International Journal of Business, Human and Social Sciences
ISSN: 2517-9411
Vol:6, No:9, 2012

Preliminary Views on the Determinants of the Cost of Capital for the Emergent Market of Romania

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***Abstract*—**This paper investigates several factors affecting the cost of capital for listed Romanian companies. Although there is a large amount of literature investigating the drivers of the cost of capital internationally, there is currently little evidence from emergent markets. Based on a sample of 19 Romanian listed companies followed by financial analysts for the years 2008-2010, according to Thomson Reuters' I/B/E/S data base, the paper confirms the international trends, showing that size, corporate governance policies, and growth are negatively correlated with the cost of capital.

***Keywords*—**Corporate governance, determinants of the cost of capital, emergent markets.

I. Introduction

THERE is a large body of literature investigating the determinants of the cost of capital internationally, factors such as size, growth, disclosure or corporate governance policies being documented as important drivers which contribute to a decrease in the cost of capital. However there is currently little evidence concerning emergent markets. One of the main reasons for the scarcity of such research in emergent markets is the short series of data, as these markets were recently established ([20]), and because of the small numbers of listed companies that they feature.

Bucharest Stock Exchange (BSE) is one of these emergent markets, recently reopened in 1995 after it was closed down during the Communist Regime, with a small number of companies listed and traded and with an even smaller number of companies "officially" followed by financial analysts, with little forecasted data available in public databases.

However, based on rather scares data available, this paper intends to offer a preliminary perspective on the magnitude of the cost of capital of listed Romanian companies and its drivers. Due to the type of data available, the analysis is focused on the year 2008, which is the year when the financial crisis first seriously affected Romania, and the BSE especially, its market capitalization dropping by 69%, and its ratio of market capitalization to GDP dropping from 17% in 2007 to only 5% in 2008.

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The authors gratefully acknowledge the financial support offered by CNCSIS – UEFISCSU through the project PNCDI II: ID_1840/2008/IDEI II: "The benefits of IFRS adoption: an exploratory research regarding the impact of the internationalization of Romanian accounting on the cost of capital".

II. Literature Review

A. Cost of Capital Constructs

Botosan and Plumlee ([3]) review five formulae for the estimation of the cost of capital and discuss their construct validity. All of the five constructs are based on the common definition of the cost of capital as the *risk-adjusted discount rate* that investors apply to the expected dividends to determine the current stock price.

$$P_t = \sum_{\tau=1}^{\infty} \frac{E_t(Div_{t+\tau})}{(1+r)^{\tau}} \quad (1)$$

where:
P_t= the price of the stream of dividends at time t;
$E_t(Div_{t+\tau})$= the expectation of the dividend distributed in year $t+\tau$;
r= the cost of capital

This valuation formula poses some empirical problems, as only the stock price is directly observable empirically, whereas future dividends require *estimation*. As the cash-flows are spanning infinite time periods while analysts' forecasts (the primary source of cash-flows estimations) only span limited time horizons (usually 3-5 years), in empirical implementations the impact of future cash-flows occurring beyond the analysts' forecast horizon collapses into a single number called *the terminal value*.

The differences between the five cost of capital constructs reviewed by Botosan and Plumlee ([3]) consist in how the terminal value is estimated. These formulae for the risk premium (PREM) have been developed over time and while some (e.g. $r_{DIVPREM}$ or $r_{PEGPREM}$) carry the name of the traditional model (like dividend discount model – $r_{DIVPREM}$ or Price-Earnings Growth model – $r_{PEGPREM}$) others (e.g. $r_{GLSPREM}$) are named by their proponents ([11]).

a. $r_{DIVPREM}$

The $r_{DIVPREM}$ proxy is derived directly from the dividend discount formula and uses direct estimations of the future dividends from financial analysts for a five years time span. The equation that allows the estimation of $r_{DIVPREM}$ is:

$$P_0 = \sum_{t=1}^{5}((1 + r_{DIV})^{-t} dps_t) + (1 + r_{DIV})^{-5}(P_5) \quad (2)$$

where:
P_0 = price at time *t=0* (the estimation moment);
P_5 = price at time *t=5*;
r_{DIV} = estimated cost of equity capital;
dps_t = dividend per share at time t.

A key point in this model is finding out a proxy for P_5 the price at time t=5. Empirically, P_5 operationalized through the long-run price range forecasted by analysts. Thus, it is implicitly assumed that this long-run *analyst* forecast of the price will be coherent with the *market* valuation of the stream of dividends. This is the assumption that distinguishes $r_{DIVPREM}$. It is also important to note that this model has no anchor in accounting numbers. Neither observed book-values nor observed earnings figures enter directly in the estimation formula.

b. $r_{GLSPREM}$

This proxy describes the so called industry method as proposed by Gebhardt, Lee and Swaminathan ([11]) (GLS). It is grounded in the well known *residual income valuation model* where the price of a stock is equated by the sum of *the book-value of equity* and *the continuation net present value of the future residual income*. Unlike $r_{DIVPREM}$, the $r_{GLSPREM}$ model assumes a wider forecast window of 12 years. Likewise, under this approach, it is assumed that beyond the analysts' forecast horizon *the return on equity* (ROE) *for a firm* reverts to *the industry-specific ROE*. Therefore, for a successful implementation of this proxy unbiased estimates of industry-level ROE are critical. Given these assumptions, the model for $r_{GLSPREM}$ is shown below:

$$P_0 = b_0 + \sum_{t=1}^{11}((1 + r_{GLS})^{-t}\left((ROE_t - r_{GLS})b_{t-1}\right) + (r_{GLS}(1 + r_{GLS})^{11})^{-1}\left((ROE_{12} - r_{GLS})b_{11}\right) \quad (3)$$

where:
ROE_t = return on equity for period t;
eps_t = forecasted earnings per share in year t;
b_t = book-value per share year t;
r_{GLS} = estimated cost of equity capital

Unlike $r_{DIVPREM}$, $r_{GLSPREM}$ is anchored in the accounting book value of equity.

c. $r_{GORPREM}$

$r_{GORPREM}$ is groundend in the Gordon Growth Model. It requires another assumption about ROE, though of a rather different nature than the one required by $r_{GLSPREM}$. The $r_{GORPREM}$ proxy, assumes that beyond the forecast window a firm's ROE converges to the very cost of equity capital. Like $r_{DIVPREM}$ this proxy assumes that short/term analysts' dividend forecasts reasonably reflect the market expectation. But in addition, $r_{GORPREM}$ assumes that the long-run earnings per share estimation is a robust estimation of the terminal value. The model is captured by the equation below:

$$P_0 = \sum_{t=1}^{4}((1 + r_{GOR})^{-t} dps_t) + (r_{GOR}(1 + r_{GOR})^{-4})(eps_5) \quad (4)$$

where:
r_{GOR} = the estimated cost of capital, and the rest of the variables are defined as above.

d. $r_{OJNPREM}$

This is the so called economy-wide growth model since the estimation of the cost of capital is affected by a variable $\boldsymbol{\gamma}$that captures economy-wide growth, a feature that does not transpire clearly in prior models. The derivation of the model is rather convoluted and involves serious mathematical teasing of the dividend discount formula. This method and the next one too give a direct expression of the cost of equity capital:

$$r_{OJN} = A + \sqrt{A^2 + \frac{eps_1}{P_0} \times \left(\frac{eps_2 - eps_1}{eps_1} - (\gamma - 1)\right)} \quad (5)$$

where $\boldsymbol{A = \frac{1}{2}((\gamma - 1) + \frac{dps_1}{P_0}}$ and $\boldsymbol{\gamma}$ is the economy-wide growth.

Like most of the models before, this one two assumes that both dividends and earnings per share as forecasted by analysts do indeed reflect the estimations of the market.

e. $r_{PEGPREM}$

Finally this last alternative proxy is grounded in the price/earnings growth model. Its underlying assumption is that beyond the forecast period there is no growth in the abnormal earnings. Mathematically, this translates into *dps1*=0 and γ=0. Going back to the formula of the previous model then $r_{OJNPREM}$ reduces itself to:

$$\boldsymbol{r_{PEG} = \sqrt{\frac{eps_2 - eps_1}{P_0}}} \quad (6)$$

As seen above this last item has close ties with the previous one and therefore involves similar assumptions and even more.

Botosan and Plumlee ([3]) argue that the PEGPREM model dominates the alternatives for the US market in terms of the correlations with the frequently cited risk proxies, although, previous research (such as [9]) concluded that this model is the worst performer. Consequently, the literature has not yet reached common grounds on the construct validity of the cost of capital, not even for US companies ([1]).

B. Previous Research on the Determinants of the Cost of Capital

There is a large body of research investigating the drivers of the cost of capital internationally, factors such as size, growth, disclosure or corporate governance policies being documented as important drivers which contribute to a decrease in the cost of capital.

Firm size was first shown to be negatively correlated with the cost of capital by Fama and French ([10]). Hail and Leuz ([13]) also found a negative correlation between firm size and the cost of capital. Hail and Leuz ([13]) furthermore

documented a positive association between the stock return variability (as a proxy for market risk) and the cost of capital.

Another positive correlation was documented by Dhaliwal et al. ([8]), who showed that the cost of equity is positively associated with leverage.

Fama and French ([10]), Gebhardt et al. ([11]); Gode and Mohanram ([12]); Hail and Leuz ([13]) found that stock return volatility is positively related to book to market ratio, implying a negative impact of the market to book ratio on the implied cost of equity. Long term growth rate was also proved to have a positive impact on the cost of equity ([11] and [12]), as the market is expected to perceive high growth firms riskier.

There is also evidence that the magnitute of the cost of capital varies according to industry membership ([11], [12], and [13]).

Corporate governance was also shown to be an important driver of the cost of capital. Chen, Chen şi Wei ([5]), Koerniadi şi Tourani Rad ([16]), and Zhu (21) all showed that better corporate governance provisions lead to a lower cost of capital.

Disclosure was another important factor investigated by the literature, as disclosure quality is expected to increase transparency and comparability and, consequently decrease the cost of capital. An important stream of literature has concentrated on the relationship between the adoption of IFRSs by listed companies and their cost of capital but the results are contradictory. For example, the study by Leuz and Verrecchia ([17]) on a sample of German companies that switched to either IAS/IFRS or to US GAAP reveals that the reduction in the information asymmetry generated by higher-quality disclosure actually led to lower costs of capital.

On the other hand the study developed by Jermakowicz and Gornik-Tomaszewski ([15]) that investigates the reaction of the companies listed across EU to the implementation of the IFRSs has shown that by 2004 (prior to the compulsory adoption at EU level of IFRSs) the companies did not expect a decrease of their cost of capital. Furthermore, Daske ([7]) based on a sample of German firms that claimed compliance with either IAS/IFRS or US GAAP did not establish the inverse relationship between the adoption of the international standards and the decrease in the cost of capital. In addition, this research has shown that during the transition phase, the cost of capital actually moved up for the companies that did not apply national regulations.

Similar results were reported by Bruggemann and Homburg ([2]) who expanded the Leuz and Verrecchia ([17]) study to a larger sample. In addition the model developed by Leuz and Verrecchia ([17]) has been refined to accommodate the reaction of some companies to the adoption of IFRSs or US GAAP. Despite the larger sample and other methodological extensions, the Bruggemann and Homburg ([2]) study could not establish a relationship between the reporting policy and the cost of capital.

Another study developed by Christensen *et al.* ([6]) focused on the consequences implied by the compulsory and only on those voluntary adoptions of IFRS. This research has shown that the tendency of the firms to adopt IFRSs anticipates short term market reactions and long term changes in the cost of capital. Therefore, the paper concludes that the compulsory adoption of IFRSs (as it was the case across EU for consolidated companies starting with 2005) does not generate benefits equally for all the firms, some of them experiencing decreases while other increases in the cost of capital.

There is currently little evidence on the drivers of the cost of capital in emergent markets. For instance, Omran & Pointon ([20]) investigated the determinants of the cost of capital for the emergent market of Egipt on a sample of 119 companies, and showed that growth and size are important factors affecting the cost of capital. They also found financial and business risks as significant factors for actively traded companies and for heavy industries, and fixed asset backing for the contracting and real estate sector. In the food sector, liquidity is one of the important determinants.

Nasr, Boubakri and Cosset ([18]) also investigated the drivers of the cost of capital in post-privatization contexts and showed that enhanced government control leads to increases in the cost of capital, after controlling for firm-level and country-level variables, as managers in state owned enterprises are expected to run the company to meet government leaders' political objectives, rather than to maximize profits.

III. Methodology

The sample was comprised of 19 companies listed on Bucharest Stock Exchange followed by financial analysts according to Thomson Reuters' I/B/E/S data base. Based on the data available we could compute the cost of capital using the GORPREM and PEGPREM model. Some data was missing, such as forecasted data for the year 2000, or historical data before 2008, as some of the companies were listed in 2008.

Due to the small number of observations, the effect of various factors on the cost of capital was analyzed by the following simple regression model:

$$CC = \alpha_0 + \alpha_1 D + \varepsilon$$

Where:

CC: The cost of capital for the year 2008 computed based on GORPREM or PEGPREM model.

D: Determinants of the cost of capital, as follows:

IndGOV An aggregate index for corporate governance computed by Olimid et al. (19) for listed Romanian companies based on three characteristics of the board of administrators (board size, proportion of non-executive directors, duality for the Chairman and Director General).

LOG_SIZE Natural log of the market value of equity at the end of 2008.
STOCK_RETURN Stock return for the year 2008, based on the end of the year prices for 2007 and 2008.
GROWTH Short term growth based on the earnings per share for the years 2007 and 2006.
LEVERAGE: total liabilities/equity for the year 2007, as a proxy for financial risk.
STATEOWNERSHIP: An indicator variable equal to 1 for companies wholly or majority-owned by the state, and 0 otherwise.

We expect the coefficients on IndGOV, LOG_SIZE, GROWTH and STOCKRETURN to be negative, consistent with a decrease in the cost of capital, and the coefficients on LEVERAGE and STATEOWNERSHIP to be positive, as financial risk as well as the prospect for less efficiently managed state-owned entities may lead to an increase in the cost of capital.

TABLE I
DESCRIPTIVE STATISTICS

	N	Minimum	Maximum	Mean	Std. Deviation
		Cost of Capital			
PEGPREM Model	10	0	1,78	,42	,59
GORPREM Model	14	,12	1,76	,43	,48
		Determinants			
IndGOV	14	,22	1	,75	
LOG_SIZE	14	15,65	23,05	19,09	2,18
STOCK_RETURN	14	-,97	-,20	-,74	,21
GROWTH	10	-,47	,67	-,034	,31
LEVERAGE	11	,26	1,77	,74	,45
STATE OWNERSHIP	14	0	1	,86	,36

IV. RESEARCH RESULTS

The measures of the cost of capital computed based on the DIVPREM and PEGPREM models are presented in Table I.

Both models, PEGPREM and GORPREM, generate rather large values for the cost of capital: a mean value of 41,75% and 42,58% respectively. However, this situation is to be expected, as in 2008 the BSE was severely affected by the financial crisis that cut its market capitalization by 69%, bringing down the ratio of market capitalization to GDP from 17% in 2007 to only 5% in 2008.

Although both models give similar mean values for the cost of capital, only the PEGPREM model reacts to some of the independent variables proposed (see Table II below).

As expected, firm size and the corporate governance index are negatively correlated with the cost of capital. Growth also seems to have a negative impact on the cost of capital (at 0.1 level of significance), but neither of the other variables proposed.

TABLE II
REGRESSION RESULTS

PEGPREM MODEL	**Model 1**			**Model 2**			**Model 3**		
Variables	Coefficients	t	Sig.	Coefficients	T	Sig.	Coefficients	t	Sig.
(Constant)	1,264	5,596	,000	2,661	3,316	,004	-,152	-,409	,687
IndGOV (-)	-1,121	-3,912	,001						
LOG_SIZE (-)				-,118	-2,807	,012			
STOCK_RETURN (-)							-,770	-1,570	,134
Observations	14			14			14		
R square	,460			,305			,120		
F statistic	15,304 (sig. ,001)			7,882 (sig. ,012)			2,465 (sig. ,134)		
Durbin Watson	1,733			1,676			1,579		

PEGPREM MODEL	**Model 4**			**Model 5**			**Model 6**		
Variables	Coefficients	t	Sig.	Coefficients	T	Sig.	Coefficients	t	Sig.
(Constant)	,392	4,861	,000	-,152	-,409	,687	,132	,501	,622
GROWTH (-)	-,771	-2,040	,056						
LEVERAGE (+)				-,770	-1,570	,134			
STATEOWNERSHIP (+)							,333	1,144	,268
Observations	14			14			14		
R square	,188			,120			,068		
F statistic	4,163 (sig. ,056)			2,465 (sig. ,134)			1,308 (sig. ,268)		
Durbin Watson	1,766			1,579			2,027		

V. Conclusion

The paper estimated the cost of capital for listed Romanian companies for the year 2008, when the BSE was severely hit by the financial crisis. Based on two models used (PEGPREM and GORPREM), the cost of capital was estimated at approximately 42%, a large amount, but expected taking into account the circumstances. The paper also showed that larger companies, as well as those with better corporate governance provisions were able to benefit from a smaller cost of capital than the rest.

The main limitation of the paper comes from the small number of listed companies followed by financial analysts and the limited period covered, which prevented us from having a broader look at the market and compare the cost of capital before and after the financial crisis hit or before and after other major events, such as the adoption of IFRS.

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