USING THE CAPM MODEL TO ESTIMATE THE PROFITABILITY OF A FINANCIAL INSTRUMENT PORTFOLIO

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ABSTRACT: The main objective of equity investors is the capitalized value of future benefits. In this regard, most of the time, these investors prefer to build portfolios of financial instruments. This requires the creation and permanent adaptation to the demands of the modern economy of models designed to ensure a much easier management of these portfolios of financial instruments. CAPM model provides a relatively accurate prediction of the relationship that exists between a financial risk and the expected return (yield). The usefulness of the model lies in the fact that, on the one hand it offers the possibility of comparison of different variants of placement in the financial markets and, on the other hand, justifies the estimate on the scientific basis of the expected future value of profits generated by a financial instrument. The core of the CAPM model is represented by the beta coefficient which measures the sensitivity of the financial instrument in relation to the systematic risk.

Keywords: CAPM model, the systematic risk, specific risk, beta volatility coefficient, anticipated profitability

JEL Codes: G11, G17

Introduction

The stock market is a fundamental component of any national economic system; it is intended to provide the necessary capital transfer between holders of financial resources and the entities willing to draw these resources and to provide in exchange a range of financial instruments.

The evolution of the current economy, characterized by an increase in the complexity and intensity of all its features, has generated more and more often the need for creation of applications designed to ensure a reflection as fair as possible of the different situations that may occur in daily activity, as well as the favorable or unfavorable influences they can have on the entire system. These findings led to the researchers' concern to develop models to ensure accurate coverage of the relations existing between the various developments of human life-in general-and of its economic aspects, in particular.

Literature review and conceptual framework

CAPM model represents a qualitative leap in financial theory from normative patterns from a pattern of balance between supply and demand of risky assets that generate unique prices of financial assets. Portfolio selection model, known in literature as the Capital Asset Pricing Model (CAPM) is one of the reference models of modern portfolio theory that has been proposed, studied and developed by a number of renowned specialists in the field (Sharpe, 1964; Lintner, 1965; Mossin, 1966).

CAPM model adjusted to the size of the company (Banz, 1981), is meant to eliminate the absence of the influence of the listed companies dimensions on the estimated yield of its issued securities. In his studies, Banz, who is also the author of this model, has showed that the size of the

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residual profit explains the expected variations much better than beta. Other authors (Chen and Ang, 2007) carried out an x-ray of the evolution over time of the CAPM model, insisting on the possibilities of adapting it to the requirements of the modern economy and to minimize investment risks. On further research, the two researchers together with another specialist (Chen et al, 2006) have published a study that examines the relationship between the evolution of market risk and the level of benefits expected by portfolio investors.

In 2002, the University of Southern Mississippi, the USA, (Hsieh *et al,* 2002) has developed and published a study in which they propose the implementation of a model for the selection of financial securities which compose a portfolio, to take into account, firstly, the rate of inflation (*Inflation-Hedge Stock Investment Portfolio Model-IHSI*). This study begins with the specific models of modern portfolio theory, introducing the idea that the analysis of the benefits obtained as a result of financial investments should be at least equal to the forecast inflation rate plus a certain share in the profits. Also, the CAPM model influence on the capital market of the United States of America is the basis of the analysis made by renowned specialists (Fama and French, 2006) which demonstrates that the model mentioned above is depended on the specific circumstances of the capital market within a specified period of time.

In more than four decades after the occurrence, although it continues to be at the centre of debate, being alternately criticized and partially validated, CAPM model is still widely used in applications, such as estimating the cost of capital for companies that manufacture or performance appraisal of financial instrument portfolios. With regard to the specific risk, some recent tests (Fang and Peress, 2009) have shown that the titles recording a high risk provide lower yields, while other specialists (Fu, 2009) have achieved a positive relationship between yields and specific risk. Some authors (Chou *et. al,* 2012) found seasonality in profitability and a "*size effect*" significantly only for companies with a market capitalization below average the industry, others (van Dijk, 2011), after a review of numerous studies in recent decades, highlight its blur effect, while (Grauer and Janmaat, 2009) obtaining pro-CAPM evidence.

Methodology of research

Given the fact that, from its appearance and so far internationally numerous studies have been undertaken to test the validity of the CAPM model, however, very few are those who have targeted the capital market in Romania. Accordingly, the objective of this article is just an empirical study to demonstrate whether the CAPM is a viable one, namely to respond to the following questions:

1. Is the expected Rate of return for a title in a linear relationship with its sensitivity indicator Beta?
2. Will lower risk\higher entail lower\higher profitability?
3. Does the specific risk affect the yields of financial instruments or portfolios of financial instruments, the CAPM model argues that only systematic risk can explain to some extent the yield?

General issues relating to Capital Assets Pricing Model

The model developed by Sharpe is a result of the fluctuations of securities which were influenced both by changes in the general index of the stock exchange, as well as the specific changes to the issuing companies.

In this respect, it is considered that the total variance of a financial basis is due to simultaneous action of two broad categories of risks, namely:

- Systematic risk (market risk, not diversifiable) that occurs as a result of variations of main macroeconomic indicators (gross domestic product, inflation rate, interest rate, exchange rate, etc.), but also the social-economic conditions and the specific policy of each country.
- Specific risk, determined solely by the characteristics of each financial instrument and that, in turn, can be broken down into:

- A sectoral risk (specific to the sector of activity to which the issuer of the financial instrument belongs);
- A specific intrinsic risk (determined by the real economic situation of the issuer of securities).

In drafting its model, William Sharpe was the one who introduced in the portfolio of risky assets, a risk-free asset in different combinations in relation to risk of the investor's portfolio. This led him to a new frontier of efficiency, with a particular form: that of a line, known as the Capital Market Line (Sharpe, 1963). The equation of CML is:

$$E_p = R_f + \frac{E_M - R_f}{\sigma_M} \cdot \sigma_p \quad (1)$$

CAPM model equation to measure the average profitability of a portfolio of risky assets, Ep, starting from:

• title risk-free rate R_f (constant exogenous and financial market, as a rate of return on money market);

• the anticipated market average profitability E_M;

• the risk of title in relation to σ_M square or the unit price of risk in the market. It is, in fact, slope CML (σ_M represents the market risk);

• portfolio risk σ_p.

The analysis of markets, Sharpe has introduced the idea of the market portfolio, containing one of each title, the weighting being made according to the ratio between the market value of each title and the total value of the market. Thus, the efficiency of CAPM model, along with the identification of the right by CML, consists in determining the linear relationship between profitability and hoped for the amount of systematic risk assumed by an investor buying a title (Sharpe, 1964). This relationship is right SML (Security Market Line):

$$E_i = R_f + (E_M - R_f)\, \beta_i, \quad (2)$$

Where:

E_i = the expected profitability of the title;

Rf = the risk-free rate;

EM = the early return of the market;

Bi = coefficient of volatility of the title in relation to the market.

This relationship shows that the hope of a financial return consists of the risk-free rate plus a risk premium. The first risk is equal to the product of the difference between the average yields of market and hoped the rate without risk and volatility coefficient.

Beta is an indicator that is calculated for each title individually, depending on the risk of that title to market risk. The interpretation of this indicator is relatively simple:

• If beta = 0, the title is without risk,

• If beta = 1, the title has the same risk with market (neutral). In this case, the average profitability of the stock market registers a change of one percentage point, then the expected yield of the title is the same size;

• If beta < 1 title is less risky than the market (a little volatile, quietly). In this context, the variance with one percentage point of the average return of the stock market attracts a smaller variation of the hope of return title;

• If beta > 1 title is more risky than the market (a volatile, aggressive). Thus, changes in the average profitability of the market with a percentage point rise to a change in the expected yield of the title by more than one percentage point.

According to the interpretation of this coefficient, we have both positive and negative values. βi is the volatility of the title "i" and is determined based on the following relationships:

$$\beta_i = \frac{\sigma_{iM}}{\sigma_M^2} \qquad (3)$$

but, whereas

$$\sigma_{iM} = \rho_{iM} \cdot \sigma_i \cdot \sigma_M \Rightarrow \beta_i = \frac{\rho_{iM} \cdot \sigma_i \cdot \sigma_M}{\sigma_M^2} \Rightarrow \beta_i = \frac{\rho_{iM} \cdot \sigma_i}{\sigma_M}$$

Covariation of the title of "i" and "M" (σ_{iM})

$$\sigma_{iM} = \frac{1}{T-1} \cdot \sum_{t=1}^{T} (R_{i_t} - \bar{R}i)(R_{M_t} - \bar{R}M) \qquad \sigma_M^2 = \frac{1}{T-1} \cdot \sum_{t=1}^{T} (R_{M_t} - \bar{R}_M)^2$$

Where:
t = 1... T (number of observations in time upon profitability rates);
R_{it} = the profitability of the title "i" at the time "t";
R_{Mt} = the profitability of the market at the time "t";
$\bar{R}i$ = average profitability of the title "i";
$\bar{R}M$ = average profitability of the market.

$$R^2 = \rho^2 = \beta^2 \frac{\sigma_M^2}{\sigma_i^2}$$

The covariation of the title of "i" and "j"(σ_{ij})

$$\sigma_{ij} = \frac{1}{T-1} \cdot \sum_{t=1}^{T} (R_{i_t} - \bar{R}i)(R_{j_t} - \bar{R}j)$$

t = 1.. T (number of observations in time upon profitability rates);
R_{it} = the profitability of the title "i" at the time "t";
$\bar{R}i$ = average profitability of the title "i";
R_{jt} = the title's profitability "j" at the time "t";
$\bar{R}j$ = the title's average profitability "j".

Dispersion σ_i^2

$$\sigma_i^2 = \frac{1}{T-1} \cdot \sum_{t=1}^{T} (R_{i_t} - \bar{R}_i)^2$$

The correlation coefficient ρ_{ij}

$$\rho_{ij} = \frac{\sigma_{ij}}{\sigma_i \cdot \sigma_j} \Rightarrow \sigma_{ij} = \rho_{ij} \cdot \sigma_i \cdot \sigma_j \qquad \rho = \beta \frac{\sigma_M}{\sigma_i}$$

Beta coefficient measures the profitability of sensitivity in relation to the average profitability of the market, as follows:

$$\beta_i = \frac{\partial E_i}{\partial E_M} \qquad (4)$$

CAPM model equation is therefore a linear equation; you get right by placing all the securities in the market on a graph of the yield on risk-leading to obtaining the right by CML. In this context, the Beta can be thought of as a security risk if the CAPM model. Risk measurement based on a title, you can calculate the risk of a combination of N non-weighted sum of the beta, depending on the structure of this portfolio.

$$\beta_p = \sum w_i \beta_i \qquad (5)$$

In the period which has elapsed since its creation, the CAPM model has undergone a series of adaptations to the actual conditions of the capital market in this respect is worth noting the following developments of this model:

• *CAPM model adjusted to transaction costs*

This model was developed to eliminate one of the main shortcomings of Capital Assets Pricing Model i.e., exclusion from analysis on the impact on the cost of trading profits. These costs exist and sometimes through their importance can significantly affect investors ' investment decision. Transaction costs can take various forms, such as expense, commissions, margin deposited at broker etc.

• *CAPM model adjusted to the size of the company*

Rolf Banz (1981) has designed this model aimed at the removal of the CAPM model lack the influence of entities listed on the estimated yield of securities issued by them. As a result of investigations carried out, Banz proved that the size of the company has a particular significance and justify the residual profit expected variations in a way more eloquent than beta.

• *CAPM model adjusted to the level of taxation*

The taxation is another variable that needs to be taken into account in financial investments. Differentiated taxation shall apply to different categories of securities, investment behavior depending on this factor significantly influence. Taxation level not only affects the placement decision, but also the financial structure of companies

- on the market (through direct impact on the cost of capital). Studies have shown that the taxes imposed on the dividends or interest has an impact on the relationship;

- risk of linearity and gain, in contrast, taxation on capital gains would not have an effect on the CAPM.

Construction of a financial instrument portfolio issued by companies listed on the Bucharest Stock Exchange

Any portfolio construction starts with the identification of the financial instruments that are to be traded, as well as the preparation of the moment opportune for entering capital market (i.e. the optimal timing of trading). This is the stage in which it carries out market analysis with the aim of collecting the necessary information in the decision-making process of investment. In this regard, it is recommended that investment activity to be based on a thorough evaluation of both the individual performance of the instruments to be purchased, as well as to the overall evolution of the stock market you are going to be made investing.

In pursuit of this research, I set up a portfolio consisting of shares issued by companies in our country that are traded through the stock exchange. In order to identify financial instruments to be traded, I use fundamental analysis based on the rate of liquidity, solvency rate, rate of return and the market rate. In this regard, we have paid ratings the following criteria (Anghel, 2013):

FB	B	S	I
3	2	1	0

I have also underlined the importance of each indicator and set the following weights:

Indicator	Liquidity	Solvency	Profitability	Market rates
Weight	30%	30%	20%	20%

Source: Own calculations

These weights are based on the following logical argument: liquidity is a key indicator in the analysis of a company, as a result I am granted a share of 30%; If the company is liquid, generally it is solvent, which is why the allocated share is 30%; in a situation where a company is solvent and liquid, with the certainty that conducts counterterrorism-for this reason we have devoted a smaller share of 20%. An element is represented by the value of the shares on the market whereas the gain is achieved as a result of their share of 20% is granted.

$$\text{The weighted score obtained} = 0{,}3 \cdot \text{Weight liquidity} + 0{,}3 \cdot \text{Weight solvency} + 0{,}2 \cdot \text{Weight profitability} + 0{,}2 \cdot \text{Weight market rate}$$

Financial instruments in order to identify what will be part of the portfolio; we have submitted a number of fundamental Analysis 20 companies listed on the Bucharest Stock Exchange, of which shares are traded in the primary market, REGS, both in the category of financial instruments and in the II (table 1). The analysis was based on the information contained in the consolidated accounts, the balance sheet and the profit and loss account in the period 2010-2012. The companies selected to be analyzed are part of a wide range of views of the industry as a diversified portfolio across multiple sectors of the economy will be less risky than a portfolio that includes titles from a single branch.

Table no. 1.

Companies subject to financial analysis

No.	**Name of the company**	**Area of activity**	**Symbol**	**Categories**
1.	Aerostar S.A.	Manufacture of aircraft and spacecraft	ARS	II
2.	Alro. S.A.	Aluminium	ALR	I
3.	Antibiotice S.A	Manufacture of basic pharmaceutical products	ATB	I
4.	Bermas S.A.	Brewing	BRM	II
5.	Boromir Prod S.A. Buzau (Spicul)	Manufacture of bread; manufacture of cakes and fresh pastry products	SPCU	II
6.	Calipso S.A. Oradea	Bars and other beverage serving activities	CAOR	II
7.	Electromagnetica S.A. Bucureşti	Manufacture of instruments and appliances for measuring, checking, control, navigation	ELMA	I
8.	Omv Petrom S.A.	Crude oil extraction	SNP	I
9.	Prodplast S.A.	Development of plastic products	PPL	II
10.	Sif Muntenia S.A.	Other financial intermediation n.e.c.	SIF 4	I
11	C.N.T.E.E. Transelectrica	Electricity transport	TEL	I
12.	S.N.T.G.N. Transgaz S.A.	Transport by pipeline	TGN	I
13.	Turism Felix S.A. Băile Felix	Hotels and other similar facilities	TUFE	II
14.	Brd - Groupe Societe Generale S.A.	Monetary intermediation activities	BRD	I
15.	Banca Transilvania	Monetary intermediation activities	TLV	I
16.	Banca Comercială Carpatica S.A.	Monetary intermediation activities	BCC	I
17.	Sif Banat Crişana S.A.	Other financial intermediation n.e.c.	SIF 1	I
18.	Sif Oltenia S.A.	Other financial intermediation n.e.c.	SIF 5	I
19.	Biofarm S.A.	Manufacture of pharmaceutical preparations	BIO	I
20.	Farmaceutica Remedia S.A.	Wholesale of pharmaceutical products	RMAH	II

Source: Own systematization

Depending on the values of the indicators compiled, I grant the corresponding score described above, we have calculated the weightings for the final weighted score resulting in the total obtained by each company. The results are presented in the following table (table 2):

Table no. 2.

The companies analyzed depending on the score obtained

No.	Company	2010	Company	2011	Company	2012	Company	Total
1.	SIF 4	6.90	BCC	7.50	ELMA	7.60	ELMA	21.30
2.	SIF 1	6.70	BRM	7.40	SNP	7.60	SNP	21.30
3.	ELMA	6.60	TUFE	7.10	SPCU	7.10	BRM	20.70
4.	SNP	6.30	ARS	6.90	TEL	7.10	TGN	19.80
5.	TUFE	6.30	RMAH	6.20	TUFE	7.10	TUFE	19.10
6.	BRM	6.30	ELMA	6.00	SIF 5	7.10	SIF 5	19.10
7.	TGN	5.90	SPCU	6.00	TGN	7.00	SPCU	18.90
8.	SPCU	5.80	SIF 5	5.90	BRM	6.90	SIF 4	18.70
9.	SIF 5	5.80	SIF 1	5.80	PPL	6.60	TEL	18.30
10.	ALR	5.50	TEL	5.70	BIO	6.50	BIO	17.40
11.	ARS	5.50	BRD	5.70	ATB	6.20	PPL	17.20
12.	TEL	5.30	TGN	5.60	SIF 1	6.00	ATB	17.00
13.	BIO	5.20	SIF 4	5.30	RMAH	5.90	ARS	16.50
14.	ATB	5.0	TLV	5.30	SIF 4	5.80	ALR	15.90
15.	PPL	5.0	ALR	5.10	ARS	5.70	RMAH	15.10
16.	CAOR	4.40	SNP	4.20	ALR	5.30	SIF 1	14.70
17.	RMAH	3.90	ATB	3.70	CAOR	4.80	CAOR	13.40
18.	BRD	3.40	BIO	3.40	TLV	3.70	TLV	10.80
19.	TLV	3.40	CAOR	2.00	BRD	2.40	BRD	9.20
20.	BCC	3.30	PPL	1.50	BCC	2.40	BCC	7.20

Source: Own calculations

The decision on inclusion or non-inclusion of the shares in the portfolio to be built is based on weighted score obtained, being selected a number of 10 shares. As I also stated in the decision establishing the number of components in the structure of the securities portfolio is made by the investor, but it is recommended to take into account the opinion of the specialists in the field say that it must be a minimum of 7 to compensate for variations in the efficiency of these titles and 14-15 titles for the models used to produce reliable results. Based on these issues, we have decided that the portfolio should be comprised of 10 shares.

Considering that banking companies analysis was done after other indicators than the other companies analyzed it obtained scores are not comparable. Taking into account this fact (table 3), and the desire for inclusion in the portfolio and a Bank, I selected the Bank that received the highest total score, the Seawolf. As can be seen, Transilvania Bank is not in the top 10, so for it to be included in the portfolio, another company should be excluded. The decision on expulsion was based and from this time on financial criteria and we decided on its removal S.C. Boromir S.A. whereas decreased profit in 2011 compared to 2010 of 83.91%. Although 2012 has seen a spectacular comeback with a net total increase in profits, compared to the year 2011, of 132.18%, the amount recorded in the current year of 1177362.00 lei is well below the level of the year (3150845.00 lei).

Table no. 3

Selected companies whose shares are part of the portfolio of financial instruments

No.	Company	Symbol	Category	Weight
1.	ELECTROMAGNETICA	ELMA	I	21.3
2.	OMV PETROM	SNP	I	21.3
3.	BERMAS	BRM	II	20.7
4.	TRANSGAZ	TGN	I	19.8
5.	TURISM FELIX	TUFE	II	19.1
6.	SIF OLTENIA S.A.	SIF5	I	19.1
7.	SIF MUNTENIA	SIF4	I	18.7
8.	TRANSELECTRICA	TEL	I	18.3
9.	BIOFARM BIO	BIO	I	17.4
10.	BANCA TRANSILVANIA	TLV	I	10.8

Source: Own calculations

Application of CAPM model for portfolio building

Predicting future yields of the securities included in the portfolio using the CAPM

In this part of the paper, we used the model of evaluation of financial assets of CAPM in order to estimate yields of the securities included in the portfolio. To this end, we analyzed the situation in which the market quote and unrisky assets, namely bonds. So, we used the risk-free interest rate-the interest rate for the bonds with interest information that was taken from statistics available BNR website (www.bnr.ro). Whereas it is proposed to be used in the analysis of average daily interest rate, and the available information relates to the annual rate of interest, it is obtained using the following relationship:

$$(1+\text{rate}_{\text{daily}}) = (1+\text{rate}_{\text{daily}})^{365} \qquad (6)$$

Where it appears that the daily interest rate without risk is equal to:

$$\text{rate}_{\text{daily}} = \sqrt[365]{1+rate_{daily}} - 1$$

Testing the first stage model implies estimating coefficients β for each individual (β_i).

$E_i = R_f + \beta_i \cdot (E_M - R_f)$; $\quad E_i - R_f = \beta_i \cdot (E_M - R_f)$

$$\beta_i = \frac{\sigma_{iM}}{\sigma_M^2} \qquad (7)$$

Beta coefficients for each title in hand, the rates of return of each title covariation with those of the stock market, and the market's general index dispersion of titles is listed in the following table (table 4):

Table no. 4.

Specific actions analyzed Indicators

	β_i	σ_{iM}	σ^2_M	σ^2_i	σ_i	R^2	ρ_i
ELMA	0.746011	0.000081	0.000108	0.000562	0.023707	0.107018	0.327136
SNP	1.047695	0.000113	0.000108	0.000221	0.014866	0.537266	0.732984
BRM	0.349496	0.000038	0.000108	0.000922	0.030364	0.01431	0.119625
TGN	0.657102	0.000071	0.000108	0.000191	0.013820	0.244675	0.494646
TUFE	0.658793	0.000071	0.000108	0.001036	0.032187	0.045245	0.212708
SIF5	0.994074	0.000107	0.000108	0.000257	0.016031	0.414816	0.644062
SIF4	0.762483	0.000082	0.000108	0.000317	0.017804	0.198017	0.444991
TEL	0.608166	0.000066	0.000108	0.000235	0.015330	0.170024	0.41234
BIO	0.644933	0.000070	0.000108	0.000244	0.015620	0.184096	0.429065
TLV	1.364809	0.000147	0.000108	0.000332	0.018221	0.60563	0.778222

Source: Own calculations

Analyzing the results presented in the previous table shows that two titles supra unit values of the coefficient β (SNP and TLV), being volatile securities (in the literature can be found the name offensive titles) which means that a variation of ± 1% of the general index of the stock market, in this case the BET ($E_{M0} – E_{M1}$) causes a variation greater than ± 1% of the profitability title. Thus, in a variation of the profitability of the market with ±1%, the profitability of SNP to read ± 1.048% and that of the title + 1.36% TLV. For other titles, values sub unit beta coefficients which signify a lower variability of the title was "i" due to the change in the profitability of the market. Thus, for ($E_{M0} – E_{M1}$) = ± 1%, resulting ($E_{i0} – E_{i1}$) < ± 1%. Further, we evaluated the efficiency expected of the titles reviewed using the CAPM model. In this regard, we have calculated the market risk (systematic) risk and specific title (unsystematic). The systematic risk of the title "i" ($\sigma_{S(i)}$) is determined on the basis of the following formula:

$$\sigma^2_{S(i)} = \beta_i^2 \cdot \sigma^2_M, \quad (8)$$

And unsystematic risk ($\sigma_{\varepsilon(i)}$):

$$\sigma^2_{\varepsilon(i)} = \sigma_i^2 - \sigma^2_{S(i)} \quad (9)$$

The values recorded by the two risks for the 10 stocks analyzed here, are shown in the following table (table 5):

Table no. 5.

Yields forecast based on CAPM model, the systematic risk and unsystematic risk for those 10 stocks analyzed

	βi	R_f	E_i	Systematic risk	Unsystematic risk
ELMA	0.746011	0.015836%	0.051767%	0.775277%	2.240300%
SNP	1.047695	0.015836%	0.066297%	1.088797%	1.012187%
BRM	0.349496	0.015836%	0.032669%	0.363207%	3.014644%
TGN	0.657102	0.015836%	0.047485%	0.682880%	1.201530%
TUFE	0.658793	0.015836%	0.047566%	0.684638%	3.145039%
SIF5	0.994074	0.015836%	0.063715%	1.033072%	1.225872%
SIF4	0.762483	0.015836%	0.052560%	0.792396%	1.594399%
TEL	0.608166	0.015836%	0.045128%	0.632025%	1.396619%
BIO	0.644933	0.015836%	0.046899%	0.670234%	1.410952%
TLV	1.364809	0.015836%	0.081571%	1.418351%	1.143801%

Source: Own calculations

A comparative analysis of the values recorded by the beta volatility coefficient and systematic risk is ascertained, as the beta value increase, shall be increased and systematic risk, the latter being strongly correlated with changes in the stock market. It was shown that the risk of the market (systematic) can't be lessened or eliminated through diversification of the portfolio, as a result of investors on the stock market should be directed to the titles recorded lower values of beta coefficient (less volatile securities). Also, in these circumstances, the return on investment will be lower because only one risk which is not remunerated it market systematic (market).

Predicting the future efficiency of the portfolio constructed using CAPM

Similarly, I proceed to determine the yield expected of financial instruments portfolio review consisting of the 10 titles using the CAPM model.

$$E_P = R_f + \beta_P \cdot (E_M – R_f) \quad (10)$$

$$\beta_P = \frac{\sigma_{PM}}{\sigma_M^2}$$

Indicator	Portfolio
β_p	0.783356
$\sigma_{P/M}$	0.000085
σ^2_M	0.000108
σ^2_P	0.000109
σ_P	0.010440

Source: Own calculations

The systematic risk of the portfolio ($\sigma_{S\ (p)}$) is determined on the basis of the following formula:

$$\sigma^2_{S(p)} = \beta^2_p \cdot \sigma^2_M, \quad (11)$$

and unsystematic risk ($\sigma_{\varepsilon(p)}$):

$$\sigma^2_{\varepsilon(p)} = \sigma^2_p - \sigma^2_{S(p)} \quad (12)$$

Table no.6.

Yield forecast based on portfolio CAPM model, the systematic risk and unsystematic risk

Indicator	Portfolio
β_p	0.783356
R_f	0.015836%
E_p	0.053566%
Systematic risk	0.814087%
Unsystematic risk	0.653653%

Source: Own calculations

The portfolio, thus constructed, can be considered a "moderate" because of its expected yield, sensitivity to changes in the capital market being a subunit. It also shows the correlation between the beta and the value recorded by the systematic risk (market), the latter being a subunit (table 6).

Conclusions

In analyzing a market, Sharpe has introduced the idea of the market portfolio that portfolio containing one of each title, the weighting being made according to the ratio between the market value of each title and the total value of the market. Sharpe also linear relationship established between profitability and hoped for the amount of systematic risk assumed by an investor buying a title, whose expression is the right of the SML (Security Market Line). CAPM model suffered during the period which has elapsed since its creation, a number of changes designed to ensure its compatibility with the specific conditions of the capital market (with company size adjustment, adjustment of taxation level, etc).

In the research, I used the model of evaluation of financial assets CAPM (Capital Asset Pricing Model) to estimate future yields both titles included in the portfolio and the return on the portfolio. The analysis revealed that the portfolio built from those 10 titles is “moderated” whereas its expected yield, sensitivity to changes in the capital market is a subunit ($\beta p = 0.783356$), and the correlation between the beta and the market risk is still sub unit. In terms of individual securities analysis, we found that the SNP and TLV titles are volatile, given the values of the coefficient β. supra unit, I also noted that an increase in both the beta and coefficient of market risk, the latter being strongly correlated with the development of the capital market.

Knowledge of beta coefficient has a particular relevance whereas for efficient portfolio management of financial instruments, it is the most important indicator.

The beta coefficient is used daily by the portfolio managers in connection with the development of the capital market. In a situation where it is estimated an increase in the overall index of the market BET, then the Portfolio Manager will buy securities with high volatility because they will record higher growth rate superior to the increase of the market profitability. In the reverse situation, when it is expected a reduction in the overall market index, the Manager will buy BET shares with low volatility that will have the lowest decrease of profitability in relation to the decrease of the market.

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