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EXPLORING THE LINK BETWEEN IDIOSYNCRATIC AND FUNDAMENTAL INDICATORS. EVIDENCE ON CEE CORPORATE SEGMENT

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Abstract. This paper explores the link between idiosyncratic and fundamental dimensions of the corporate finance within CEE countries. We elaborate a Vector Error Correction Model integrating both idiosyncratic and macro related indicators. We expect idiosyncratic variables to be closely related to the macro fudamentals and we anticipate the sign of the relation. Conclusions regarding the long term relationship between these variables differ by country from the perspective of the way the macro related variables enter the cointegration equations. The impact is different according to the peculiarities of the macroeconomic architecture.

1. Introduction

Recently there has been developed a consistent literature on the macro determination of the corporate default (see Mc Neil, Frey and Embrachts, 2005). Links between micro and macro variables closely related to corporate default have been pointed out. Alves (2006) 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 being deeply related to firm related variables. What it differentiates this approach is precisely the fact that there will be elaborated a Vector Error Correction Model integrating both idiosyncratic and macro related indicators as well as the focus oriented towards to the CEE countries. Until now all the research approaches have concentrated on the developed countries

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although there has been acknowledged that corporations are more exposed to macro volatility within emerging countries than in the developed ones (Hochrainer, 2006). There have been selected variables closely linked to the macroeconomic volatility – current account deficit, GDP, one year treasury bills interest rate, consumer price index - that have been integrated into a VECM grouping also indicators reflecting the financial soundness of the company.

The utility of this study is revealed in the context of the actual financial crisis where companies become more and more exposed to macroeconomic volatility and the link between micro and macro is strengthened.

In our research, fundamentals are embedded into GDP, one year treasury bills interest rate, current account deficit and consumption price index.

GDP is a key element of the macro fundamentals. Economic growth impacts positively corporate environment, creating a favourable context to employment, innovation, research and development, whereas recession brings corporate failure.

Litterature agreed on the fact that relation between GDP and corporate sector is a bilateral one. It is not only the GDP which exertes an impact on corporate segment, but also corporations that influe GDP at the aggregate level. One year treasury bills interest rate impacts corporations from the perspective of the finance mechanisms. A low interest rate facilitates corporate access to financing, ensuring a good level of liquidity as well as growth perspectives whereas a high interest rate prevents companies from financing the operational and investing activity (Lindé, 2002).

Recession implies inflation and consequently interest rate increase, which affects the capacity of the company to resort to external financing and to sustain growth.

Current account deficit is closely related to demand. A high current account deficit impacts positively economic growth by consumption. The integration of current account deficit as systemic variable represents an innovative part of the paper since previous researches have not approached it. The rationale for including this variable into the series of fundamentals consists of a peculiariaty of the emerging countries, especially from the perspective of the production structures performance. Since these countries go through a cathcing up process, internal deficient production capacities can not sustain growing consumption which is satisfied mainly by imports. This overlapping phenomenon of the imports reporting to exports triggers a high current account deficit.

Therefore, current account deficit is positively correlated with corporate profitability within emerging countries, but this phenomenon is revealed on short term. A persistent current account deficit has a negative impact on the macroeconomic environment on long term, bringing out the spectrum of the trade imbalance.

Idiosyncratic variables include asset management, liquidity, profitability and solvency ratios.

We expect idiosyncratic variables to be closely related to the macro fudamentals and we anticipate the sign of the relation.

We expect asset management, profitability and liquidity ratios to be positively correlated with GDP and current account deficit and negatively with one year treasury bills interest rate and consumption price index. Economic growth supported by a relaxed monetary policy creates incentive to sale increase and to tough inventory and accounts receivable management whereas recession and monetary tightening determine sale decrease and inventory turnover slowdown.

A high current account deficit usually accompanied by a low CPI creates incentive to an inflated demand which accelerates current assets turnover.

Having as reference chain transmission mechanism, we consider asset management ratios as key determinants of liquidity and profitability. Since company manages to ensure a good level of asset management indicators, this triggers a good liquidity level as well as gain potential.

The conclusions regarding the long term relationship between macro related and firm level indicators differ by country from the perspective of the way the macro related variables enter the cointegration equations. The impact is different according to the peculiarities of the macroeconomic architecture.

The article is structured as follows: Section 2 includes Data and methodology description, Section 3 is dedicated to Vector Error Correction Model analysis and Section 4 concludes.

2. Data and Methodology Description

Valorizing www.corporateinformation.com database as well as CEE Central Banks websites, there have been gathered quarterly financial data on 50 companies located into CEE countries (Romania, Poland, Czech, Slovakia, Hungary), covering the period from January 1997 to December 2008.

The variables used in order to build up the VECM model are integrated in Table I.

Table I: Idiosyncratic and fundamentals related variables

Variables	Symbol	Description
EBIT margin	Ebit_mg	Computed as the ratio between earnings before interest and taxes and turnover. Data extracted from www.corporateinformation.com site
Current liquidity	C_L	Computed as the ratio between current assets and current liabilities. Data extracted from www.corporateinformation.com site
Total Debt to equity	TD_Eq	Computed as the ratio between total debt and equity. Data extracted from www.corporateinformation.com site
Total Debt to EBIT	TD_EBIT	Computed as the ratio between total debt and earnings before interest and taxes. Data extracted from www.corporateinformation.com site
Consumer Price Index	CPI	Data extracted from the European Central Bank site
Interest rate corresponding to one year treasury bills	I_r	Data extracted from the European Central Bank site
Current account deficit	Def_cr	Computed as the weight of the negative current trade balance into GDP. Data extracted from the European Central Bank site
Economic growth	Ec_gr	Computed as Deflated Gross Domestic Product. Data extracted from the European Central Bank site

Source: own processing.

The VECM model can be specified at the level of every country as:

$$\begin{aligned}\Delta X_t &= \delta_0 + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \Gamma_3 \Delta X_{t-3} + \Gamma_4 \Delta X_{t-4} + \Gamma_5 \Delta X_{t-5} + \\ &\quad \Gamma_6 \Delta X_{t-6} + \Gamma_7 \Delta X_{t-7} + \alpha\beta" X_{t-1} + \varepsilon_t \end{aligned} \tag{2.1}$$

where:

$X_t = (log(EC\_GRt), I\_rt, CPIt, DEF\_CRt, C\_Lt, EBIT\_mgt, TD\_EQt, TD\_EBITt,$
$F\_OP\_CLt, DEBT\_EBITt)$,

$\delta_0 = \Gamma_0 - \alpha\beta_0$,

$\varepsilon_t \sim N(0, \Omega)$.

Vector error correction model is concentrated on two key parameters such as α and β.

β" matrix represents the cointegrating vector and incorporates long-term relationships between the endogenous variables.

α matrix reflects the dynamic adjustment of the endogenous variables to deviations from long-run equilibrium depicted by β"x.

Financial data included both idiosyncratic (profitability, liquidity, asset management and solvency ratios) and fundamentals (gross domestic product, interest rate on one year treasury bills, current account deficit, consumer price index) related indicators.

Profitability has been quantified by the earnings before interest and taxes margin, liquidity has been reflected by the current ratio whereas solvency ratios have been highlighted by the total debt reported to earnings before interest and taxes and by the total debt reported to equity, respectively.

Earnings before interest and taxes margin has been selected as a meaningful profitability indicator in spite of net profit because of the fact that research concentrates strictly on the core financial performance of the company, out of the fiscality impact. Moreover, previous researches pointed out that CEE companies develop a strong pecking order behavior (Nivorozhkin, 2002); therefore, interest expenses do not fall within the focus area.

Current ratio captures the operational equlibrium of the company enclosing its ability to meet the current obligations and to ensure proper asset management strategies. Solvency ratios reflect both the capital structure peculiarities as well as the company's capacity to cover the long term financial needs.

The correlation matrix points out that variables lack in multicollinearity.

There have been carried out unit root tests (Dickey Fuller, Phillips Perron) in order to analyze the series stationarity. These tests1 reveal out that all the variables (both idiosyncratic and fundamentals related indicators) are non-stationary (I(1) variables).

Non-stationarity can be interpreted as a CEE countries pecularity from the perspective of fragility and volatility of their micro and macroeconomic structures which triggers the impossibility of quick shock absorption.

3. VEC Model Analysis

Time series analysis points out that even if two or more series seem to be non-stationary, a linear combination of them may be stationary.

Johansen s methodology points out cointegration of time series including idiosyncratic and macro related indicators 1. Trace test indicates that we can reject the null hypothesis (i.e. there is no cointegration relationship) both at 1 and 5 per cent significance for most of the variables.

Before applying Johansen methodology, there has been checked up also Granger causality tests in order to highlight potential variable interdependencies and to draw up the assembley of endogenous variables.

Reported statistics highlight different numbers of cointegration vectors at the level of the CEE countries.

In the case of Romania and Czech there are 2 cointegration vectors while in the case of Slovakia, Poland and Hungary there is only one cointegration vector. Nevertheless, number of cointegration vectors does not exceed 2 out of the possible 7.

ECM applied at the level of the CEE countries reveals out idiosyncratic indicators as being highly impacted both by internal and macro related environment.

At the level of the CEE countries, there can be built up one cointegration equation including a relationship between profitability and a series of idiosyncratic indicators (current liquidity ratio, total debt reported to equity, total debt reported to earnings before interest and taxes) as well as an assembley of macro related indicators (GDP, consumer price index, interest rate corresponding to one year treasury bills and current account deficit weight out of GDP), except for Slovakia where only liquidity is explained by a cointegrated equation.

In order to test model's quality, we have ckecked up the roots of the characteristic polynomial which underline that VECM model is stable.

Analysis of the VECM statistic output at the level of every country reveals out profitability as the most frequent idiosyncratic indicator that is highly impacted both by firm and macro related variables which we consider to be a bidimensional determination.

The only country where profitability does not appear in this position is Slovakia, being replaced by liquidity. Nevertheless, liquidity is the second idiosyncratic variable that closely follows up profitability in terms of bidimensional determination.

As for Poland, profitability quantified by the earnings before interest and taxes margin depends on a series of firm related indicators (liquidity, leverage and solvency) as well as by macro related indicators (consumer price index, treasury bills interest rate and current account deficit).

All the idiosyncratic indicators impact positively profitability. A good liquidity position implies a high gain potential, ensuring financial obligations payment on time.

Table II. VECM estimates at the level of every country[1]

Poland	$Ebit\_mg = 0.0452 * C\_L + 0.01164 * TD\_EQ+$
	$0.001226 * TD\_EBIT + 0.068546 * CPI + 0.044496 * I\_R-$
	$0.014217 * DEF\_CR + 0.512 * Ec\_gr - 0.025324$
Czech Republic	$Ebit\_mg = 0.20308 * TD\_eq - 0.016114 * TD\_EBIT-$
	$0.25532 * CPI - 0.095081 * I\_r-$
	$0.040542 * Def\_cr + +0.184 * Ec\_gr + 0.69861$
Czech Republic	$C\_L = -3.557614 * TD\_eq + 0.31661 * TD\_EBIT+$
	$1.97522 * CPI + 2.09763 * I\_r-$
	$0.016873 * Def\_cr + +0.434 * Ec\_gr - 27.58$
Slovakia	$C\_L = -28364.98 * Ebit\_mg - 21188.94 * TD\_Eq-$
	$40.10954 * Ec\_gr - 1241.742 * CPI-$
	$4823.434 * Def\_cr - 4623.387 + 0.321 * Ec\_gr$
Romania	$Ebit\_mg = 0.20588 * TD\_Eq + 0.03256 * C\_L-$
	$0.001439 * TD\_EBIT + 0.05132 * CPI - 0.008979 * I\_r+$
	$0.061889 * Def\_cr + 0.01505 + 0.113 * Ec\_gr$
Romania	$Debt\_ebit = 143.073 * TD\_eq + 22.6281 * C\_L+$
	$35.6606 * CPI - 6.239987 * I\_r-$
	$43.00939 * Def\_cr + 10.4611 + 0.328 * Ec\_gr$
Hungary	$Ebit\_mg = 0.22142 * C\_L - 0.01816 * TD\_EBIT-$
	$0.919841 * TD\_EQ + 0.05411 * Def\_cr-$
	$0.166986 * I\_r + 1.11734 + 0.429 * Ec\_gr$

Source: own calculations.

Nevertheless, there are many studies which point out that a performant liquidity position of the company is frequently associated with a high opportunity costs (Chan-Lau, 2006) and with an inactive financial management strategy, leading to the loss of the profit perspective.

Depending on the business profile, financial managers have to ensure an appropiate liquidity level within the company, with a deep keen on the investing opportunities.

Solvency and leverage indicators impact positively profitability. A good solvency level ensures the financial balance of the company, keeping up the perspective to accumulate profit (Berk et al., 2007).

Leverage can be used as a profitability mobile as long as the cost of debt is inferior to the return on equity (Davydenko, 2005). Once the cost of debt is superior to the return on equity, a higher leverage leads to an increasing company risk level.

On the contrary, in the case of Hungary, Romania and Czech, solvency is negatively related to profitability which is in line theories on the pecking order behaviour developed within CEE countries corporate segment (Köke,Salem, 2006).

[1]For space saving reason, statistic output/tests have not been included in the paper, but they are available anytime upon request

Studies on corporate finance within CEE countries revealed that companies are reluctant to indebtedness, concentrating on internal financing which triggers the loss of growth and profitability perspective.

This idea is also confirmed by the way leverage joins the cointegration equation in the case of Slovakia and Hungary where as in the case of Czech, Poland and Romania leverage impacts positively profitability.

As for Poland and Czech, this conclusion is validated from the perspective of the capital market development degree. Having as reference the complexity of the financial instruments traded on the capital market as well as the liquidity indicator, Poland has the most performant capital market within CEE region which implies a higher access of the corporate segment to various financing opportunities and a more receptive attitude to indebtedness.

Thus, leverage, as long as it is carefully managed, has a positive impact on profitability.

Regarding the macro related indicators, there are differencies at the country level concerning the frequency they are integrated into the VECM.

CPI determines profitability in the case of all CEE countries, except for Hungary.

Liquidity and solvency ratios are also CPI impacted in the case of Hungary and Czech. What it is really interesting is the sign under which this macro variable integrates into the model.

Excepting two cases, CPI impacts positively the firm-related indicators. Our initial assumption involved the negative impact of the CPI on the firm level variables from the perspective of the macroeconomic disequilibrium determined by excessive inflation.

This is in line with the findings of Asberg and Shahnazarian (2008) who point out that CPI determines positively Expected Default Frequency indicator.

Nevertheless, we mentioned a potential positive impact under the hypothesis of an inflated demand specific to the periods characterized by a low interest rate which generates ultimately inflation.

The most frequent situation (positive impact of the CPI on the firm related variables) is specific to the CEE countries where economic growth favourable to corporate segment is consumption oriented, which confirms the assumption of inflation by demand.

In most of the cases, interest rate corresponding to one year treasury bills enters negatively the cointegration equations.

A low interest rate is associated with economic growth which implies an easy access of the corporate sector to external financing as well as a high activity turnover and profitability.

Similarly to CPI, current account deficit impact on firm related variables can be construed both positively and negatively.

The impact is positive in case of Romania, confirming a growing demand determined by the consumption oriented economic growth and by the catching up process supported by a high current account deficit.

In the other cases, current accout deficit impacts negatively firm related variables, validating mainly the idea that a growing current account deficit determines a macroeconomic desequilibrium which has a negative influence on firm related indicators.

In line with the findings of Jacobson and Kasper (2005), real GDP has a positive impact on all the firm related indicators, outlining the idea that economic growth creates favourable context to corporate segment.

Concentrating on the impact magnitude, in most cases interest rate corresponding to one year treasury bills as well as CPI and current account deficit appear to exert the utmost influence on the profitability.

Liquidity is impacted to a high extent by GDP and current account deficit.

Overall, macro fundamentals are deeply correlated with the idiosyncratic indicators, having a strong impact on the profitability and liquidity. Moreover, VECM reflects the long-run relationships between the variables. This finding is precious from the perspective of the global corporate strategies which have to be built up in a close relationship with macroeconomic enviroment.

4. Conclusions

ECM applied at the level of the CEE countries reveals out idiosyncratic indicators as being highly impacted both by internal and macro related environment.

Analysis of the VECM statistic output at the level of every country reveals out profitability as the most frequent idiosyncratic indicator that is highly impacted both by firm and macro related variables which we consider to be a bidimensional determination.

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These ideas unveil a new perspective on country risk diversification/mitigation concept. The delocalization of multinational companies into emerging countries has represented an important business strategy from the perspective of risk diversification. There has been acknowledged in the literature that targeting new geographic areas may improve the overall risk management system (Triandafil, Brezeanu, 2008). The potential risk mitigation process achieved by the intermediary of a highly diversified delocalization policy is questionable since during turbulent periods of time, countries become more interrelated. The conclusions of the study point out that from the perspective of the financial contagion phenomenon, delocalization into CEE countries does not represent the proper alternative.

As for model's predictive power, the findings allow us to expect a strengthening of the link between microeconomic and macroeconomic dimensions, meaning that companies will be more and more exposed to macroeconomic fundamentals which will imply effective mutations into risk management strategies. Cross-border corporate groups have to implement financial strategies based on systemic risk counteraction.

The conclusions of this paper must be interpreted in the context of the limitations imposed by the database dimension the research was performed on.

Future research will keen on enlarging the methodology and extending the focus on developed countries as well.

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