EasyChair Preprint

№ 6128

Study on the Evaluation of Financial Assets by Capital Asset Pricing Model

Nicolae Balteș and Ruxandra Maria Pavel

July 21, 2021

Study on the evaluation of financial assets by Capital Asset Pricing Model

Professor Nicolae Balteș PhD[1], Ruxandra Maria Pavel PhD [2]

[1] „Lucian Blaga" University, Faculty of Economics, Sibiu, Romania, nicolae.baltes@ulbsibiu.ro
[2] „Lucian Blaga" University, Faculty of Economics, Sibiu, Romania, pavel_ruxandra_maria@yahoo.com

Abstract: CAPM is the model by which the expected return on a financial asset can be determined, relative to the cost of invested capital and the systematic risk determined by the general evolution of the capital market. The model is used to set the prices of risky securities when building a diversified portfolio of financial securities. The present study aims to highlight the change in the price of financial securities together with the changes in the general index of the Bucharest Stock Exchange (BET). The research sample consists of a number of four companies: BCM, EFO, TUFE and CAOR, belonging to the hotel and restaurant industry, listed on the Bucharest Stock Exchange, premium category. The research was conducted for a period of 104 weeks (01.01.2019-31.12.2020) and the result of the research showed that the profitability of the stock market may record weekly, in the future, values between 0.0498% ± 3.8693%, compared to values recorded during 2020. Also, the securities of the companies included in the research registered subunit volatilities, with relatively stable prices, being less volatile with the capital market. Following the application of the CAPM model, it was concluded that the shares of the companies included in the research are undervalued, respectively recorded a level of expected return on the portfolio lower than the expected return on the market portfolio, being recommended in this case their acquisition.

Key words: Capital Asset Pricing Model, Capital Market Line, market return, stock return, systematic risk

JEL classification: G12, G15.

1. Introduction

The stock market is a fundamental component of any national economic system, and is intended to ensure the necessary transfer of capital between holders of financial resources and entities wishing to attract those resources and, in return, to provide a range of financial instruments.

The Capital Asset Pricing Model (CAPM) was introduced by William Sharpe (1964), Jack Treynor (1961), Jan Mossin (1966) and John Lintner (1965), and highlights the link between supply and demand for risky assets. CAPM is built on the work of Harry Markowitz (1959), the medium variation model or portfolio choice model, used to determine a rate of return necessary for a theoretically adequate return and the expected price if firms can estimate the flows of future cash.

The CAPM model highlights the link between the return on individual securities and the return on the financial market. The first fundamental hypothesis of the model is that investors are concerned about the expected return in close connection with the risk associated with it. Thus, in conditions of equilibrium of the financial market, the model highlights a linear relationship between the expected return of the portfolio and the risk assumed by investors (Balteș, N., Dragoe A.-G.-M. and Doru I.-A, 2014).

The basic idea of the CAPM model is that, in conditions of equilibrium of the efficient financial market, the profitability of a securities is determined by a macroeconomic factor, respectively the general profitability of the capital market (RM) quantified through the variation of the general stock market index. (systematic risk) and the coefficient β of the respective security (Ion Stanciu, 2002, p.143). Thus, the concept of market model highlights the relationship between the profitability of a financial security and the profitability of the capital market, determined by the general market index (BET).

The CAPM model introduces the concept of risk-free assets, "the hypothesis of its existence being essential for substantiating the capital market theory, through the major implications on how to determine returns and potential risks and on possible risk-return combinations" (Maria Prisacariu, 2009, p. 69). The model allows the quantification of risk and the establishment of the relationship between risk and profitability of financial securities (Radu Stroe, 2000, p.8).

2. The stage of knowledge

The CAPM model has been the subject of a large number of empirical studies since the work of Lintner and Sharpe in the 1960s; Fame and MacBeth (1973); Douglas (1968); Blume (1973); Miller and Scholes (1972); Stambaugh (1982).

In developing his model, William Sharpe was the one who introduced in the portfolio of risky assets, a risk-free asset in different combinations, in relation to the risk of the investor's portfolio. This led to a new frontier of efficiency, with a certain form: that of a line, known as the Capital Market Line - LMC (Sharpe, 1963).

The LCM equation is (Radu Stroe, 2000, p.9):

$$E_p = R_f + \frac{E_M - R_f}{\sigma_M} \times \sigma_p, \text{ Equation (1)}$$

Where: E_p = expected return on a portfolio of risky assets; R_f = return on risk-free financial instruments; E_M = expected return on the market portfolio; σ_M = security of the stock relative to the market (CML straight slope).

CAPM is the equation of the model by which the average profitability of a portfolio of risky assets E_p can be measured, starting from (Mossin, J., 1966, p.774):

- untitled rate R_f (constant exogenous and financial market, as a rate of return on the money market).
- the anticipated average profitability of the E_M market.
- the security risk in relation to σ_M square or the unit price of the market risk. It is, in fact, a sloping LCM (σM represents market risk).
- portfolio risk σ_p.

In the market analysis, Sharpe introduced the idea of the market portfolio, which contains one of each security, the weighting being made according to the ratio between the market value of each security and the total market value. Thus, the efficiency of the CAPM model, together with the identification of the LMC line, consists in determining the linear relationship between profitability and hope for the systematic risk assumed by an investor buying a security (Sharpe, 1964), respectively the SML (Line Market Security) relationship (Sharpe, W., 1964, p.429):

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

Where, E_i = expected return on portfolio, R_f = return on risk-free financial instruments, β_i = slope of the regression line, beta, the measure that gives the size of the portfolio return movement in the direction of market evolution, E_M = expected return on market portfolio; $E_M - R_f$ = market risk premium.

The SML relationship shows that the hope for an expected financial return lies in the risk-free rate plus a risk premium. The first risk is equal to the product of the difference between the average market returns, the risk-free rate and the volatility coefficient.

Beta is an indicator calculated for each security, depending on the risk of that security versus market risk. The interpretation of this indicator is relatively simple, respectively ß is equal to the covariance between the return of the title and the return of the market, related to the variance of the rate of return of the market, by the expression (Sharpe, W., 1964, p.430):

$ß_S = \frac{\sigma_{s*p}}{\sigma_{2p}}$, Equation (3)

The higher the value of the coefficient ß, the higher the systematic risk of the financial asset. Beta is a coefficient of elasticity of the change in the individual return on the security following a change in the overall return on a unit.

3. Research methodology

In order to highlight the change in the price of securities with the changes in the general index of the Bucharest Stock Exchange (BET), the beta coefficient of the securities was calculated, which expresses the amount of systematic risk for the period of time studied. Thus, the values of the BET index and the closing prices of the securities were used for companies in the hotel and restaurant industry listed on the Bucharest Stock Exchange on the main segment, namely CASA DE BUCOVINA-CLUB DE MUNTE (BCM), TOURISM, HOTELS, RESTAURANTE MAREA NEAGRA SA (EFO), TURISM FELIX SA (TUFE), SIF HOTELURI SA (CAOR). The time period is one week during two years, resulting in a number of 104 weeks (period 01.01.2019-31.12.2020). At the same time, the risk of the respective securities expressed by dispersion (σ^2_p) and mean square deviation (σ_p) was determined, as well as the intensity of the correlation between the yields of the security and that of the market, through the correlation coefficient (ρs*p).

The assumptions from which it was started are the following: the shares of the companies in the hotel industry and of the restaurants listed on the Bucharest Stock Exchange, on the main segment, are undervalued; respectively, the expected return on the portfolio is lower than the expected return on the market portfolio.

4. Descriptive analysis

By determining the variation of the BET index at one week, the profitability (Rp) and the market risk (σ_p) for the analyzed period were determined.

Table 1. Calculation of market profitability and risk

Year 2019	BET	Rp (%)	Rp – Rpm (σ_p)	σ^2_p	Year 2020	BET	Rp (%)	Rp – Rpm (σ_p)	σ^2_p
07.01.19	7.683,07				06.01.20	9.865,83			
14.01.19	6.934,35	-9,7451	-10,2808	105,6942	13.01.20	10.023,95	1,6027	1,5529	2,4115
21.01.19	7.159,24	3,2431	2,7074	7,3301	20.01.20	10.095,26	0,7114	0,6616	0,4377
28.01.19	7.005,96	-2,1410	-2,6767	7,1648	27.01.20	10.105,37	0,1001	0,0504	0,0025
04.02.19	7.294,19	4,1141	3,5784	12,8047	03.02.20	9.958,13	-1,4570	-1,5068	2,2706
11.02.19	7.371,61	1,0614	0,5257	0,2763	10.02.20	10.012,30	0,5440	0,4942	0,2442
18.02.19	7.764,01	5,3231	4,7874	22,9194	17.02.20	10.108,05	0,9563	0,9065	0,8218
25.02.19	7.772,07	0,1038	-0,4319	0,1865	24.02.20	9.849,05	-2,5623	-2,6121	6,8231
04.03.19	7.803,75	0,4076	-0,1281	0,0164	02.03.20	9.452,51	-4,0262	-4,0760	16,6135
11.03.19	7.935,54	1,6888	1,1531	1,3296	09.03.20	8.733,96	-7,6017	-7,6515	58,5451

18.03.19	7.883,39	-0,6572	-1,1929	1,4230	16.03.20	7.126,73	-18,4021	-18,4519	340,4714
25.03.19	7.954,29	0,8994	0,3637	0,1322	23.03.20	7.038,95	-1,2317	-1,2815	1,6422
01.04.19	8.143,10	2,3737	1,8380	3,3782	30.03.20	7.483,17	6,3109	6,2611	39,2013
08.04.19	8.248,40	1,2931	0,7574	0,5737	06.04.20	7.706,49	2,9843	2,9345	8,6113
15.04.19	8.271,75	0,2831	-0,2526	0,0638	13.04.20	8.302,45	7,7332	7,6834	59,0351
22.04.19	8.402,88	1,5853	1,0496	1,1016	20.04.20	7.935,06	-4,4251	-4,4749	20,0245
29.04.19	8.416,03	0,1565	-0,3792	0,1438	27.04.20	8.019,11	1,0592	1,0094	1,0190
06.05.19	8.380,61	-0,4209	-0,9566	0,9150	04.05.20	7.992,41	-0,3330	-0,3827	0,1465
13.05.19	8.164,57	-2,5779	-3,1136	9,6943	11.05.20	8.406,04	5,1753	5,1255	26,2707
20.05.19	8.205,08	0,4962	-0,0395	0,0016	18.05.20	8.298,02	-1,2850	-1,3348	1,7817
27.05.19	8.242,22	0,4526	-0,0831	0,0069	25.05.20	8.688,36	4,7040	4,6542	21,6618
03.06.19	8.582,23	4,1252	3,5895	12,8846	01.06.20	8.701,29	0,1488	0,0990	0,0098
10.06.19	8.583,26	0,0120	-0,5237	0,2743	08.06.20	8.848,75	1,6947	1,6449	2,7057
17.06.19	8.504,24	-0,9206	-1,4563	2,1209	15.06.20	8.532,77	-3,5709	-3,6207	13,1094
24.06.19	8.625,92	1,4308	0,8951	0,8012	22.06.20	8.683,52	1,7667	1,7169	2,9478
01.07.19	8.797,06	1,9840	1,4483	2,0976	29.06.20	8.626,28	-0,6592	-0,7090	0,5026
08.07.19	8.877,53	0,9147	0,3790	0,1437	06.07.20	8.595,51	-0,3567	-0,4065	0,1652
15.07.19	9.145,28	3,0160	2,4803	6,1521	13.07.20	8.470,52	-1,4541	-1,5039	2,2618
22.07.19	9.049,50	-1,0473	-1,5830	2,5060	20.07.20	8.489,21	0,2206	0,1709	0,0292
29.07.19	8.998,36	-0,5651	-1,1008	1,2118	27.07.20	8.586,12	1,1416	1,0918	1,1920
05.08.19	9.016,57	0,2024	-0,3333	0,1111	03.08.20	8.431,74	-1,7980	-1,8478	3,4144
12.08.19	9.100,65	0,9325	0,3968	0,1574	10.08.20	8.620,18	2,2349	2,1851	4,7747
19.08.19	9.073,32	-0,3003	-0,8360	0,6989	17.08.20	8.711,13	1,0551	1,0053	1,0106
26.08.19	9.044,48	-0,3179	-0,8536	0,7286	24.08.20	8.737,14	0,2986	0,2488	0,0619
02.09.19	9.259,73	2,3799	1,8442	3,4011	31.08.20	8.997,28	2,9774	2,9276	8,5709
09.09.19	9.234,57	-0,2717	-0,8074	0,6519	07.09.20	9.064,65	0,7488	0,6990	0,4886
16.09.19	9.289,26	0,5922	0,0565	0,0032	14.09.20	9.368,12	3,3478	3,2981	10,8771
23.09.19	9.542,83	2,7297	2,1940	4,8137	21.09.20	8.891,59	-5,0867	-5,1365	26,3837
30.09.19	9.574,37	0,3305	-0,2052	0,0421	28.09.20	9.010,30	1,3351	1,2853	1,6520
07.10.19	9.546,33	-0,2929	-0,8286	0,6865	05.10.20	8.869,35	-1,5643	-1,6141	2,6054
14.10.19	9.517,82	-0,2986	-0,8344	0,6961	12.10.20	8.887,41	0,2036	0,1538	0,0237
21.10.19	9.580,63	0,6599	0,1242	0,0154	19.10.20	8.872,04	-0,1729	-0,2227	0,0496
28.10.19	9.681,80	1,0560	0,5203	0,2707	26.10.20	8.750,75	-1,3671	-1,4169	2,0076
04.11.19	9.650,99	-0,3182	-0,8539	0,7292	02.11.20	8.566,02	-2,1110	-2,1608	4,6691
11.11.19	9.720,79	0,7232	0,1875	0,0352	09.11.20	9.129,64	6,5797	6,5299	42,6400
18.11.19	9.724,93	0,0426	-0,4931	0,2432	16.11.20	8.906,97	-2,4390	-2,4888	6,1940
25.11.19	9.772,01	0,4841	-0,0516	0,0027	23.11.20	9.173,76	2,9953	2,9455	8,6760
02.12.19	9.903,07	1,3412	0,8055	0,6488	30.11.20	9.286,11	1,2247	1,1749	1,3804
09.12.19	9.937,67	0,3494	-0,1863	0,0347	07.12.20	9.493,39	2,2322	2,1824	4,7627
16.12.19	9.966,11	0,2862	-0,2495	0,0623	14.12.20	9.573,01	0,8387	0,7889	0,6224
23.12.19	9.877,96	-0,8845	-1,4202	2,0170	21.12.20	9.587,61	0,1525	0,1027	0,0106
30.12.19	9.977,30	1,0057	0,4700	0,2209	28.12.20	9.718,49	1,3651	1,3153	1,7300
		27,3210		***219,6189***			***2,5393***		***763,5643***
		Rpm= 0,5357		**σ^2p= 4,3063**			**Rpm= 0,0498**		**σ^2p= 14,9718**

Source: author processing based on the data provided by the portal www.bvb.ro, in the Excel program

Where: Rp = market profitability, depending on the evolution of the BETPlus index; Rpm = average market profitability; σ_p = standard market deviation (total risk); σ^2_p = dispersion of market profitability.

Thus, the following results were obtained:

- Rpm 2019= 0,5357
- $\sigma^2_p = \sum (Rp-Rpm)^2/53 = 4,3063$
- $\sigma_p = \sqrt{\sigma_p^2} = \sqrt{4,3063} = 2,0751$
- Rpm 2020= 0,0498
- $\sigma^2_p = \sum (Rp-Rpm)^2/53 = 14,9718$
- $\sigma_p = \sqrt{\sigma_p^2} = \sqrt{14,9718} = 3,8693$

We can say that the profitability of the stock market may record weekly, in the future, values between 0.0498% ± 3.8693%, compared to 2020.

Starting from the methodology used by Joshua Aizenman, Menzie Chinn and Hiro Ito (Nagy Ágnes, 2013, p.45), in order to determine the exchange rate stability, we will change this by replacing the daily exchange rate with the weekly closing price, and of the half-yearly standard deviation with a monthly one.

In order to determine the formula for calculating the stability of the closing price, we adapted the formula for determining, this being:

$Pi_s = \frac{0,01}{0,01 + \Delta\, \sigma_{pi\ log}}$; Equation (4)

where: Pi_s = closing price stability indicatorΔ σpi log = closing deviation of the closing price

Table 2. Standard deviation of the variation Pi logarithm (Δ σpi log)

Luna	Valori (Δ σpi log)
Ianuarie 2019	0,02006056
Februarie 2019	0,01457966
Martie 2019	0,00371451
Aprilie 2019	0,00597824
Mai 2019	0,00492287
Iunie 2019	0,00257266
Iulie 2019	0,00668682
August 2019	0,00173981
Septembrie 2019	0,00759082
Octombrie 2019	0,00323486
Noiembrie 2019	0,00223074
Decembrie 2019	0,00183046

Luna	Valori (Δ σpi log)
Ianuarie 2020	0,00481247
Februarie 2020	0,00470538
Martie 2020	0,05708917
Aprilie 2020	0,01335594
Mai 2020	0,01499024
Iunie 2020	0,00577720
Iulie 2020	0,00328856
August 2020	0,01021790
Septembrie 2020	0,00963817
Octombrie 2020	0,00311683
Noiembrie 2020	0,01389609
Decembrie 2020	0,00421457

Source: author processing based on the data provided by the portal www.bvb.ro, in the Excel program

Once the closing deviation of the closing price is determined, we will determine the value of the closing price stability indicator, based on the formula presented above. Thus, in figure no. 1 shows the monthly evolution of the closing price stability indicator.

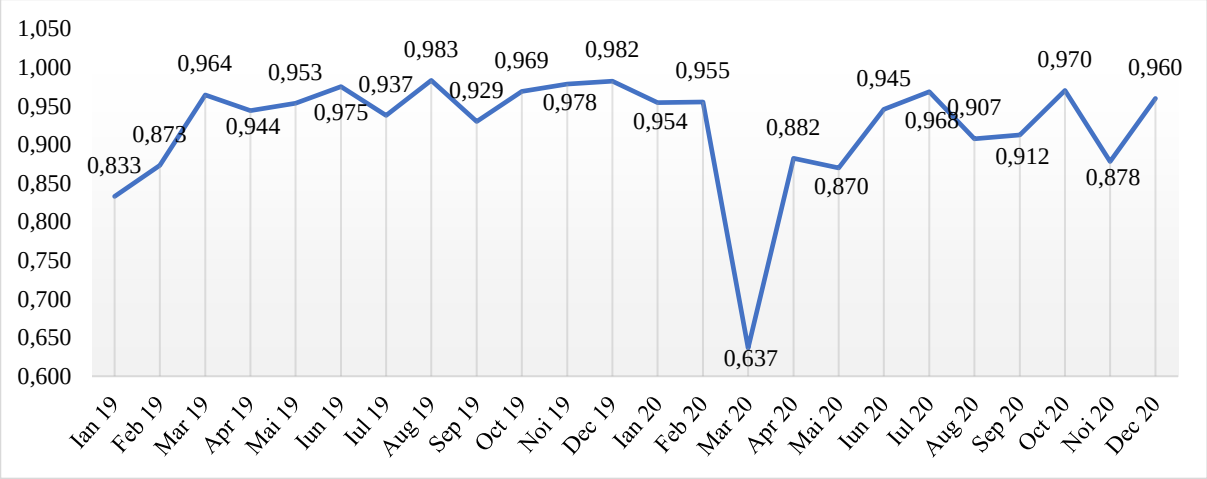

Fig. 1. Determination of the closing price stability indicator (Pi_s)

Source: author processing based on the data provided by the www.bvb.ro portal in the Excel program

It is noted that the lowest value of the closing price stability indicator (Pi_s) is recorded in March 2020. On the other hand, it is noted that the closing price stability is relatively constant for the rest of the period under investigation, being at values between 0.833 and 0.983.

In 2019, the capitalization of the Bucharest Stock Exchange registered an increase of 23.4% compared to the previous year, reaching the value of 37.8 billion euros, supported by high dividend yields, Romania's economic growth (above the EU average), promoting Romania to the status of an emerging market and a series of favorable legislative changes.

In the context of the COVID-19 crisis, the main index of the BET stock exchange decreased by about 25% between December 30, 2019 and March 30, 2020, from an increase of 35.1% recorded in 2019.

In figure no. 2, the volatility of the securities of the companies in the hotel industry and of the restaurants listed on the Bucharest Stock Exchange on the main segment was highlighted, expressed through the coefficient β.

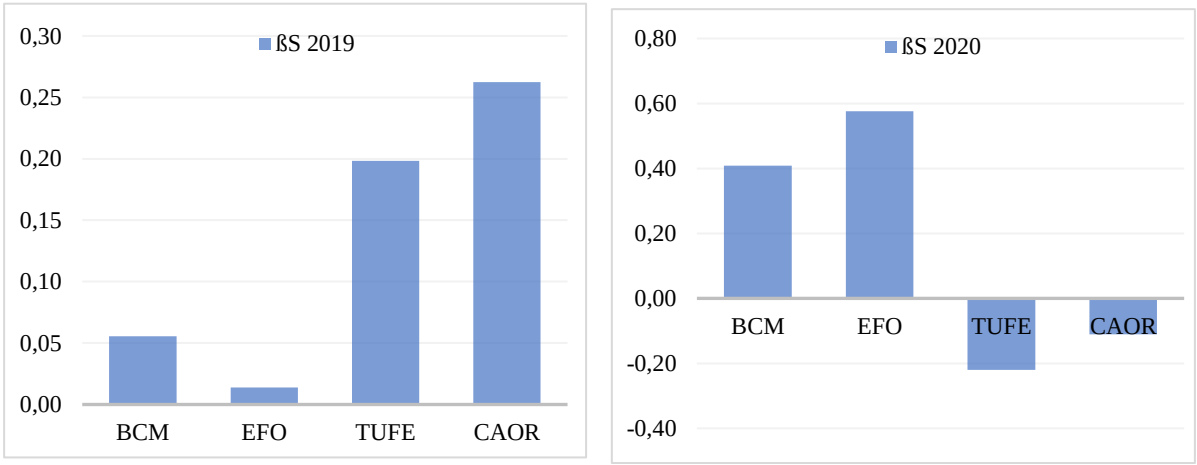

Fig. 2. Volatility (β) of securities of companies in the hotel and restaurant industry
Source: author processing based on the data provided by the www.bvb.ro portal in the Excel program

All four companies included in the research recorded subunit volatilities in 2019 and 2020, which indicates that they had stable prices, and were less volatile with the capital market, respectively a variation of ± 1% of the general stock market index determines a less than ± 1% change in the return on company securities.

The intensity of the correlation between the profitability of the securities of the four companies and the profitability of the capital market, expressed by the correlation coefficient (ρs * p), is presented in figure no. 3.

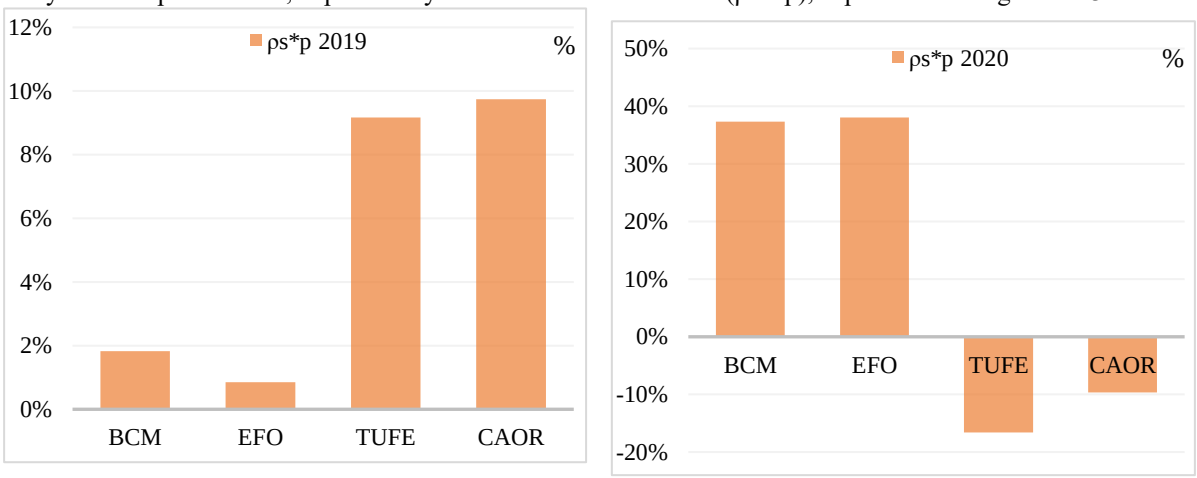

Fig. 3. The intensity of the correlation between the return on securities and the return on the market in 2019 and 2020
Source: author processing based on the data provided by the www.bvb.ro portal in the Excel program

Compared to 2019, the intensity of the correlation between the return on securities and that of the capital market was positive for the four companies included in the research, as follows: 1.82% attributed to BCM; 0.84% attributed to EFO; 9.16% for TUFE; and 9.74% CAOR, respectively. Thus, in 2019, none of the analyzed companies registered a correlation with the market in a negative sense.

During 2020, it is noted that two of the companies registered a negative correlation with the market, respectively -16.58% attributed to TUFE and -9.66% for CAOR. The intensity of the correlation for the other companies is as follows: the return on BCM and the market is 37.34%, respectively 38.05% for EFO.

In figure no. 4 presents the specific risk (σεs) of the securities for the four companies in 2019 and 2020, necessary for the purpose of their valuation.

Do not add any text to the header and footer, not even page numbers.

All submissions are subject to a *blind review process*. Papers will be evaluated for originality, significance, clarity, and contribution. After the official acceptance of your full paper is issued, please complete your registration and hotel reservation.

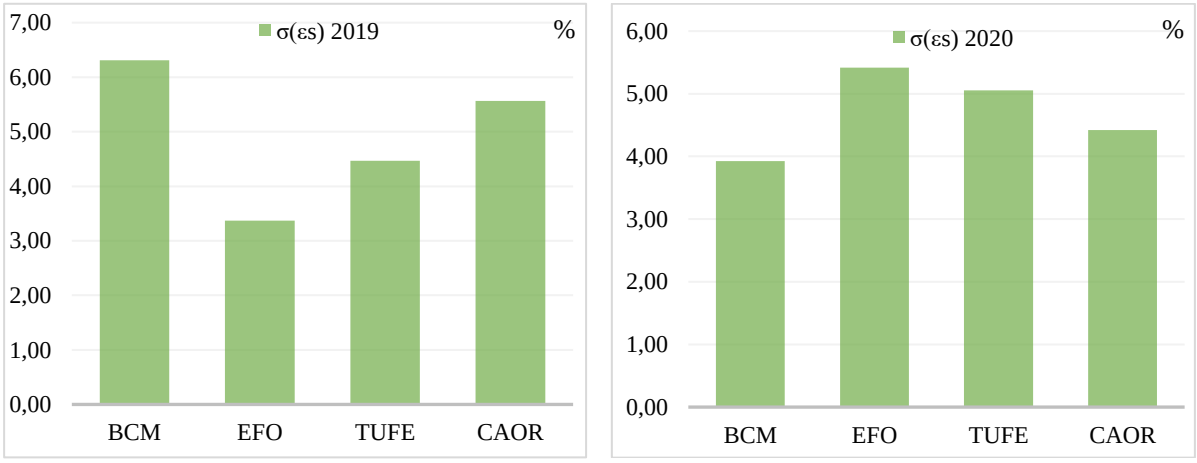

Fig. 4. Specific risk of securities (σεs)
Source: author processing based on the data provided by the www.bvb.ro portal in the Excel program

The companies with the highest specific risk in 2019 were BCM with 6.3%, followed by CAOR with 5.56% and TUFE with 4.47%. The company with the lowest specific risk in 2019 was EFO with 3.36%.

In 2020, the company with the highest specific risk was EFO with 5.41%, followed by TUFE and CAOR. BCM registered the lowest assigned risk of 3.92%.

In order to apply the CAPM model, the interest rate for the last issue of Romanian government bonds (2.5%) was taken into account, as a risk-free rate of return. Since the research is based on weekly data, we determined the weekly interest rate according to the calculation model (Anghelache G.V., Anghel M.G., 2013, p.21):

$$(1+ \text{rata anuală}) = (1 + \text{rata săptămânală})^{52}$$

Thus, following the application of the formula, at an annual interest rate of 2.5% we will obtain a weekly rate of 0.023918606%.

In figure no. 5 shows the evolution of the expected return of the securities portfolio for each company, compared to the expected return of the securities portfolio of the capital market.

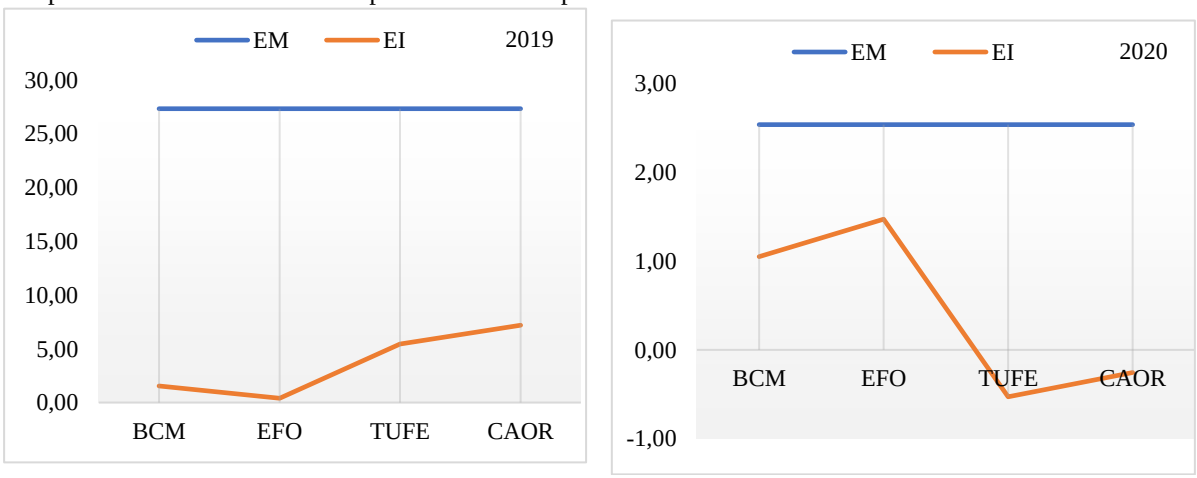

Fig. 5. Specific risk of securities (σεs)
Source: author processing based on the data provided by the www.bvb.ro portal in the Excel program

From figure no. 5, it can be seen that in 2019 and 2020 the financial securities of the analyzed companies were undervalued, the value of EI being lower than the value of EM. In such situations it is recommended to purchase such securities.

The equation of the SML line in 2019 and 2020 calculated for the companies included in the research is presented in table no. 3.

Table 3. The equation of the SML line for the analyzed companies

The equation of the SML line for 2019	
Company	$E_i = R_f + (E_M - R_f) \times \beta_i$
BCM	Ei = 0,02391 + (27,32099- 0,02391) * 0,05548
EFO	Ei = 0,02391 + (27,32099- 0,02391) * 0,01377

TUFE	Ei = 0,02391 + (27,32099 - 0,02391) * 0,19824
CAOR	Ei = 0,02391 + (27,32099 - 0,02391) * 0,26249

The equation of the SML line for 2020	
Company	$E_i = R_f + (E_M - R_f) \times \beta_i$
BCM	Ei = 0,02391 + (2,53928 - 0,02391) * 0,40844
EFO	Ei = 0,02391 + (2,53928 - 0,02391) * 0,57621
TUFE	Ei = 0,02391 + (2,53928 - 0,02391) * -0,21978
CAOR	Ei = 0,02391 + (2,53928 - 0,02391) * -0,11099

Source: author processing based on the data provided by the www.bvb.ro portal in the Excel program

The research fully confirms the hypothesis that in 2019 and 2020 the shares of companies in the hotel industry and restaurants listed on the Bucharest Stock Exchange, on the main segment, were undervalued and the expected return of the portfolio was lower than the expected return of the market portfolio. capital.

5. Conclusions

The current economic context affected by the COVID-19 health crisis has had a direct impact on the evolution of the capital market, due to investors' fears. Against the background of the massive depreciation of the share price, we find that between December 30, 2019 and March 30, 2020, the main index of the BET stock exchange decreased by about 25%, from an increase of 35.1% compared to the previous year, recorded in 2019.

The volatility of the shares is sub-unitary for all the studied companies, with relatively stable prices, and they are less volatile with the capital market, respectively a variation of ± 1% of the general index of the stock market determines a variation of less than ± 1%.

Regarding the intensity of the correlation between the profitability of the shares and the profitability of the market for 2019, it was proved that for all the analyzed companies there is a direct and medium intensity link. Instead, during 2020, it is found that the intensity of the correlation between return on shares and market return is negative for two of the four companies included in the research, respectively -16.58% attributed to TUFE and -9.66% for CAOR.

Despite the criticisms of the CAPM model, especially those related to the variability over time of the β coefficient, and the possibility of being only approximately different stock market indices, it is impossible to know with certainty its value, it remains most often used both for selection portfolios of financial securities as well as for their valuation.

By applying the CAPM model for valuing financial assets for the period 01.01.2019 - 31.12.2020, it was concluded that the shares of the companies studied in this research are undervalued, respectively recorded levels of expected portfolio return, lower than expected capital market return, being recommended in this case their acquisition.

6. References

- Anghelache G.V., Anghel M.G. (2013), *Modele specifice în analiza portofoliului", Economie teoretică şi aplicată Volumul XX*, No. 11(588).
- Altman, Edward I. (1968), *Financial ratios, discriminant analysis and the prediction of corporate bankruptcy*, The Journal of Finance Volume 23, Issue 4 September 1968, https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1540-6261.1968.tb00843.x#.
- Altman, Edward I., (1993), *Corporate financial distress and bankruptcy: a complete guide to predicting & avoiding distress and profiting from bankruptcy*, 2nd edition. USA, NJ: John Wiley & Sons, Inc.
- Balteș Nicolae, Alexandra Gabriela Maria Dragoe (2018), *Performanța financiară în industria prelucrătoare,* Editura Tehno Media, Sibiu.
- Balteș Nicolae, Georgiana Piko (2018), *Poziția și performanța financiară la entități economice aparținând industriei farmaceutice –evoluții și tendințe*, Editura Tehno Media, Sibiu.
- Balteș Nicolae, Maria Daciana Cozma (2017), *Performanță și risc în activitatea bancară,* Editura Tehno Media, Sibiu.
- Balteș, N., Dragoe, A. G. M., & Ardelean, D. I. (2014), *Study Regarding the Assets Evaluation on the Financial Market through the C.A.P.M. Model*. Studia Universitatis Vasile Goldiș Arad, Seria Științe Economice, 24(3).
- Lintner, J. (1965), *The Valuation of Risk Assets and the Selection of the Risky Investments in Stock Portfolios and Capital Budgets*, The Review of Economics and Statistics.
- Mossin, J. (1966), *Equilibrium in a Capital Asset Market*, Econometrica.
- Nagy Ágnes (2013), Importanța deciziilor de politică monetară din punct de vedere al trinității imposibile, Sinaia, 12 februarie 2013.
- Radu Stroe (2000), *Modelarea deciziei financiare, Capitolul III, Modelarea in teoria si practica finanțelor*, ASE București.

- Sharpe, W. (1964), *Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk*, The Journal of Finance, Vol 19, No. 3.
- Treynor, J. (1961), *Toward a Theory of the Market of Risky Assets*, unpublished manuscript.
- Vélez-Pareja, I., Tham, J. (2002), *A Note on the Weighted Average Cost of Capital WACC*, disponibil online la: http://pruss.narod.ru/WACC.pdf.