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Macroeconomic Impact on CEE Corporate Profitability: Analysis at the Level of Companies Listed on the Bucharest Stock Exchange

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Abstract. *This paper aims at identifying a potential impact of the macroeconomic environment on the profitability of the companies listed on the Bucharest Stock Exchange. This research derives from the most recent literature on the macroeconomic determination of the capital structure of companies located into emerging countries. Indeed, as for these corporations, there has been agreed on the risk transfer between sovereign and corporate spreads, but every emerging country incurs a particular approach and generalization tends to decay. Therefore, the research focuses on highlighting out the macro-determination of the corporate profitability; there will be developed a complex perspective, following up the mixture between idiosyncratic and systemic approach.*

Keywords: default risk, macroeconomic impact, profitability, idiosyncratic.

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1. Introduction

Global economy triggered corporate sector internalization. Companies became more and more integrated into a borderless world, designing and implementing strategies in order to reduce costs through economy of scale and outsourcing.

Meanwhile, corporations are more and more exposed to disequilibriums originating from the international environment. Macroeconomic volatility impacts them more consistently, especially from the perspective of their creditworthiness and profitability.

Economic cycle is closely related to corporate profitability. During boom periods, profitability potential increases while recession brings it down. An economic downturn triggers the probability to not be able to generate enough cash-flow in order to cover the financial obligations.

During the last decade, analysts agreed on the fact that corporate default does not imply only an idiosyncratic side, but also a systemic one, resulting from the correlation of the company with the macroeconomic environment.

This paper aims at highlighting out the impact of the macroeconomic environment on the profitability of the companies listed on the Bucharest Stock Exchange, broken down by sector. There have been selected three variables closely linked to the macroeconomic volatility – current account deficit, economic growth, exchange rate fluctuation – that have been integrated into an OLS regression grouping also indicators reflecting the financial soundness of the company. The conclusions regarding the potential impact of the macro side on the profitability tend to differ according to the corporate sector, some being more impacted than the others.

This research is divided as follows**:** section two includes a literature review and section three is dedicated to the case-study and to the conclusions.

Section 2

Recently there has been developed a consistent literature on the macro determination of the corporate default (see Mc Neil, Frey, Embrachts, 2005). Links between micro and macro-variables closely related to corporate default have been pointed out. Alves (2005) and Shahnazarian and Asberg-Sommer (2007) found cointegration relationships between the macro and Moody s KMV expected default frequency (EDF) variables. Short-term interests, GDP and inflation are closely linked to EDF. Similar approaches have been developed by Aspachs, Goodhart, Tsomocos and Zicchino (2006) as well as by Pesaran, Schuermann and Weiner (2006). These perspectives subscribe to an impact

derived from the macro-environment to the corporate segment, while Pesaran, Schuermann and Weiner (2006) revealed that this relationship can be modeled also under the form of an impact deriving from the corporate to the macro side. They found out that corporate default probability as well as equity values impact GDP variables.

Castren et al. (2007) included domestic output, inflation, nominal interest rate and real exchange rate as endogenous variables into a VAR model, while aggregated default frequency and foreign macro variables were incorporated as exogenous variables. They concluded that default frequency and macro indicators have a similar trend.

This paper follows up the rationale of Jacobson et al. (2005), who conceived macro variables as corporate default regressors using the logit methodology. What it differentiates this approach is precisely the fact that there will be developed an OLS regression at the level of the corporate profitability which is conceived as the key element of the corporate financial soundness. There have been selected three variables closely linked to the macroeconomic volatility – current account deficit, economic growth, exchange rate fluctuation – that have been integrated into an OLS regression grouping also indicators reflecting the financial soundness of the company.

The research aims at revealing to what extent profitability is triggered by variables at the firm level and by variables related to the macro-environment. The conclusions regarding the potential impact of the macro-side on the profitability tend to differ according to the corporate sector, some being more impacted than the others.

Section 3

In order to reveal the macroeconomic impact on corporate profitability, there has been performed a regression integrating profitability reflected into the net margin as endogenous variable and a series of financial ratios related to liquidity, size and solvency as exogenous variables. Regressors included also macroeconomic variables – current account deficit, exchange rate volatility and real economic growth.

Database integrated financial information related to the companies listed on the Bucharest Stock Exchange, broken down by sector. The industries analysis focused on were represented by materials, finished goods producers, fertilizer producers, energy and pharmaceuticals. The period financial information was related to was represented by the interval 1997-2007.

In a first stage, regression included only firms related variables, linked to the idiosyncratic side of the corporate profitability.

We estimated the following equation:

$P_t = \alpha + \beta \times X_{it} + \varepsilon_t$

Where:

P_t = Profitability indicator

X_{it} = Idiosyncratic indicators (firm-level related)

E_t = Error term.

Secondly, regression was enlarged by the macro-related indicators. The key element originates from the way statistic output evolved from one regression to another, especially from the perspective of the macro-indicators impact.

We estimated the below equation:

$P_t = \alpha + \beta \times X_{it} + \gamma \times Y_{it} + \varepsilon_t$

Where:

P_t = Profitability indicator

X_{it} = Idiosyncratic indicators (firm-level related)

Y_{it} = Macro-related indicators

ε_t = Error term.

Table 1

Statistic output of the regression integrating both firm related and macro-variables

Industry		Indicators	Coefficient	T-statistic and associated standard error	p-value	R-squared	Adjusted R-squared
finished goods producers	liquidity and asset management indicators	current assets turnover	-3.553	0.8402 (0.06)	0,008	0.767097	0.638069
		current liquidity	3.553	0.4071 (0.04)	0,005		
	solvency and indebtedness indicators	Debt to EBITDA	-0,06	0,571 (0,0109)	0,007		
		Debt to Total Assets	0,077	0,35 (0,02)	0,006		
		Debt service ratio	0,33	0,236 (0,008)	0,007		
		FFO to Debt	3,61	0,6064 (0,006)	0,008		
	size indicator	Logsales	1,48	0,108 (0,013)	0,009		
chemicals	liquidity and asset management indicators	Current assets turnover	26,48	21,3 (1,24)	0,002		
		Current liquidity	-90,6478	465,718 (-0,1947)	0,008		
	solvency and indebtedness indicators	Debt to EBITDA	-0.322825	0.303902 (-1.062)	0.032		
		Debt to Total Assets	-120.2946	81.75815 (-1.473)	0.018		
		Debt service ratio	-61.18261	70.03182 (0.873640)	0.0413		
		FFO to Debt	-3.209713	3.676670 (-872995)	0.0416		
	size indicators	Logsales	2904.822	1330.631 (2.183042)	0.044		
	macro Related variables	Current account deficit	0.006150	0.001344 (0.4575902)	0.0446		
		Exchange rate volatility	0.879767	2.344224 (0.375291)	0.7435 (0.0073)		
		Real economic growth	0.760596	1.024974 (-0.7420)	0.0354	0.806623	0.71297

Industry		Indicators	Coefficient	T-statistic and associated standard error	p-value	R-squared	Adjusted R-squared
energetics	liquidity and asset management indicators	Current assets turnover	-1.490746	1.881753 (-0.7922)	0.0464	0.77458	0.72345
		Current liquidity	0.016158	0.038759 (0.004168)	0.004168		
	solvency and indebtedness indicators	Debt to EBITDA	-0.000307	0.000275 (-1.1153)	0.03154		
		Debt to Total Assets	-0.214905	0.124874 (-1.7202)	0.01459		
		Debt service ratio	0.234120	1.321903 (0.177108)	0.0243		
		FFO to Debt	0.009080	1.162735 (0.007809)	0.0297		
	size indicator	Logsales	0.000391	0.616623 (0.000633)	0.05645		
	macro Related variables	Current account deficit	1.643851	0.501164 (-3.280)	0.00817	0.87231	0.7956
		Exchange rate volatility	0.876774	0.258170 (-3.3961)	(-3.3961) 0.00768		
		Real economic growth	0.039107	0.010669 (-3.6653)	0.00670		
fertilizers	liquidity and asset management indicators	Current assets turnover	7.430916	13.03398 (0.570119)	0.04701	0.64701	0.59432
		Current liquidity	-23.51600	22.35679 (-1.051850)	0.04839		
	solvency and indebtedness indicators	Debt to EBITDA	0.000898	1.126925 (0.000797)	0.04621		
		Debt to Total Assets	-0.423763	0.539513 (-0.785456)	0.04761		
		Debt service ratio	0.017591	0.812734 (0.021644)	0.05655		
		LTD to equity	0.002415	0.121980 (0.019801)	0.0227		

Industry		Indicators	Coefficient	T-statistic and associated standard error	p-value	R-squared	Adjusted R-squared
	size indicator	Logsales	-24.22621	39.28289 (-0.616712)	0.0482		
	macro related variables	Current account deficit	-0.022339	0.016869 (-1.324308)	0.04117	0.7123	0.7067
		Exchange rate volatility	Unsignificant statistic output				
		Real economic growth	1.521871	1.171911 (1.298623)	0.04178		
materials	liquidity and asset management indicators	Current assets turnover	0.016579	6.763591 (0.002451)	0.04981	0.564	0.5323
		Current liquidity	-4.510994	25.87582 (-0.174332)	0.03659		
	solvency and indebtedness indicators	Debt to EBITDA	-0.000501	0.002364 (-0.211985)	0.0374		
		Debt to Total Assets	-0.141689	0.350452 (-0.404304)	0.0 366		
		Debt service ratio	-0.088327	0.189450 (-0.466228)	0.03535		
		FFO to Debt	0.018331	1.582057 (0.011587)	0.01523		
	size indicator	Logsales	4.66	3.03 (0.153682)	0.0317		
	macro related variables	Current account deficit	-0.007373	0.006641 (-1.110239	0.02991	0.77454	0.67454
		Exchange rate volatility	0.559198	0.926404 (0.603622)	0.05628		
		Real economic growth	0.241970	0.599233 (0.403800)	0.03656		
pharmaceuticals	liquidity and asset management indicators	Current assets turnover	25.04699	8.384082 (2.987446	0.0205	0.7205	0.7037
		Current liquidity	-0.012241	0.009220 (-1.327647)	0.04110		

Industry		Indicators	Coefficient	T-statistic and associated standard error	p-value	R-squared	Adjusted R-squared
	solvency and indebtedness indicators	Debt to EBITDA	0.048321	1.822146 (0.026519)	0.03195		
		Debt to Total Assets	-1.365747	0.500134 (-2.730764)	0.0235		
		Debt service ratio	0.059265	0.339126 (0.174757)	0.019		
		FFO to Debt	-0.006187	0.003731 (-1.658276)	0.0455		
	size indicator	Logsales	Unsignificant statistic output				
	macro Related variables	Current account deficit	-0.318399	0.068292 (-4.662325)	0.01345	0.7743	0.7534
		Real economic growth	0.000416	0.529137 (0.000786)	0.529137	0.0256	
		Exchange rate volatility	-0.59198	0.754404 (0.603622)	0.03628		

Statistic output points out that profitability is impacted to a high extent by solvency, liquidity and size indicators. Material and chemical industry profitability is correlated negatively with liquidity while the other industries seem to be positively correlated. This conclusion is quite interesting. A good liquidity indicator impacts in a positive way profitability. Profit creates good opportunities in order to bring liquidity into the company, but it does not necessarily imply liquidities in the realistic sense which is in line with the case of material and chemical industries.

Size is correlated positively with profitability while solvency and indebtedness indicators are correlated in most of the cases negatively.

Enlarging the regressions by the macro-variables creates a clear opportunity for the R-squared and adjusted R-squared to increase. In all the cases, R-squared and Adjusted R-squared increase at least by 10%. The most significant change is recorded in the case of the pharmaceutical industry (R-squared increases from 0.55 to 0.78).

Profitability is highly impacted by the macroeconomic indicators at the level of 4 out of the 5 industries. The only industry which is not impacted by macro environment is represented by the finished goods industry. Its profitability is impacted only at the firm level. Current account deficit impacts negatively profitability at the level of the material, fertilizers producers and pharmaceutical industries while chemical and energetics industries are impacted positively. This impact is explained by the correlation of the industry with the final consumption. Energetics and chemicals are strongly linked to the usual consumption supported by a high current account deficit while the other industries are not linked to the same extent. Materials do not imply goods related to usual consumption which has been recently reflected into a growing current account deficit. Real economic growth impacts in a positive manner the profitability at the level of all the industries, confirming the assumption that a prosperous macro-environment creates incentives to corporate profitability. Exchange rate volatility has a negative impact on the evolution of the corporate profitability only in the case of the pharmaceutical industry. This finding is in line with the assumption that pharmaceuticals concentrate its activity mainly on imports which implies a high sensitivity to exchange rate fluctuations.

Overall, macro-related variables determine to a high extent corporate profitability. In order to provide an accurate assessment of the corporate profitability, it is necessary for the analysts to consider also the macro-environment the company activates in. The conclusions of this paper must be interpreted within the context of the limitations imposed by the database dimension. Future research will keen on integrating into the research other macro-related indicators.

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