HOW RISKY ARE SIF'S SECURITIES?

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Abstract: *The capital asset pricing model (CAPM) lies at the heart of models in financial economics and it has a long history of theoretical and empirical investigations. The beta (β) of the stock is a measure of how much specific risk remains in the stock after all possible risks are diversified. The specific risk of an individual stock is the slope coefficient of the regression between the return for the individual security and the return for the market index. The main aim of the paper is to measure the systematic risk for a given number of stocks from the Romanian capital market in order to determine if these stocks are riskier than the market itself. The focus is on market risk and not on the company-specific risk and the hypotheses tested states that "stock market prices are mainly set based on the trading activity of the investors". Using data for the period 2001-2014, the results suggest that all SIF's were bearing a higher risk than the market itself, with an increasing level for the sub-period 2008-2014 (post crisis). Since SIF's are earning a high return too, these results are consistent with risk-return trade-off. The results remain robust even when was used monthly return instead of daily return.*

Keywords: CAPM, beta, stock, risk, return

JEL classification: D53, G11

1. Introduction

The capital asset pricing model (CAPM) lies at the heart of models in financial economics and it has a long history of theoretical and empirical investigations. The underlying concept of the CAPM model is the positive association between risk and return. In other words, stocks with a high level of risk should earn a higher return and vice versa (Perković, 2011).

Beta (β), i.e. the covariance of a stock's return relative to the market portfolio, is a critical measure of the systematic risk of the stock. In risk models in finance, beta have two mainly features. First, instead of measuring total risk it measures the risk added on to a diversified portfolio. Therefore it is likely for a stock to have a high level of risk in terms of individual risk and a low level in terms of market risk. Second, beta is a relative approach of systematic risk in comparison to the benchmark selected.

The main aim of the paper is to measure the systematic risk for a given number of stocks from the Romanian capital market in order to determine if these stocks are riskier than the market itself. The focus is on market risk and not on the company-specific risk and the hypotheses tested states that "stock market prices are mainly set based on the trading activity of the investors". To do so, I estimate beta for all financial investments societies (SIF) by regressing their return against BET index return over 2001-2014. The motivation for testing SIF's stocks relates to their importance on the Romanian stock market, formerly known as "the stock exchange engine". The results suggest that all SIF's were bearing a higher risk than the market itself, with an increasing level for the sub-period 2008-2014 (post crisis). Since SIF's are earning a high return too, these results are consistent with risk-return trade-off.

The paper is organized as follows. Section two briefly highlights the theoretical considerations regarding CAPM model and the role of beta. Section three describes the variables used and methodological framework. Section four reports the results while section five concludes.

2. Literature review

It is well known that investors with diversified portfolio care very little about company-specific risk because that risk can have little impact. On the other hand, they are affected by market risk which is not diversifiable and therefore stock prices will tend to be determined without regard to company-specific risk (Patton and Verado, 2012).

The pioneer of the CAPM was Markowitz which states that investors' select "mean-variance-efficient" portfolios either maximize the expected return or minimize the risk (Markowitz, 1952). Later, Sharpe (1964) and Lintner (1965) developed the Markowitz model by including several hypotheses. Among these it could be mentioned that investors assess their investments over the same single holding period, perfect capital markets and same investment opportunity. According to their models there is a positive and linear relationship between risk (β), and expected return. Thus beta risk has become the iconic symbol of the CAPM (Benson and Faff, 2013). The CAPM equation is the following:

$$\mathrm{Re} = \mathrm{Rf} + \beta(\mathrm{Rm} - \mathrm{Rf}) \qquad (1)$$

where Re is the expected return on the stock, Rf is the risk-free rate, β is a measure of the level of market risk in the stock, and Rm is the expected return on the market portfolio.

From empirical point of view, several findings support CAPM model. Black et al. (1972) found that the relation between the average return and beta is very close to linear and portfolios with high betas have high average returns and vice versa. Fama and MacBeth (1973) lead to similar results, i.e. positive relation between risk and return but Fama and French (1992) found and insignificant relation between beta and cross-section returns.

Later, Perković (2011) state that beta is not appropriate measure of risk on underdeveloped stock markets as Croatian. Patton and Verado (2012) investigate whether firm-specific information affects the market risk of a stock and the results reject the hypothesis tested. Given the controversial and relative results for different samples and methodologies one could argue that additional research is required in order to reach a consensus.

3. Data and methodology

Modern Portfolio Theory states that investors are not rewarded for the total risk of an investment and rather for the systematic risk. The motivation for such hypothesis is that total risk includes firm specific risk which can be eliminated in a well diversified portfolio. The beta (β) of the stock is a measure of how much specific risk remains in the stock after all possible risks are diversified (Hoover, 2006). The specific risk of an individual stock is the slope coefficient of the regression between the return for the individual security and the return for the market index.

There are three main issues that an analyst should deal with in setting up the regression aforementioned. The first issue relates to the length of the estimation period. It is well known that a longer estimation period provides more data, but the companies itself might have changed in its risk characteristics over the time period. SIF's have changed substantially in terms of business mix after the financial crisis and therefore the regression

will be affected by these changes. In this respect, we perform an analysis for entire period, as well as for subsamples, respectively before (2001-2008) and after crisis (2008-2014).
The second issue relates to the return interval considered. In several data sources, stocks returns are available either annually, monthly, weekly, daily, and even. It is likely to increase the number of observations in the regression by using daily or intraday returns, but due to non-trading the coefficient are biased. The non-trading bias is reduced significantly by using weekly or monthly returns (Damodaran, 2008). To deal with this issue and for the robustness purpose, I performed regression based on both daily and monthly returns.
The third issue relates to the selections of a market index that can be used as a benchmark in the regression. Since I'm estimating the betas for the capital asset pricing model, the index that I'm using is BET index. BET index is the reference index for BSE market and it include the most 10 liquid companies.
In order to evaluate how SIF's performed as investments between 2001 and 2014 and how risky are, I regressed the returns on SIF's against returns on the BET index between June 2001 and April 2014. Data are collected from Bucharest Stock Exchange, statistics section. The returns on each SIF and the BET index are computed as follows:
The returns for SIF's stocks are computed both day on day and month on month from June 2001 to April 2014 and include exclusively the price evolution:

$$R_{SIFi,j} = \frac{Price_{SIFi,j} - Price_{SIFi,j-1}}{Price_{SIFi,j-1}} \quad (2)$$

where "$Price_{SIFi,j}$" is the price for SIFi at the end of day/month j; i = 1 to 5.
The return for BET index is computed for the same time period and for both return interval:

$$R_{BET\,j} = \frac{BET_j - BET_{j-1}}{BET_{j-1}} \quad (3)$$

where "BET_j" is the level of index at the end of day/month j.
Given these, the equation estimated in terms of raw returns is the following:

$$R_{SIFi,j} = \alpha + \beta \times R_{BET,j} + \varepsilon \quad (4)$$

In terms of estimation method, the equation is estimated using OLS method. Since the model is a times series data, it have been tested for serial correlation and heteroskedasticity. The specific tests suggest such issues and therefore it have been used the Newey West procedure to correct them.

4. Results

In this section, there are reported the results for the models employed. First, table 1 report the main descriptive statistics for the dependent variables.

Table 1: Descriptive statistics

Description	SIF1	SIF2	SIF3	SIF4	SIF5
		Daily Return			
Mean	0.001	0.001	0.001	0.001	0.001
Median	0.000	0.000	0.000	0.000	0.000
Std. Dev.	0.027	0.028	0.033	0.026	0.027
		Monthly Return			
Mean	0.039	0.042	0.033	0.032	0.041
Median	0.033	0.026	0.029	0.033	0.032
Std. Dev.	0.176	0.177	0.154	0.143	0.164

Source: Author calculation

One can observe that for daily return the average returns is low for all SIF's and al are characterized by volatility. Similar behavior is highlighted for monthly return. Surprisingly, the highest return is recorded for SIF2.

Next, it have been employed a daily return equation for each SIF, for entire sample as well as for specific pre (22.06.2001-15.08.2008) and post crisis (16.08.2008-04.04.2014) subsamples. The results are reported in table 2.

Table 2: Regression results – Daily Return

Sample	Variable	Models				
		SIF1	**SIF2**	**SIF3**	**SIF4**	**SIF5**
2001-2014	BET	1.064***	1.105***	1.024***	1.005***	1.081***
		(0.057)	(0.057)	(0.056)	(0.052)	(0.054)
	R-Squared	0.392	0.393	0.260	0.376	0.414
	Durbin-Watson	1.89	1.92	1.96	1.90	1.98
	# of observations	3094	3096	3093	3073	3087
2001-2008	BET	0.846***	0.873***	0.785***	0.860***	0.859***
		(0.067)	(0.076)	(0.079)	(0.066)	(0.069)
	R-Squared	0.245	0.227	0.115	0.242	0.247
	Durbin-Watson	1.95	2.01	1.97	1.88	2.07
	# of observations	1707	1712	1705	1694	1702
2008-2014	BET	1.246***	1.301***	1.228***	1.126***	1.267***
		(0.068)	(0.057)	(0.056)	(0.062)	(0.058)
	R-Squared	0.545	0.585	0.520	0.533	0.599
	Durbin-Watson	1.81	1.79	1.94	1.95	1.86
	# of observations	1387	1384	1388	1379	1385

Notes: HAC Standard errors are shown in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Author calculation

Globally, al SIF's are slighter riskier than the market itself, since β is higher than 1. The most risky seems to be SIF2 securities. However, when the sample is divided, one can observe that in the pre-crisis period the SIF's securities were less risky than the market itself. As expected, the securities encountered a higher level of risk after the crisis was triggered.

In order to deal with non-trading bias, it have been employed a monthly return equation for each SIF. Following the procedure aforementioned, the models were tested for entire period as well as for pre and post crisis period. The results are reported in table 3.

Table 3: Regression results – Monthly Return

Sample	Variable	Models				
		SIF1	**SIF2**	**SIF3**	**SIF4**	**SIF5**
2001-2014	BET	1.271***	1.410***	1.266***	1.084***	1.386***
		(0.178)	(0.168)	(0.115)	(0.085)	(0.158)
	R-Squared	0.449	0.533	0.557	0.490	0.587
	Durbin-Watson	2.59	2.26	2.01	2.10	2.13
	# of observations	141	139	139	138	137
2001-2008m8	BET	0.991***	1.145***	1.098***	1.147***	1.145***
		(0.203)	(0.180)	(0.182)	(0.141)	(0.199)
	R-Squared	0.383	0.422	0.430	0.488	0.459
	Durbin-Watson	1.99	1.96	1.74	1.82	1.76

	# of observations	78	76	76	75	77
2008m9-2014	BET	1.570***	1.670***	1.425***	1.009***	1.666***
		(0.241)	(0.195)	(0.118)	(0.107)	(0.174)
	R-Squared	0.522	0.641	0.689	0.490	0.735
	Durbin-Watson	2.94	2.47	2.34	2.53	2.56
	# of observations	63	63	63	63	60

Notes: HAC Standard errors are shown in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Author calculation

Therefore, several conclusions could be drawn from these results. First, all SIF's securities are riskier than the market itself. The risk was more pronounced in the post-crisis period. Second, SIF2 remain the most risky which is consistent with risk-return relation. SIF2 recorded the highest level of risk (the highest coefficient, i.e. 1.410) and at the same time exhibited the highest level of return (4.2%). Third, in terms of magnitude of the coefficients, the coefficients (β's) are greater in monthly return than in daily return models. This result do not reject the hypothesis which state that non-trading period returns will reduce the coefficient and the correlation between the security and market return.
To sum up, the results suggests the significance of β from the CAPM model which is consistent with previous findings.

5. Conclusions

The main aim of paper was to determine systematic risk for Romanian financial investments societies (SIF), i.e. if β is significant in the relation between stock and market return. Using an individual regression for each out of the 5 SIF's and BET index for the period 2001-2014, the results highlights that all SIF's were riskier than the market itself. This conclusion remain robust even when was used monthly return instead of daily return. As a particular result, the risk was higher for the sub-period 2008-2014, i.e. the post-crisis period. However, a high level of risk is associated with a high level of return, for the same period SIF's were in the top performance stocks.
In terms of implications for practitioners and decision makers the results should be treated with cautiousness, since there is a controversial debate if the historical β's is applicable to the future.

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