Financial Investment Management: Testing the Market Model on the Romanian Capital Market during the Post Financial Crisis

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ABSTRACT
This article presents an analysis of the decision of investing in the capital market in Romania during 2009-2010, in the context of overcoming the global financial crisis.
In the first part of the paper, we have made a brief presentation of the simplified model of market analysis introduced in the specialized literature by William Sharpe, the respective model representing the starting point in our study. The purpose of the present study is to emphasize how the evolutions of the financial securities rates listed on the Bucharest Stock Exchange could be explained based on the evolution of BET Romanian capital market index. Although the study over this phenomenon has begun in the middle of the last century, every day new studies appear that are either coming in addition to the already existing ones or are bringing a new approach regarding the financial theory. The novelty of the present study conducted by us resides in the highlighting of the evolutions of the financial securities rates during July 2009 – December 2010 periods.
The second part of the paper presents the results of a study conducted on the Romanian capital market, emphasizing the correlations between the most important securities on the Romanian capital market, as parts of BET index and market index. The aim is to check whether during this period the evolution of the financial securities' return can be explained more or less by the return of the capital market.

KEYWORDS: *financial market model, return of financial securities, security-market correlation.*

JEL Classification: G01, G12

1. Previous research

Analyzing the capital market, one can easily note that its trends are generally followed by all the financial securities. Thus, if the stock exchange is situated on an upward trend, most of the securities' rates are increasing, and vice-versa if the capital market goes through a period of recession.

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The market model is one of the first models to determine a link between the profitability of a financial security and the general return of the market. This model presents a linear simple link, showing virtually the contribution of the financial security's return to the profitability of the market (Stancu, 2007, p. 260). The model was presented by William Sharpe (1963) in "*A Simplified Model for Portfolio Analysis*", where he clarifies how the profitability of many securities can be explained through a simple relationship with only one external factor that can be considered the index of a financial market.

However, as it is emphasized later on, the market does not fully reflect the changes in the securities' rates from one day to another, so a specific factor will be identified.

Taking into account the above mentioned elements, the total risk of the financial securities is composed by two parts:

- Systematic risk or market risk – which is expressed through the variability of the capital market or the variability of main macroeconomic indicators (GDP, inflation rate, average interest rate). These macroeconomic indicators influence the expectations of investors for the future evolution of the stock exchange (Robu & Ciora, 2010, p. 311).
- Specific risk – which is the part of the total risk that is not explained by the variability of the stock market index. It is also affected by two types of influences: the one of the internal factors of the economic activity of the issuer and the one of the economic sector in which the company operates. Only this type of risk could be diversified by developing a diversified portfolio of securities (Markowitz, 1952).

2. Presentation of the model

The correlation between the return of the asset and the return of the capital market could be determined either by the graphical method or by the statistical method of the least squares.

By developing a regression model taking into account the two returns, the beta (β_i) volatility coefficient could be determined and also the alpha (α_i) coefficient. Using the two coefficients, the residual random factor could be determined:

$$Ri = \alpha_i + \beta_i * R_M + \varepsilon \tag{1}$$

This is the model presented by Sharpe (1963), for which the beta coefficient (β_i) reflects the sensitivity of the share to changes in the overall profitability of the market. The disposition of the intersection points on the regression graphic indicates the systematic or unsystematic nature of the security's risk variation. In this way, closer the individual regression points are to the regression line, the respective financial security is stronger correlated with the capital market and the systematic risk will have a higher influence in the total risk.

Alpha (α_i) parameter from the regression graphically represents the intersection between the regression line and the vertical coordinate axis and it represents the size of the (i) asset when the profitability of the stock market is zero.

The residual variable (ε) is the part of the (i) security's profitability that is unexplained by the market model. It measures the profitability determined by the specific evolution of the issuing company. The (ε) variable is a residual random and independent variable of the profitability of the capital market:

$$\varepsilon_i = R_i - R_i^* \tag{2}$$

where (Ri*) is the profitability estimated by regression.

The present study is about finding the link between the evolution of the returns of the financial securities that are components of the BET index and the evolution of the profitability of the same index. The aim is to observe if the evolution of a security is correlated with the evolution of the index to which it pertains to, to what extent this type of correlation is correct, and whether the securities with a higher proportion in the composition of BET index have indeed a causal relationship in the same direction. Given the previous studies, it could be mentioned that the link is indeed a strong one, but are the same findings also correct when the market is affected by the financial crisis? Which of the securities do manifest a stronger link and why?

In this sense, **the description of the database** used for the analysis is necessary. The database includes daily rates of the financial securities listed on the Bucharest Stock Exchange and included in the BET index on 30 December 2010. Observation range is 1 July 2009 – 30 December 2010, and the choice of this period of one and a half years is highly motivated by the need for a significant range of data in order to have a proper statistical interpretation of the financial indicators' dynamics. In this respect, we analyzed the 10 BET-related financial securities. If there were days without any transactions, we considered the respective rate equal to the one corresponding to the last day of trading. We designed this correction for equalizing the number of trading days of each share with that of the BET index, and thus to use the regression on equal lines of data.

The returns have been calculated as daily simple returns, using the following formula:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}} * 100 \tag{3}$$

where $P_{t,}$ P_{t-1} represent asset prices at times t, $t-1$ respectively.

3. Empirical results

To analyze the market model we used SAS 9.2 software and the procedure of regression (proc reg data=ad.omv outest=ad.rez_studiu; model TLV=BETC / covb r clm cli; run). Basically we have made 10 regressions between the daily returns of the financial securities of the above mentioned period and the return of the market's BET index. The results are significant, *t-student* statistics for causal variable coefficient shows that it is outside the range of rejection of the null hypothesis.

The table below (Table 1) presents the values of beta coefficients (β):

Table 1. Beta coefficient (β) values for BET-component securities

	TLV	BRD	SNP	TGN	TEL	BIO	COMI	BRK	AZO	DAFR
(β)	1.11	1.14	1.15	0.82	1.02	1.28	1.16	1.41	0.94	1.38

Source: Authors' processing using Bucharest Stock Exchange data.

We can see that most of the securities have values higher than 1, indicating a higher volatility of that financial security in comparison with the market. Taking into account the fact that the first three securities – TLV, BRD, and SNP, describing approximately 62% of

the composition of BET – and 8 out of 10 BET-securities are more volatile than the market, we can argue that this period is characterized by sharp increases and decreases in the analyzed financial securities, which will generate, of course, the same effect on the BET index.

However, the testing of the Sharpe model requires more than a simple analysis of the coefficients of volatility. The table below (Table 2) synthesizes the determination coefficients of the resulted regression models:

Table 2. R^2 values for BET-component securities

	TLV	BRD	SNP	TGN	TEL	BIO	COMI	BRK	AZO	DAFR
R^2	0.44	0.74	0.69	0.60	0.52	0.66	0.30	0.56	0.31	0.46

Source: Authors' processing using Bucharest Stock Exchange data.

As one can see, no coefficient has a value over 0.8, which would have meant a very strong link between financial securities and the BET index. Table 2 shows that, during this period, the evolution of the profitability of BRD securities can be explained in a higher proportion by the BET evolution, in other words the BRD shares have the same trend as the average evolution of the other shares composing of BET. At the other extreme are COMI and AZO shares, which are characterized only by 30% of the evolution of BET-component securities. This fact implies that their evolution cannot be expressed mainly by the market, but by specific factors related to the nature of the firm.

Previous studies have shown that, at least in periods of economic growth, the correlation between the security and the market is quite a significant one. As one can see, during the period analyzed by us in the current economic context, this observation is no longer available, at least for some securities. The companies whose securities are no longer conforming to the model, in our case AZO and COMI, are perhaps also the most affected by the financial crisis from the end of the last decade, conducting their businesses in highly restricted areas in terms of recent investments, like the constructions or the industry sector.

4. Conclusions

The above results show that the evolution of many of the most significant financial securities for the Romanian capital market can be explained only in a relatively low degree by the evolution of the main stock index (BET) in the last year and a half. Taking this result into account, an investor should be quite reluctant about investing in these shares solely based on the overall development of the market, because, as noted above, many of the analyzed shares have their own quite significant component of profitability evolution.

Responding only to the pulse of the stock market, especially in this period of economic recovery of the capital markets, and without a thorough study of each financial security that will be taken into the investor's portfolio, could be a loser game, since volatilities of the financial securities are still quite high and they also determine a volatile market. The results are intuitive because during periods of market decline the expected returns and estimated synergies are lower than in times of market growth (Hurduzeu et al., 2010).

In the future, this article may be developed as a compared study of the Sharp model applied in the pre-crisis period, during and after the global financial crisis.

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