IMPACT OF FINANCIAL CRISIS ON CONSTRUCTION FIRM`S COST OF CAPITAL

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The average cost of debt is negatively related with size, tangibility, firm growth, the leverage ratio, and the ratio of long- to short-term debt and positively to profitability. We find that the recent international crisis did have a significant impact on the set of firms in our sample, but affected the way in which leverage and the interest to debt ratio relate to firm fundamentals. In this article, we want to study the impact of financial crisis on the cost of capital using a sample of construction companies.

Keywords: asset pricing cost of capital, financial crisis,CAPM

Cod JEL: G12, G01, G14

1. Introduction

An appealing feature of the subprime crisis for research purposes is that it stands as a purely exogenous shock on the corporate sector, the crisis had its origin in the U.S. housing sector. In inquiring about the influence of financing factors on real investments, it is extremely difficult to disentangle supply and demand forces. For instance, a given observed contraction in real assets may be forced by the withdrawal of lending flows by their suppliers or to a voluntary corporate decision to stay aside from the credit market after the reevaluation of expected cash flows in the midst of an economic downturn. Even an exogenous credit supply shock like the one taking place since 2007-2008 may have reshaped the demand for funds in response to a widespread wave of pessimism.

The problems on the international financial markets affected the construction industry, which was heavily dependent on banking credit. Non-residential construction, which accounts for half of the construction output, was strongly hit, while residential decreased only slightly in 2009 and civil engineering, which depends on public funding, was the only one maintaining above the line.

The construction sector in Romania climbed 6.9% in december 2009, in comparison to a month before, recording the biggest leap in the European Union. The total decrease in 2009 year in comparison to the last year was 15.1%. In chart no. 1, we present the evolution of constructions during 2005-2009.

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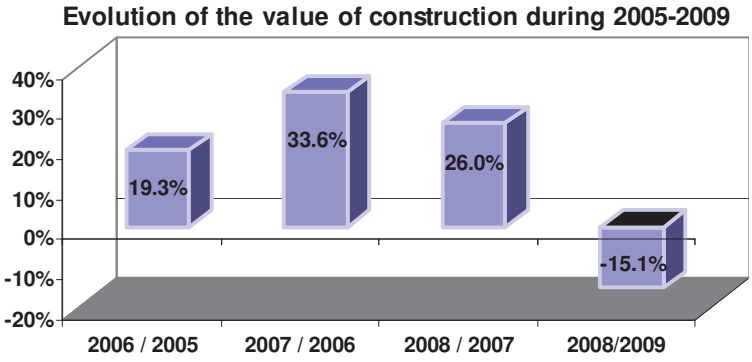
Chart no. 1



Source: www.insse.ro

Since december 2008, however, construction dropped 7.1%, Romania ranking 8 in the EU. In november, Romania recorded the third decline in the construction sector in the EU – 18.9% - in comparison with the same months of 2008. Apart from Romania, the only EU country to record a growth in the construction sector was Spain – 6.2%. The biggest declines were recorded in Slovakia (-11.3%), Slovenia (-8.1%) and Bulgaria (-7.9%).

2. Methodology research

We propose to study the impact of financial crisis on the cost of capital. We choose the construction sector (construction of buildings and civil engineering), because it is one of the most affected sectors of the economy. The sample includes ten companies, which are listed on Bucharest Stock Exchange: Impact Developer & Contractor S.A. (IMP), Cominco S.A. Bucuresti (COBS), Comnord S.A. Bucuresti (COSC), Concefa S.A. Sibiu (COFI), Constructii Bihor S.A. Oradea (COBJ), Imotrust S.A. Arad (ARCV), Socot S.A. Tg. Mures (SCTO), S.C. Transilvania Constructii S.A. (COTR), Compania Energopetrol S.A. (ENP), Condmag S.A. (COMI).

To determine the cost of capital, we use the capital assets princing model (CAPM) and weighted average cost of capital (WACC).

2.1 Cost of equity

The cost of equity can be defined as the minimum rate of return that a company must earn on the equity-financed portion of its investments in order to leave unchanged the market price of its stock. Most companies use the Capital Asset Pricing Model (CAPM) to calculate their cost of equity capital. In the CAPM definition, the cost of equity is equal to the return on risk-free securities plus the company's systematic risk (beta) multiplied by the market risk premium:

$$\overline{R_a} = R_f + \beta_a * (\overline{R_M} - R_f);$$

Where:

R_f = Risk free rate

β_a = Beta of the security

$\overline{R_M}$ = Expected market return

$R_f - \overline{R_M}$ = Premium risk

The general idea behind CAPM is that investors need to be compensated in two ways: time value of money and risk. The time value of money is represented by the risk-free rate in the formula and compensates the investors for placing money in any investment over a period of time. The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) that compares the returns of the asset to the market over a period of time and to the market premium risk.

The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken. The security market line plots the results of the CAPM for all different risks (betas).

Beta coefficient is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. Beta is the tendency of a security's returns to respond to swings in the market. A beta of 1 indicates that the security's price will move with the market. A beta of less than 1 means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market. Many utilities stocks have a beta of less than 1, offering the possibility of a higher rate of return, but also posing more risk. The formula for the beta of an asset within a portfolio is:

$$\beta = \frac{Cov\,(R_a, R_M)}{Var\,(R_M)}\ ;$$

Where:

R_a = the rate return of the asset

R_M = the rate return of the market.

Risk-free rate is the amount obtained from investing in securities considered free from credit risk, such as government bonds from developed countries. The interest rate of U.S. Treasury Bills is frequently used as a proxy for the risk-free rate.

The equity market risk premium represents the returns investors expect to compensate them for taking extra risk by investing in the stock market over and above the risk-free rate. In other words, it is the difference between the risk-free rate and the market rate. It is a highly contentious figure. Many commentators argue that it has gone up due to the notion that holding shares has become more risky.

2.2 Weighted Average Cost of Capital

Weighted Average Cost of Capital is an average representing the expected return on all of a company's securities. Each source of capital, such as stocks, bonds, and other debt, is assigned a required rate of return, and then these required rates of return are weighted in proportion to the share each source of capital contributes to the company's capital structure. The resulting rate is what the firm would use as a minimum for evaluating a capital project or investment:

$$\text{WACC} = \frac{E}{V} * \text{Re} + \frac{D}{V} * Rd * (1 - Tc)\,;$$

Where:

Re = cost of equity

Rd = cost of debt

E = market value of firm`s equity

D = market value of firm`s debt

V = E + D
Tc = corporate tax rate

The WACC of a firm increases as the beta and rate of return on equity increases, as an increase in WACC notes a decrease in valuation and a higher risk.
Broadly speaking, a company's assets are financed by either debt or equity. WACC is the average of the costs of these sources of financing, each of which is weighted by its respective use in the given situation. By taking a weighted average, we can see how much interest the company has to pay for every dollar it finances. A firm's WACC is the overall required return on the firm as a whole and, as such, it is often used internally by company directors to determine the economic feasibility of expansionary opportunities and mergers. It is the appropriate discount rate to use for cash flows with risk that is similar to that of the overall firm.
Compared to cost of equity, cost of debt is fairly straightforward to calculate. The rate applied to determine the cost of debt (Rd) should be the current market rate the company is paying on its debt. If the company is not paying market rates, an appropriate market rate payable by the company should be estimated. The measure can also give investors an idea as to the riskiness of the company compared to others, because riskier companies generally have a higher cost of debt.
As companies benefit from the tax deductions available on interest paid, the net cost of the debt is actually the interest paid less the tax savings resulting from the tax-deductible interest payment. Therefore, the after-tax cost of debt is Rd (1 - corporate tax rate).

3. Data and estimation

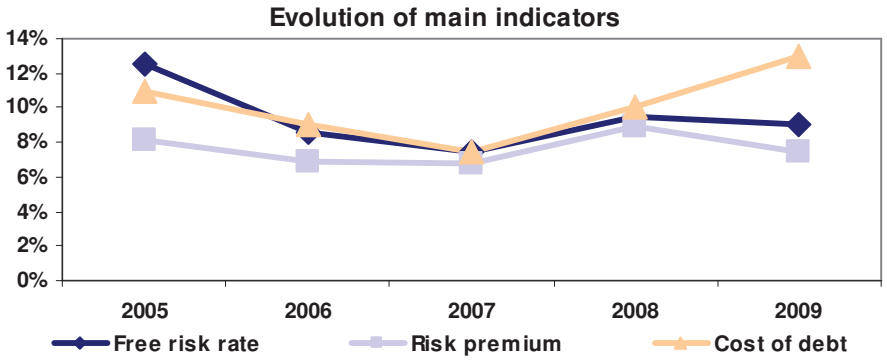
The sample of ten companies is studied during the period 2005-2009. We select the companies whose stock price increased significantly, respectively they had a significant market capitalization and volume of transactions on the Bucharest Stock Exchange, during the analyzed period.
For the coefficient Beta, we use the daily stock return prices of the analyzed companies and the daily returns of BET index during 2002-2009. The Beta coefficient is determined individually for each year. Thus for 2005, we consider daily stock return from 2002-2005. We consider the daily stock return from 2003-2006 for the beta coefficient from 2006. We kept this method of calculation for all five years. Table nr.1 lists the beta coefficient values during 2005-2009.

Table no. 1

Evolution of coefficient BETA					
Tiker	2005	2006	2007	2008	2009
IMP	0.610	0.592	0.709	1.048	-1.671
COBS	0.032	0.297	0.382	0.613	0.679
COSC	-0.164	0.085	0.195	0.571	0.735
COFI	0.048	-0.067	0.331	0.694	1.032
COBJ	-0.003	0.020	-0.080	-0.042	0.057
ARCV	0.063	0.067	0.102	0.527	1.062
SCTO	0.001	0.018	0.530	0.538	0.686
COTR	0.101	-0.957	-1.039	-0.326	-0.320
ENP	0.783	0.789	0.779	0.755	0.261
COMI	0.275	0.386	0.381	0.822	0.942

Source: Author`s calculations

Chart no. 2 contains values of the indicators that we need to use for the Capital Assets Pricing Model. The risk free rates are taken from National Bank of Romania.



The risk premiums and cost of debt are obtained from Moody`s reports.

Chart no. 2

Source: http://pages.stern.nyu.edu, www.reuters.com, www.bnr.ro

Using the CAPM and the data from the previous two tables we obtained the cost of equity for the companies from our sample. In table no. 2 we show the obtained values. We can see the strong impact of the financial crisis on the cost of equity. In 2006, its value decreased from the previous year, but from 2007 year to 2009 year, resumed its upward trend.

Table no. 2

Cost of equity					
Tiker	2005	2006	2007	2008	2009
IMP	17.49%	12.71%	12.34%	18.83%	-3.48%
COBS	12.76%	10.66%	10.10%	14.95%	14.07%
COSC	11.16%	9.19%	8.83%	14.59%	14.49%
COFI	12.89%	8.14%	9.75%	15.68%	16.71%
COBJ	12.47%	8.74%	6.95%	9.12%	9.42%
ARCV	13.02%	9.06%	8.20%	14.19%	16.93%
SCTO	12.51%	8.73%	11.11%	14.29%	14.13%
COTR	13.33%	1.96%	0.41%	6.60%	6.61%
ENP	18.91%	14.08%	12.81%	16.22%	10.95%
COMI	14.75%	11.28%	10.10%	16.81%	16.04%

Source: Author`s calculations

We obtained the percentage of equity and debt on total capital from the financial statements of the analyzed period. Finally, using weighted average cost of capital model and the information obtained in previous tables, we highlighted the value of the cost of capital. The values obtained are shown in table number 3.

Table no. 3

Weighted average cost of capital					
Tiker	2005	2006	2007	2008	2009
IMP	14.28%	10.63%	10.36%	15.12%	1.99%
COBS	11.56%	9.50%	8.36%	11.54%	13.41%
COSC	11.05%	9.08%	8.28%	12.34%	13.89%
COFI	11.62%	8.71%	8.26%	11.85%	14.28%
COBJ	11.92%	8.84%	7.14%	9.42%	10.75%
ARCV	12.69%	9.06%	7.94%	12.22%	14.75%
SCTO	11.53%	8.87%	9.15%	11.78%	13.48%
COTR	12.07%	5.96%	4.08%	7.30%	7.67%
ENP	16.55%	11.80%	10.06%	12.16%	12.33%
COMI	12.71%	9.83%	8.89%	14.10%	14.88%

Source: Author`s calculations

During 2005-2007, the cost of capital decreased significantly from 25% (Comnord S.A.) to 66% (Transilvania Constructii). In this period the construction sector had a favorable environment.
In 2008, the value of construction and assembly works in Romania increased by 34% nominally (26% in real terms), to RON 83bn (€22.5bn). The fastest growing segment was non-residential, which increased by 37%. The situation is due to the fact that Romania, a country with a very rapidly developing economy, needed mainly non-residential buildings, such as office space for services and industrial buildings. Structural works are by far the ones covering the largest share of costs of a construction project, followed by installation and equipment and site preparations. The smallest shares are held by finishings and rental of construction equipment.
The cost of capital increased, during 2007-2008, from 21% (Compania Energopetrol) to 79% (Transilvania Constructii) due to the appearance of the financial crisis. The crisis had a negative effect on the cost of equity, stock returns and private physical investment. In 2009, we can see that the growth is not so big, it is from 1% (Compania Energopetrol) to 21% (Imotrust Arad, Concefa Sibiu).
The value of the cost of capital for Impact Developer company is small, because its stock price decreased significantly during 2007-2009 (its value was under the nominal value of the stock).

4. Conclusions

Increasingly more companies found that loans can not be consider a certainty. It seems that more restrictive lending standards and rising interest rates are "new rule" not only on international markets, but also in Romania. A feature of Romanian companies is that they rely primarily on financial banks institutions, calling rarely to publicly traded bonds. As the liquidity crisis continues to limit available funds on international capital markets, the ability of banks to provide capital is affected.
The cost of debt constitutes a key transmission channel from macroeconomic shocks to the corporate sector, with a direct bearing on firms' growth and probability of default, a better understanding of its drivers should be welcome.
Construction was the most important factor of the strong economic growth of Romania over the past several years. However, the problems on the international financial markets affected the construction industry.
The segment which will continue to grow in 2010 is civil engineering. As Romania will face a falloff in GDP in 2009, the government will want to overcome its effects by increasing public spending, and infrastructure is a top destination for state-funded investments. For that, the funding coming mainly from the EU has to be unblocked, by improving and simplifying procedures which have been dragging investments in infrastructure – particularly in the case of road construction, which accounts for roughly half of the civil engineering construction output. Additionally, civil engineering construction can benefit from the lower prices of construction materials compared to the past few years.
We propose for next studies to use a bigger sample and to study the impact of crisis on companies cost of capital by the methods of Godfrey and Espinosa (1996), Erb, Harvey and Viskanta (1996), Damodaran (1998) and Estrada (2000).

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