variables, only the economic one has the ability to forecast changes in the estimated risk based on the net profit.

In order to avoid some multicollinearity problems that can be induced by the structural connections between the financial indicators considered, we will conduct 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): 372

Variable	Coefficient	Standard Error	t-statistic	Probability
Return on assets	0.85	0.1	7.76	0.000
Sargan Test	29.56 [1.000]			

This regression being obtained confirms the previous estimates, namely that there is a strong direct proportional link between return on assets as an instrumental variable and net profit. The Sargan test indicates a high level of model relevance from the considered instrumental variable perspective.

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): 372

Variable	Coefficient	Standard Error	t-statistic	Probability
Return on equity	0.008	0.003	2.27	0.024
Sargan Test	30.99[1.000]			

Considering the return on equity as a unique instrumental variable within the regression formed which has the net profit as a dependent variable, one may though identify even here a direct proportional link between the two variables, which confirms the possibility of errors emergence because of the multicollinearity induced by the structural connections between the financial indicators considered.

4. Conclusions

Analyzing the econometric model built, having the net profit as the risk measure and return on assets and return on equity as independent variables, it is advisable, using this measure to estimate the risk, to take into account return on assets both for Light Industry and Heavy Industry. Within this model, the return on equity is not the most appropriate risk calculator, imposing either the use of the model having the return on assets as a single independent variable or reconsidering the model by introducing other financial or non-financial performance indicators as independent variables.

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 and 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 reveal 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.

theWest University of Timisoara in partnership with the University of Craiova and Fraunhofer Institute for Integrated Systems and Device Technology - Fraunhofer IISB.

References

1. 1. Buglea, A. & Lala, I. (2009), Analiză economico-financiară, Ed. Mirton, Timişoara;
2. 2. Copeland, T. E. & Weston, J. F. (1986) Financial Theory and Corporate Policy, Wokingham: Addison-Wesley;
3. 3. Cristea, H., Pirtea, M., Boţoc, C. & Nicolescu, Cristina (2010), Managementul financiar al companiei, Editura Mirton, Timişoara;
4. 4. Dagpunar, J., S.(2007), Simulation and Monte Carlo, Ed. John Wiley & Sons;
5. 5. De Jong, A. (2001), The disciplining role of leverage in Dutch Firms, Tilburg University;
6. 6. Dowd, K. (2005), Measuring Market Risk, John Wiley & Sons, 2nd Edition;
7. 7. Dragotă, V., Ciobanu, Anamaria, Obreja, Laura & Dragotă, Mihaela (2003), Management financiar, vol. I, Ed. Economică, Bucureşti;
8. 8. Fama, E.F. & Jensen, M.C. (1983), Separation of ownership and control, Journal of Law and Economics, nr.26;
9. 9. Greuning, H. & Bratanovic, J. (2004). Analyzing and Managing Banking Risk, A Framework for Assessing Corporate Governance and Financial Risk, Editura Irecson, Bucureşti;
10. 10. Ivan, T. D. (2008), Monte Carlo Methods for Applied Scientists, Ed. World Scientific Publishing, Bulgaria;
11. 11. Kalos, M. H. & Withlock, Paula, A. (2008), Monte Carlo Methods, Ed. Willey – Blackwell, Germania;
12. 12. Korn, R. & Korn, Elke & Kroisandt, G.(2010), Monte Carlo Methods and Models in Finance and Insurance, Editura CRC, New York, SUA;
13. 13. Penza, P.& Bansal,V. (2000), Measuring Market Risk with Value at Risk, John Wiley & Sons
14. 14. Roman, S. (2005), Introduction to the Mathematics of Finance, Springer-Verlag;