The Dependence of the Cost of Capital on Degree of Diversification

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ABSTRACT

The subject of this paper are theoretical and methodological aspects of determining the cost of capital on the example of two companies from the Energoprojekt system. The goal is to point out the most significant problems of determining the cost of capital in general, as well as to identify the most significant determinants of those costs. In addition, the paper has a goal to point out to the degree of impact of diversification of those two companies on the cost of their capital. Using the CAPM, the total cost of capital is calculated for Energoprojekt Holding and Energoprojekt Industrija. In accordance with that, the following hypotheses are formulated: (H0) The value of the beta coefficient of both enterprises is equal to zero, (H1) Volatility of the yield of shares of both companies is higher than the entire market, (H2) The total cost of the Holding's capital is lower than the total cost of the capital of Industrija and (H3) The largest component of the equity cost in both companies is the country risk premium. The first, second and third research hypotheses are confirmed in the paper, while the null hypothesis is rejected. The total cost of capital for Holding is equal to 14,80% and the total cost of capital for Industrija is 17,10%. The main component of the cost of equity is the risk premium of investing in Serbia, which is exceptionally high and is equal to 6,40%.

INTRODUCTION

The subject of this paper is to consider the theoretical and methodological aspects of determining the cost of capital on the example of two companies from the system Energoprojekt, one of the most successful systems not only in the construction industry, but also in the entire Serbian economy. The aim of this paper is to point out the most significant theoretical and methodological problems of determining the cost of capital in general, in the conditions of underdeveloped capital market as it is in Serbia, as well as identifying the most significant determinants of those costs, not only for the observed companies, but also for the Serbian economy. In addition, since the cost of capital is determined for two companies from the same Energoprojekt system, that are similar or

comparable according to many characteristics, the aim of this paper is to indicate the degree of diversification of the activities of these two companies at the cost of their capital. Finally, pointing out the significance of the country's risk to the cost of capital of companies in Serbia, this work can also have significance for the creators of the economic and social environment and economic policy measures (Siekelova et al., 2017).

D. Watson and A. Head (2010), as well as A. Damodaran (2007), consider that the total, that is, the average weighted cost of capital (WACC) should be used as a discount rate if dynamic methods such as net present value and internal rate of return. The total cost of capital is the weighted average of the cost of capital of all long-term sources of financing, including both own and borrowed sources of financing.

When evaluating investment projects, the question arises as to how to determine the amount of the discount rate by which the future cash flows are reduced to the present value (Bogdan, 2016; Angelovska, 2016). The discount rate can be defined as the rate of return that can be achieved with the same risk in the best possible alternative (Zipovski, 2011; Androniceanu, 2017). UNIDO methodology does not prescribe a minimum discount rate, but it cannot be lower than the interest rate on borrowed funds if the project is financed from borrowed funds. If the project is directed towards the internal needs of the company, the discount rate should represent a satisfactory yield rate from the aspect of the owner (Zipovski, 2011).

The application of excessively high discount rate leads to underestimation of the present value of the expected future cash flows, while too low discount rate leads to their overvaluation. Both situations result in an inadequate investment decision with long-term negative consequences. When choosing a discount rate, it is necessary to take into account pure interest, risk and inflation (Maher, Stickney and Weil, 2012; Mentel and Brożyna, 2015). Determining the discount rate is particularly problematic in developing countries, such as Serbia, where, due to the underdevelopment of the financial market, there are no mechanisms or factors that determine this rate.

The aim of this paper is to determine the cost of the total capital of Energoprojekt Holding as one of the largest construction companies in Serbia. The special significance of this paper for theory and practice is that the CAPM model, which is considered theoretically the most correct, is used to estimate the cost of equity. In addition to establishing, financing and managing subsidiaries, the main activities of Energoprojekt Holding include corporate functions of business development, finance, procurement coordination, marketing, planning and control, legal affairs, etc. In the Energoprojekt system, four design companies (Hidroinženjering, Urbanizam i arhitektura, Entel and Industrija) and three contractors (Visokogradnja, Niskogradnja and Oprema) operate within the core activities. In addition to the companies that make up the core business, two subsidiaries operate in the system: Energodata and Garant (Energoprojekt, 2017). On the stock exchange, the shares of following four subsidiaries are traded: Industrija, Entel, Oprema and Garant, with the turnover of these shares far below the turnover of Holding's shares. Since the volume of trading in Entel, Oprema and Garant shares is insufficient to calculate the cost of capital using the CAPM model, besides the cost of the Holding's capital, the cost of the capital of the Industrija will also be calculated.

The capital asset pricing model (CAPM), developed by W. F. Sharpe (1964), assumes a linear relationship between risk and return and allows the determination of the cost of equity based on a risk-free rate of return increased by the equity risk premium (ERP). A capital equity risk premium (ERP) includes the systematic risk of investing in the company, as well as the surplus of market returns through the risk-free rate of return. Unlike the CAMP model that represents the model with one factor, Arbitrage Pricing Theory (APT), set by S. Ross (1976), assumes that instead of one, there is a whole set of betas – the one for each factor. According to this theory, the expected yield depends on how the company's response responds to a set of individual macroeconomic factors and from a premium to the risk that relates to each of these factors. Though theoretically more perfect than the CAMP model, the theory of arbitrage prices is difficult to apply in practice. E. F.

Fama and K. R. French (1992) constructed a three-factor model to determine the required rate of return on the company's shares. The first factor involves a market risk premium similar to a CAPM model, while the other two factors include the size of an enterprise measured by market capitalization and the ratio accounting to the market value of the enterprise.

E. A. Liu (2006) examine NYSE, AMEX and NASDAQ ordinary common stock for the period 1960-2003. For that research, the author develops a new asset pricing model with market factor and liquidity factor. For the period covered in the research, the new model successfully explained cross-section of stock returns. B. Hearn & J. Piesse (2009) demonstrate the importance of the liquidity factor in the asset pricing model for illiquid emerging capital markets and they suggest E. A. Liu's model for asset pricing in developing countries.

D. Collins & M. Abrahamson (2006) calculate the cost of equity in a sample of African equity markets on a sector-by-sector basis. As a risk measure, they use standard deviation, semi-standard deviation, beta and downside beta. N. Barberis, R. Greenwood, L. Jin & A. Shleifer (2015) examine consumption-based asset pricing model where some investors form beliefs about future price changes in the stock market by extrapolating past price changes, while other investors hold fully rational beliefs. The authors point out that the model is consistent with the survey evidence on investor expectations and that it captures many features of actual prices and returns. They also show that the survey evidence is consistent with the facts about prices and returns, which may be the key to understanding them.

I. Druzic, I. Stritof & T. Gelo (2012) conducted a survey of the basis of calculation of WACC on the example of the electricity and natural gas sector in Croatia. The authors have proved that the value of WACC is relatively lower because the share of borrowed resources in the capital structure is higher, as in the case of monopolistic activities (e.g. gas transmission). M. Momcilovic, S. Vlaovic Begovic & D. Zivkov (2015) calculated the cost of equity for the eight largest companies in the food industry in Serbia based on the classic CAPM and Downside CAPM models. According to the results of this study, the relatively high costs of equity in the food industry are derived primarily from the country's risk premium. J. Kocovic, M. Paunovic & M. Jovovic (2016) calculated the total cost of the capital of NIS a.d as the weighted average of the costs of equity and long-term borrowed capital, while the cost of equity was calculated using the CAPM model. The main component of the cost of equity was the investment risk premium in Serbia, which showed that strengthening of macroeconomic stability and adequate management of borrowed funds could contribute to the reduction of the total cost of equity in the oil industry of Serbia.

1. METHODOLOGY OF RESEARCH

We start this research with an explanation of the model for calculating the cost of total capital. In the continuation of this chapter, we present all the data that are necessary for calculating the cost of the total capital of Energoprojekt Holding and Energoprojekt Industrija. Considering that Holding, due to business diversification, is exposed to a lower level of risk from the Industrija, the paper starts from the research hypothesis according to which the cost of the capital of the Industrija is higher than the cost of the Holding's capital. It also starts from the hypothesis that the largest component of the equity cost in both companies has a country risk premium, while the return volatility of the shares of both companies is relatively larger than the overall market.

In accordance with the above, the following hypotheses have been formulated:

H0: The value of the beta coefficient of both enterprises is equal to zero,
H1: Volatility of the yield of shares of both companies is higher than the entire market (beta coefficient for both enterprises is greater than 1),
H2: The total cost of the Holding's capital is lower than the total cost of the capital of the Industrija,
H3: The largest component of the equity cost in both companies is the country risk premium.

1.1 Model

The total cost of capital is the weighted average of the costs of all long-term sources of financing. Given that neither Holding nor the Industrija had long-term borrowing sources of financing in the observed period, the cost of total capital is equal to the cost of the equity of these companies.

The cost of equity of these two companies is calculated using the CAPM model based on the following formula (Damodaran, 2015a):

$$K_e = R_f + \beta \times RP + CRP \tag{1}$$

where R_f represents a risk-free rate, β represents the beta coefficient of the enterprise, *RP* represents the risk premium on the mature capital market and the *CRP* country risk premium.

1.1.1 Non-Risk Yield Rate

An investment may be considered risk free if its actual yield is always the same as expected. According to A. Damodaran (2008), this is possible if there is no default risk and there is no risk of reinvestment.

The default risk involves possible financial losses for investors due to incompetence and/or unwillingness of the debtor, the issuer of financial instruments in its investment portfolio, to settle the overdue obligations (Jovović, 2015). Only the securities of some countries do not carry the risk of default. With the securities of all companies, even those of the safest, there is a risk of failure to fulfill obligations, and for that reason they can not be considered as risk free.

The risk of reinvestment is the possibility that the return on reinvested cash flows will be lower than the yield of the initial investment in the conditions of decline in market interest rates. This risk exists if, for example, we use a six-month treasury bill to estimate the expected return for a five-year period (Damodaran, 2008). Although this security guarantees the expected yield after six months, there is a risk that the interest rate will change and the yield will be different than in the first six months, when reinvesting the funds received into a new six-month government bond. This risk also exists for government bonds with coupons that have a maturity of more than one year, since coupons must be reinvested over a period of years that are not known at a given moment.

From all of the above, only long-term state zero-coupon bonds issued by developed countries, such as the United States, can be considered as risk free. The next question that arises is how maturity should have these bonds. The theoretically correct approach is to take those bonds whose maturity date corresponds to the cash flow time period of the investment project for the purpose of assessing the risk-free rate of return. For example, for estimating the discount rate that reduces to the present value of cash flows in the first year of the investment project, government bonds with a maturity of one year should be used. In order to estimate the discount rate that discounts cash flows in the second year of the project, government bonds with a maturity of two years should be used, etc.

Given that the application of this approach is complicated, in practice, only one risk-free rate of return for discounting the discount rate is used, which discounts cash flows from all years of the investment project. Accordingly, we will also use only one risk-free rate of return for the company's capital cost assessment, which is the rate of return on US government bonds with a maturity of 10 years.

1.1.2 Beta

Beta of the enterprise measures the sensitivity of returns to company shares, to changes in systematic factors that affect all companies whose shares are traded on the stock market. Thus, for example, beta of 1,2 means that if the average yield on the stock market increases by 10%, the yield on the shares of the observed company will increase by 12%. Conversely, if the average yield on the stock market decreases by 10%, the return on the company's shares will be reduced by 12%. Based on this, it can be concluded that the shares of the company, whose beta is greater than 1, bring higher yields, but also the risk, of the shares of the company whose beta is less than 1.

Beta coefficient for any enterprise is calculated by linear regression where the dependent variable represents the return on the company's shares, and the independent variable represents the market yield, that is, the yield on the stock market index that includes the shares of as many companies as possible:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_t, t = 1,2,...,T \qquad (2)$$

where $r_{i,t}$ represents the yield on the shares of the enterprise i in the period t, $r_{m,t}$ represents the yield on the stock index in the period t, α_i is the intercept on the y axis, β_i is regression coefficient or beta coefficient for the enterprise i, ε_t represents the residual, and t is the number of time periods for which the yield is calculated.

When calculating the beta, three questions are asked: which stock market index to choose, how long the time period is to calculate the beta, and how long the time interval should be selected for which the yield is calculated (Damodaran, 2007).

The rule is that one should choose the index that contains the shares of as many companies and where those shares are weighted by the market capitalization of the companies contained in the index basket. For this reason, for example, the S&P 500 index is the most commonly used case for calculating US company bets. Considering that shares of Energoprojekt Holding and Energoprojekt Industrija are traded on the Belgrade Stock Exchange, one of the Belgrade Stock Exchange Index, such as Belex 15 or Belex Line, should be selected to calculate the beta of these companies. The advantage of the Belex Line index versus Belex 15 is that it contains shares of a larger number of companies. Belex 15 contains the shares of 15 companies, while Belex Line contains the shares of 34 companies. In addition, the maximum share of the market capitalization of an individual share in the index basket is 20% for Belex 15 (Belgrade Stock Exchange, 2012b), while for Belex Line it is 10% (Belgrade Stock Exchange, 2012a), which is also the advantage of the Belex Line index. For this reason, we have decided to use the Belex Line index.

The next problem that arises is the question of the time period for which beta should be counted. Agencies involved in the analysis of companies in America are most likely to count for a period of two to five years (Damodaran, 1999). Generally speaking, the longer the time period for which beta is calculated, the greater the number of observations in the regression model, so the results are more reliable. On the other hand, if we choose too long a time period, there is a risk that the company during this period has significantly changed its business or capital structure. For this reason, a shorter time period should be chosen if it is a company that has recently emerged from a restructuring phase or has participated in merging or joining transactions with other companies. We have decided to calculate the beta of both companies for the period for the last 3 years. The main reason for such a decision is the very low turnover of the shares of the Industry in the period beyond the last three years.

Also, the problem of calculating the beta is to select the length of the time interval for which the return on the company's shares and the yield on the stock market index is calculated. The returns can be calculated on a daily, weekly, monthly, quarterly or annual basis based on the following two formulas:

$$Return\ on\ share_t = \frac{Price_t - Price_{t-1}}{Price_{t-1}}, \tag{3}$$

$$Return\ on\ stock\ market\ index_t = \frac{Index_t - Index_{t-1}}{Index_{t-1}} \tag{4}$$

where $Price_t$ represents the price of the company's shares at the end of the period, $Price_{t-1}$ represents the price of the share at the beginning of the period, $Index_t$ is the index value at the end of the period and $Index_{t-1}$ is the index value at the beginning of the period.

The time interval is shorter, the greater the number of observations in the regression model, and the results are more reliable. However, if the time intervals are too short, there is a danger that during some interval the trading of shares was not performed. If this is the case, the correlation between the return on the shares and the yield on the stock exchange index will be weaker, which will also affect the assessment of the beta coefficient. In order to avoid this possibility instead of daily or weekly intervals, we have chosen to calculate returns on a monthly basis.

1.1.3 RISK PREMIUM FOR A MATURE CAPITAL MARKET

The risk premium in the mature market represents the difference between the average yield on the shares traded on the mature market and the average yield on the risk free securities over a certain period of time. As an approximation of the average return on shares traded on the mature market, we will use the average yield on the stock index S&P 500, while we will use the rate of return on US government bonds with a maturity of 10 years, as a non-risk yield rate.

The defined risk premium requires answers to two questions: how long a period of time should be used to calculate average yields and how to calculate average yields, i.e. whether to use arithmetic or geometric mean.

The advantage of using a shorter time period for determining average yields is a lower chance of changing the attitude of the average investor towards the risk during that period. On the other hand, reducing the time period leads to an increase in the standard error in calculating the risk premium. For example, for a period of 5 or 10 years, standard errors can be almost equal to the estimated amount of risk premium (Damodaran, 2015b). For this reason, and in accordance with A. Damodaran (2015a), we have decided for the period from 1928 to 2014. This time period is taken because there are no reliable data for the period before 1928, and at the time of writing this paper, data for the period after 2014 were not available.

Average yields can be arithmetic or geometric. The arithmetic mean is used if there is no correlation between annual returns over time. However, E. F. Fama & K. R. French (1988) have shown that there is a negative serial correlation between yields to shares over the years, which leads to an overestimation of arithmetic average yields, and for this reason we have chosen to use geometric mean. Accordingly, the average yield is calculated as follows (Damodaran, 2015b):

$$Geometric\ average\ return = \left(\frac{value_N}{value_0}\right)^{\frac{1}{N}} - 1, \tag{5}$$

where $value_N$ represents the value of a stock exchange index or the price of a non-risk security at the end of the last year, $value_0$ represents the value of the stock exchange index or the price of a non-risk security at the beginning of the first year and N represents the number of years, i.e. the length of the time period for which the average yield is calculated.

1.1.4 COUNTRY RISK PREMIUM

The country risk premium reflects specific economic, political and social conditions as risk factors in the country in which the investment project is implemented or in which the observed company operates (Marthinsen, 2014). According to A. Damodaran (2015a), the country risk premium is calculated as follows:

$$CRP = CDS \times \frac{\sigma_E}{\sigma_B},$$ (6)

where the CRP represents the country risk premium, the CDS country default spread, σ_E the standard deviation of the average yield on the shares of all enterprises in the country (standard deviation of the yield on the stock exchange index) and σ_B standard deviation of yields on government bonds of the country.

In our case, the CDS represents the difference between the interest rate on government bonds of the Republic of Serbia and the interest rate on government bonds of the country whose government bonds are considered as risk free. It is important to note here that state bonds of the two countries must have the same maturity date and have to be denominated in the same currency in order to exclude the effect of inflation on their yield. As the government bonds of the Republic of Serbia are denominated in euros or in dinars, the CDS represents the difference between the interest rate on German government bonds and interest rates on government bonds of the Republic of Serbia, denominated in euros with the same maturity. The Republic of Serbia did not issue government bonds denominated in dollars, therefore for this reason German government bonds, not American, are used to calculate the CDS.

As an approximation of the average yield on the shares of all companies in the Republic of Serbia, the Belex Line stock exchange index is used, so σ_E in fact represents the standard deviation of the yield on the stock exchange index Belex Line over a certain period. For the calculation of standard deviation, weekly indexes for the period of the last two years are most often used (Damodaran, 2015a).

In order to determine the standard deviation of yield on state bonds of the Republic of Serbia, σ_B, we also use weekly returns over the last two years (Damodaran, 2015a). We also take ten-year government bonds denominated in euros, because we have opted for a risk-free rate of return on US government bonds with a maturity of 10 years.

2. DATA

Data on market capitalization and long-term liabilities of the company, on December 31, 2016, were taken from the Belgrade Stock Exchange website. The data are presented in Table 1.

Table 1. Relevant data for Energoprojekt

Data on December 31, 2016	Holding	Industrija
1. Number of shares issued	10.931.292	197.310
2. Price of share (RSD)	1431	2300
3. Market capitalization (RSD) (1x2)	15.642.678.852	453.813.000
4. Long-term liabilities (RSD)	0	0
5. Share of equity in the company's total long-term capital	100%	100%

Source: Belgrade Stock Exchange, 2017.

The rate of return on US government bonds with maturity of 10 years, on January 4, 2017, is 2,46% (Table 2). In our model, this rate was used as a non-risk yield rate.

Table 2. US Treasury yield curve rates (%)

Date	3 months	6 months	1 year	2 years	3 years	5 years	7 years	10 years	20 years
04.01.2017.	0,53	0,63	0,87	1,24	1,50	1,94	2,26	2,46	2,78

Source: US Department of Treasury. (2017). Daily Treasury Yield Curve Rates. Retrieved from: https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yieldYear&year=2017_ (January 4, 2017).

Monthly returns on Holding and Industry shares and the Belex Line stock index were calculated on the basis of share price data and the level of the stock exchange index for the period from January 3, 2014 to January 4, 2017. These data are also taken from the Belgrade Stock Exchange website. Table 3 shows descriptive statistical indicators for the shares of two companies and the Belex Line index.

Table 3. Descriptive statistics for the companies' shares and the Belex Line index during the period from January 3, 2014 to January 4, 2017.

	Holding share price	Industrija share price	BELEX line value	Holding monthly yield	Industrija monthly yield	Belex line monthly yield
Arithmetic mean	1.031	1.540	1.327	2,03%	3,03%	1,03%
Median	986	1.419	1.340	2,06%	0,00%	0,99%
Standard deviation	181	421	111	7,15%	19,43%	3,11%
Minimum	738	1.199	1.120	-11,20%	-14,21%	-8,91%
Maximum	1.412	2.491	1.569	17,67%	107,76%	6,33%
Range	674	1.292	449	28,87%	121,97%	15,24%

Source: Belgrade Stock Exchange, 2017.

As can be seen from Table 3, the average yield on Holding's shares over the three-year period was 2,03%, while in the case of the v it was 3,03%. The average yield on the stock exchange index Belex Line was 1,03%. However, the prices of the shares of both companies changed significantly, which resulted in very high positive and negative returns in some months. Shares of Holding achieved the highest positive yield in March 2014 (17,67%), while the lowest negative yield was realized in June 2015 (-11,20%). Shares of Industrija achieved the highest positive yield in July 2016 (107,76%), while the lowest negative yield was realized in February 2016 (-14,21%). From this it can be seen that the shares of the Industrija are more volatile than Holding's shares.

A. Damodaran (2015b) calculated the risk premium in the US as the difference between the average yield on the stock index S&P 500 and the average yield on government bonds for different periods of time using the geometric and arithmetic mean (Table 4). In our model, the risk premium in the mature market is 4,60% and it represents the difference between the geometric average yield on the stock index S&P 500 and the geometric average yield on government bonds with a maturity of 10 years for the period from 1928 to 2014.

Table 4. Risk premium on a mature capital market (US market)

Period	Arithmetic mean		Geometric mean	
	Shares – T. Bills	Shares –T. Bonds	Shares – T. Bills	Shares –T. Bonds
1928-2014	8,00%	6,25%	6,11%	4,60%
1965-2014	6,19%	4,12%	4,84%	3,14%
2005-2014	7,94%	4,06%	6,18%	2,73%

Source: Damodaran, A. (2015b). Equity Risk Premiums (ERP): Determinants, Estimation and Implications - The 2015 Edition. New York University - Stern School of Business. Retrieved from http://pages.stern.nyu.edu/~adamodar/New_Home_Page/papers.html, p. 30.

According to A. Damodaran (2017), the risk premium for investing in Serbia (Country risk premium) is 6,40%.

3. RESULTS AND DISCUSSION

All calculations were done in the Microsoft Excel 2013 and Stata/IC 13 software. Tables 5, 6 and 7 show the results of the regression analysis performed in the Stata/IC 13 statistical software. The estimated value of the beta coefficient for Holding is 1,291 and for Industry 1,791.

Table 5. Results of regression analysis

Results	Holding	Industry
Number of observations	36	36
F (1, 34)	15,63	3,04
Probability > F	0,0004	0,0901
Coefficient of Determination (R-squared)	0,3149	0,0822
Adjusted Coefficient of Determination (Adj R-squared)	0,2948	0,0552
Standard error of regression (Root MSE)	0,06007	0,18884

Source: author's calculations

Table 6. Beta coefficient for Energoprojekt Holding

Holding monthly yield	Coefficient	Standard error	t	P>|t|	95% Confidence interval	
Belex line monthly yield	1,291095	0,3265918	3,95	0,000	0,6273804	1,954809
Constant	0,0069918	0,0105596	0,66	0,512	-0,014468	0,0284516

Source: author's calculations

Table 7. Beta coefficient for Energoprojekt Industrija

Industrija monthly yield	Coefficient	Standard error	t	P>|t|	95% Confidence interval	
Belex line monthly yield	1,790927	1,026612	1,74	0,090	-0,2953992	3,877254
Constant	0,0118756	0,0331933	0,36	0,723	-0,0555812	0,0793325

Source: author's calculations

The P-value for the Holding's beta coefficient is zero, which means that we can reject the null hypothesis according to which the beta coefficient is zero. In support of this is the F test; given that F statistics is at a fairly high level (15,63). However, the P-value for the Industry's beta coefficient is 0.09, which means that with a probability of a 9% error, we can reject the null hypothesis according to which the beta coefficient is equal to zero. This conclusion can also be made on the basis of T statistics (1,74), which is higher than T statistics for level of significance of 10% and 34 degrees of freedom (1,691). The relatively low level of significance of the Beta coefficient for the Industry is a consequence of a small number of transactions on the stock exchange, which significantly reduces the reliability of this analysis. F statistics for Industry is also at a low level (3,04).

The standard error for the beta coefficient of the Holding (Industrija) is 0,327 (1,027), which means that with a probability of error of 5% we can conclude that the actual beta coefficient for the entire population (the period from when companies went on the stock market to the present) is in the interval from 0.627 to 1.955 for Holding, or from -0.295 to 3.877 for Industrija. This is a very wide interval, especially for Industrija. Since we are not interested in the beta coefficient for the entire population, but for a more recent period, for which we are sure that the company's business has not changed significantly, a high level of standard error is not a problem.

Figure 1. Diagram of Dispersion of the Monthly Yield of the Holding's Shares
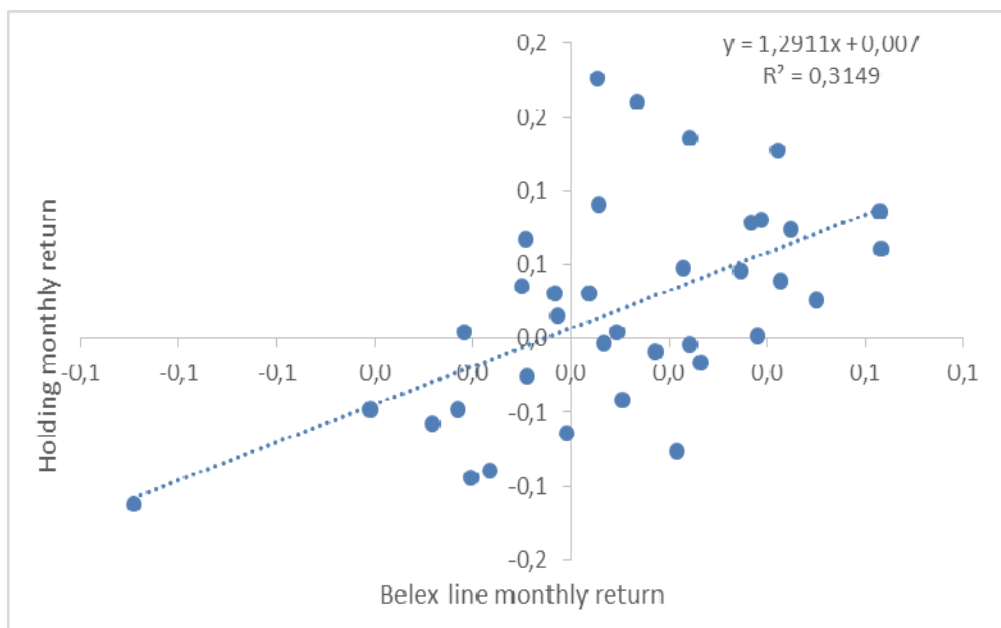
Source: author's calculations

Figure 2 Diagram of Dispersion of Monthly Yield of the Industrija's Shares
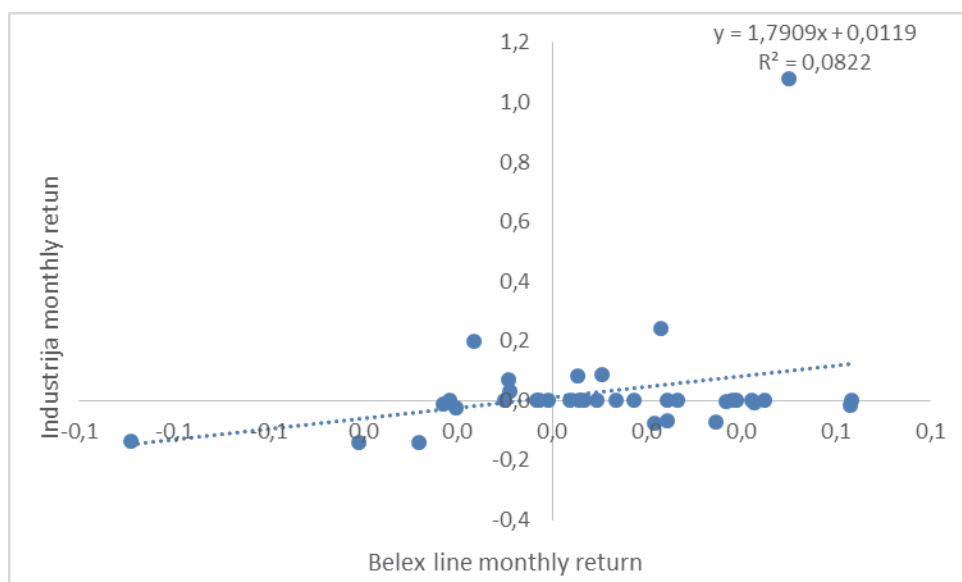
Source: author's calculations

However, what adversely affects the ability to anticipate a change in yields on the company's shares based on a change in yield to the stock index is a very low coefficient of determination for Industrija that is 0,082 and 0,055 if we look at the adjusted R-squared. In the case of Holding, this coefficient is at a significantly higher level (0,315 and 0,295 if we look at the adjusted R-squared). This coefficient measures how much the variation of monthly yields on the stock exchange index Belex Line explains the variation in monthly returns on the shares of two companies. Figure 1 and Figure 2 show the dispersion of monthly yields relative to the regression line.

Although it would be better if the coefficient of determination is higher, especially in the case of the Industrija, according to Figure 1 and Figure 2, a positive correlation between the yield on the shares and the yield on the stock market index can be clearly seen. In Figure 2 it can be noticed that a large number of points are on x axis. The reason for this is a low liquidity of the shares of the Industrija, which caused the price of the shares of this company to not change and after a few months, therefore, the yields on the shares in certain months were equal to zero.

The Beta coefficient of 1,291 for Holding, and 1,791 for Industry indicate that the shares of these two companies can be considered offensive. Such shares are attractive to investors in times when stock market prices are on average rising. The reason for this is the fact that if the average yield on the shares of all companies in Serbia, measured by the stock market index Belex Line, increased by 10%, the yield on the shares of these two companies would increase by a greater percentage, i.e. by 12.91% or by 17.91% (Watson and Head, 2010). This confirms the first re-search hypothesis according to which the return volatility of the shares of both companies is great-er than the overall market.

However, when drawing such a conclusion, a certain reservation should be made. First, Belex Line, although the most comprehensive stock exchange index in Serbia, does not contain shares of all companies, but only 34. Second, the share of market capitalization of Energoprojekt Holding in the Belex line is 10%, which is an extremely high percentage. The reason for this is the underde-veloped capital market in Serbia with a small number of companies whose shares are traded on the stock exchange. The share of the market capitalization of Energoprojekt Industrija in this index is much smaller and amounts to 0,55%. Finally, the volume of trading in shares of both companies

is very small. Holding shares are traded almost every day, while the shares of the industry are traded much less often, sometimes less than once a week. Unfortunately, the same is the case with the shares of most other companies in Serbia.

By applying the formula given by the expression 1, the cost of equity for Holding and Industrija, is calculated. The results are shown in Table 8.

Table 8 The cost of equity for Energoprojekt Holding and Energoprojekt Industrija

	Holding	Industrija
1. Non-risk yield rate	2,46%	2,46%
2. Beta coefficient	1,291	1,791
3. Risk premium on a mature capital market	4,60%	4,60%
4. Country risk premium	6,40%	6,40%
5. Cost of equity (1+2*3+4)	14,80%	17,10%

Source: author's calculations

Given that both Holding and Industrija do not have long-term debt and that the total cost of capital represents the weighted average cost of all long-term sources of financing, the cost of total capital is equal to the cost of equity of these two companies. The total cost of capital for Holding is 14,80%, while the total cost of capital for Industrija is 17,10%. This confirms another research hypothesis according to which the total cost of the Holding's capital is lower than the total cost of the capital of the Industrija. It can also be noted that the only difference in the cost of the capital of these two companies is the beta coefficient, which is higher for Industrija compared to Holding. Given that the beta coefficient represents a measure of non-systematic risk of the company, it can be concluded that the main reason why the Industrija has a higher beta in relation to Holding is the fact that Holding is exposed to a lower level of risk from the Industrija due to business diversification. This conclusion should be taken with a certain margin of reserve, bearing in mind the low trading volume of these two companies, and in particular the shares of the Industry.

As can also be seen, the main component of the cost of equity is the premium for investment risk in Serbia, which is extremely high, amounting to 6,40%, thus confirming the third research hypothesis. This result is consistent with the results of M. Momčilović et al. (2015), as well as J. Kočović et al. (2016). For comparison, the investment risk premium in Montenegro is also 6,40%, for Croatia 4,27%, Hungary 3,13%, Slovenia 3,13%. The only country in the region with a higher premium than Serbia is Bosnia and Herzegovina (9,25%) (Damodaran, 2017).

The determined total cost of capital can be used as a discount rate, if dynamic methods are applied for the evaluation of investment projects, such as the net present value and internal rate of return.

CONCLUSION

The paper presents the theoretical and methodological aspects of determining the cost of capital in the case of the Energoprojekt system. The total cost of the capital of Energoprojekt Holding and Energoprojekt Industrija was calculated, representing the weighted average cost of capital of all long-term sources of financing. Bearing in mind that neither Holding nor the Industrija have long-term borrowing sources of financing, the cost of total capital is equal to the cost of equity of these two companies. The cost of equity was calculated using the CAPM model, which, despite all

of its limitations shown in this paper, continues to be theoretically the most correct and often used model in practice. Accordingly, the rate of return on US government bonds with a maturity of 10 years was used as a non-risk yield rate. The Beta coefficient is calculated on the basis of liner regression where the dependent variable represents the return on the company's shares, and the independent variable market yield, that is, the yield on the stock market index Belex Line. The returns are calculated on a monthly basis for a period of three years.

As a risk premium in the mature market, we took the difference between the average yield on the stock index S&P 500 and the average yield on US government bonds with a maturity of 10 years. We used the geometric mean for the period from 1928 to 2014. The country risk premium is the country default spread (the difference between the interest rate on the risk-free (German) government bonds and the interest rates on government bonds of the Republic of Serbia, denominated in euros with the same maturity), corrected by the ratio of the weekly yield volatility to the Belex Line index and volatility of the weekly yield of government bonds, observed over the last two years.

The conducted analysis shows that the cost of equity of Holding is 14,80%, while the cost of equity of the Industrija is 17.10%. The first, second and third research hypotheses were confirmed in the paper, while the null hypothesis was rejected. The volatility of the shares of both companies is higher than the total market (the beta coefficient for both enterprises is greater than 1), the cost of the Holding's capital is lower than the cost of the capital of the Industrija, and the main component of the equity cost of both companies is the premium for the investment risk in Serbia, which is extremely high and amounts to 6,40%.

The obtained results point to the possible directions of lowering the cost of capital not only for these two companies, but also for all companies operating in Serbia. The precondition for lowering the cost of equity is the improvement of the macroeconomic environment, through the establishment of economic, monetary and political stability, the development of the financial market, the eradication of corruption, the attraction of foreign direct investments, the protection of legal property and the rule of law. This will lead to an increase in the present value of future cash flows that will, in the case of an efficient capital market, positively affect the price of shares and the market capitalization of the company.

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