POSSIBLE CORRELATIONS BETWEEN STANDARD STOCK MARKET ANALYSIS AND ISING-LIKE TYPE ANALYSIS OF SOME GROUPS OF ASSETS AT BUCHAREST STOCK EXCHANGE (BVB)

Dorina Andru Vangheli

West University of Timisoara, Dept. of Physics, Bd. V. Parvan nr 4, Timisoara, Romania

Abstract
In this work we realize an Ising-like type analysis for BVB financial evolution (BET, BET-C and BET-FI indices) considering a group of assets belonging to the financial domain (TLV, BCC, BRD). These results are correlated with those obtained from point of view of financial reports and analysis.

1. Introduction

Throughout the history of modern portfolio theory in financial markets, a lot of literature has tried to identify ways of constructing optimal portfolios, therefore it is of great interest to put into evidence a connection between statistical evaluation in econophysics and stock price changes in real markets. In this work such an analysis is conducted from an Ising-like statistical markets point of view.

2. Results and Discussions

As it was presented earlier [1], our observation is that, if we consider a spin-1 Ising-like model with two type of interactions between spins, for studying the evolution of a financial market, there is possible to introduce two market order parameters which are not independent each-other. So, in our opinion, if we identify some market price evolution parameters, correlated with the <s²> and <s> order parameters, which were defined within the considered Ising 1 model, analyzing their interdependence, which is revealed as existing by the analysis of the Ising-like model, it is possible to obtain information about the tendency of evolution of assets and of the whole market. In some previous articles [2] we tried to apply the ideas above for studying the evolution of two classes of assets and, as a matter of fact, of the market as a whole, at the Bucharest Stock Exchange (BVB). For these reasons, we introduced two market parameters:

$$M = \frac{i}{<i>} \qquad Q = \frac{i^2 - <i>^2}{<i>}$$

where <i> is the BVB index and i is the price of a stock of a given type at a given moment. We studied two kinds of dependences: the M-Q dependence and the I-Imax dependence (we noted I=i²/<i> and Imax=i/imax).

In our earlier works, [2], we demonstrated that it is possible to correlate the real annual market evolution with information obtained from the M-Q dependence. These correlations were evidenced beginning with the year 2005, that means from the year when BVB became a real financial market (in fact it is still considered as an emergent market).

The BVB evolution in the year 2007 [3] was a complex one, when taking into consideration the evolution of different stock classes, as well as correlating its evolution with the evolution of international markets, especially in the last trimester of the year. In these conditions we consider that is of real interest to create a monthly analysis of the M-Q and I-Imax dependencies, and to compare these with the financial reports representing the BVB evolution. For our purpose we created a portfolio consisting of 3 types of assets belonging to the financial domain (TLV, BRD, BCC). The analysis refers to the January 2007 – January 2008 period.

No.	Emitting company name	Symbol	Price change during year 2007	Asset price (%)	Financial evolution
1	Banca Transilvania	TLV	1.01 – 0.9	-10.89%	Performance 33.75%
2	BRD - Societe Generale	BRD	18.5 – 28.00	51.35%	Performance 53.02%
3	Banca Comerciala Carpatica	BCC	0,55 – 0,47	-13.82%	Low Performance 7.53%

The BVB evolution financial reports [3] put into evidence the following:

- After a normal evolution in the first 2 trimesters of 2007, there is a drastic fall of activity in the months November and December, a trend which continues in the month of January 2008. From the Figures 1 and 2, which represent the monthly dependencies of M-Q and I-Imax, respectively, for the BET index, it can be seen that the M-Q representation does not differ from one month to another, while the I-Imax representation differs significantly, therefore we will focus on the latter type of representations.
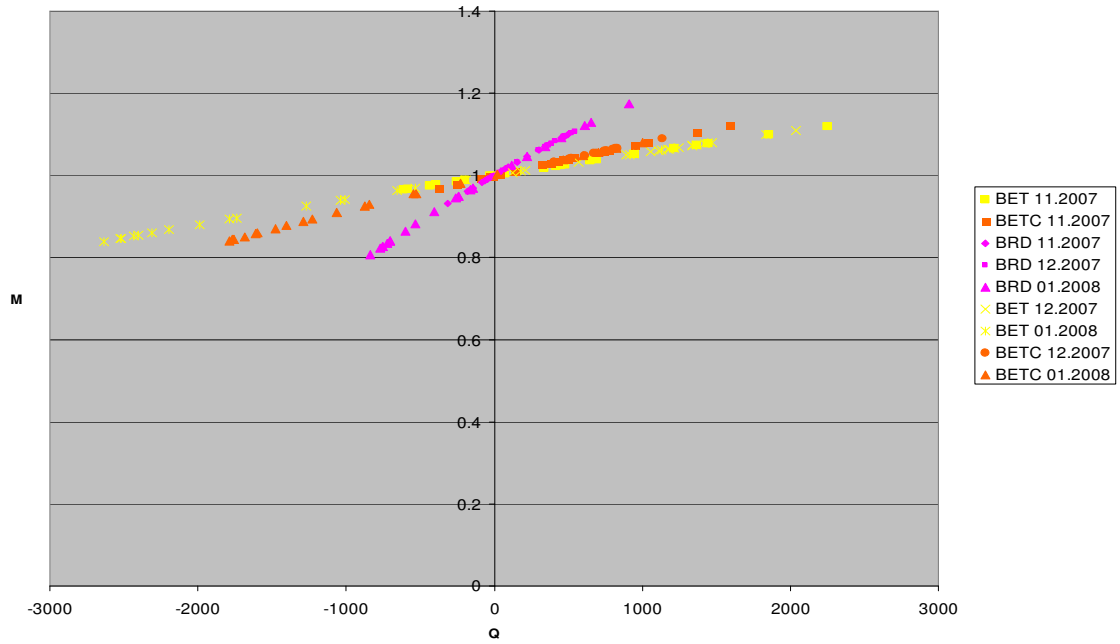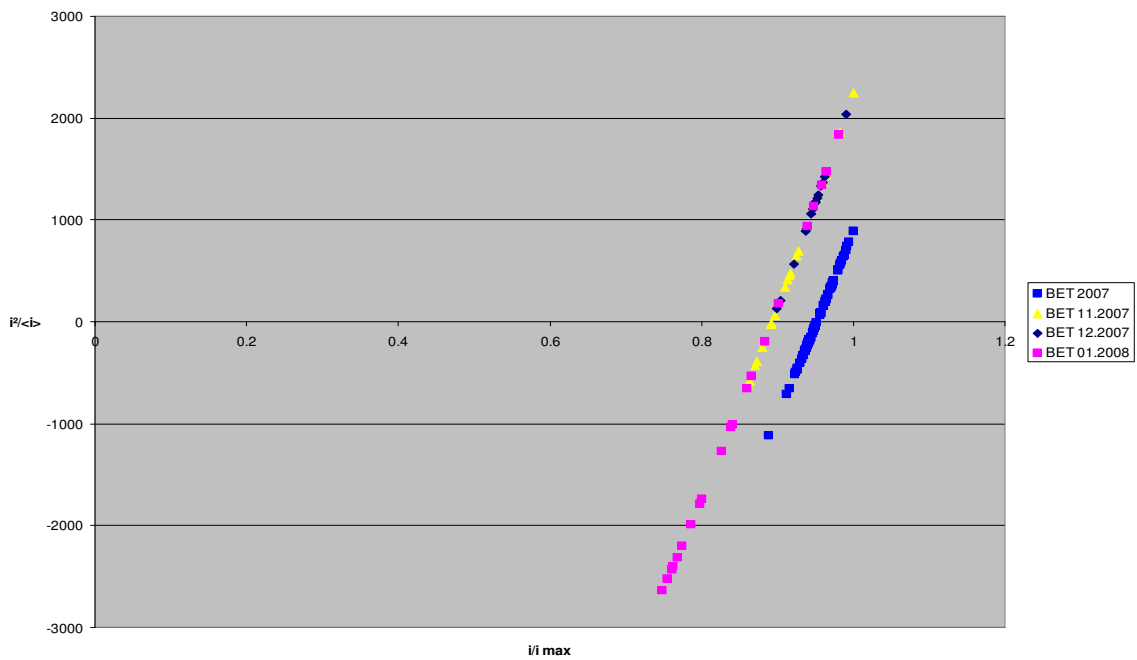
Figure 1

Figure 2

- We can see a good correlation of the BVB evolution with some of the advanced markets, the best correlation being made with the US market, between the BET and Dow Jones indices there is a correlation index of 0.52 (this phenomenon is due to the placements of nonresidential investors). This correlation can be observed in Figure 3
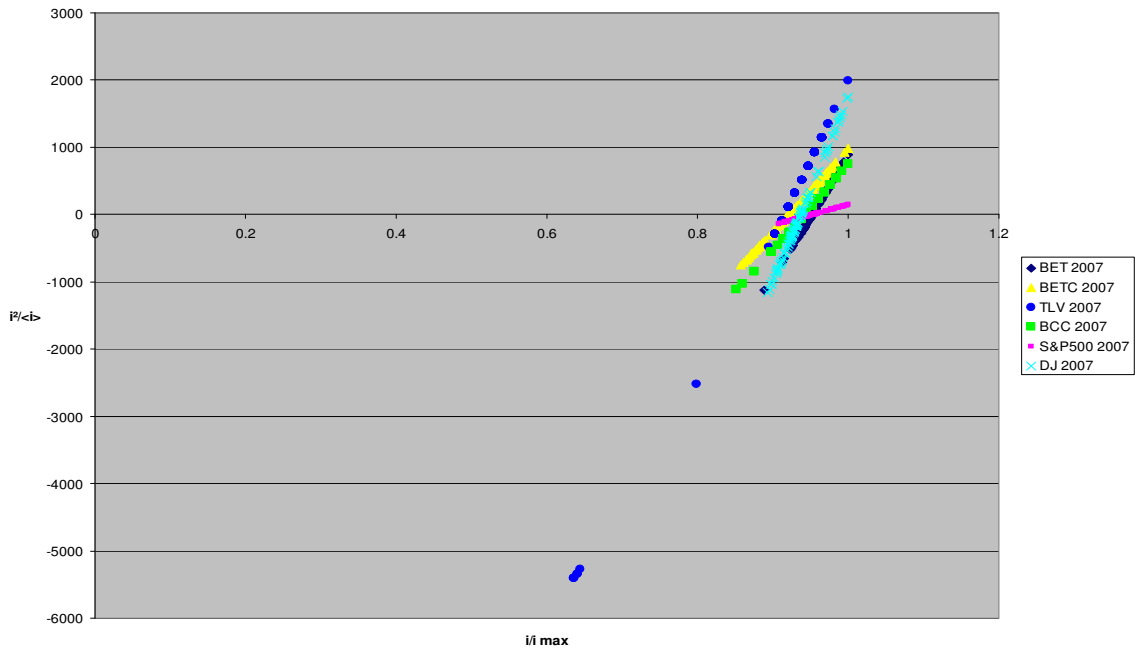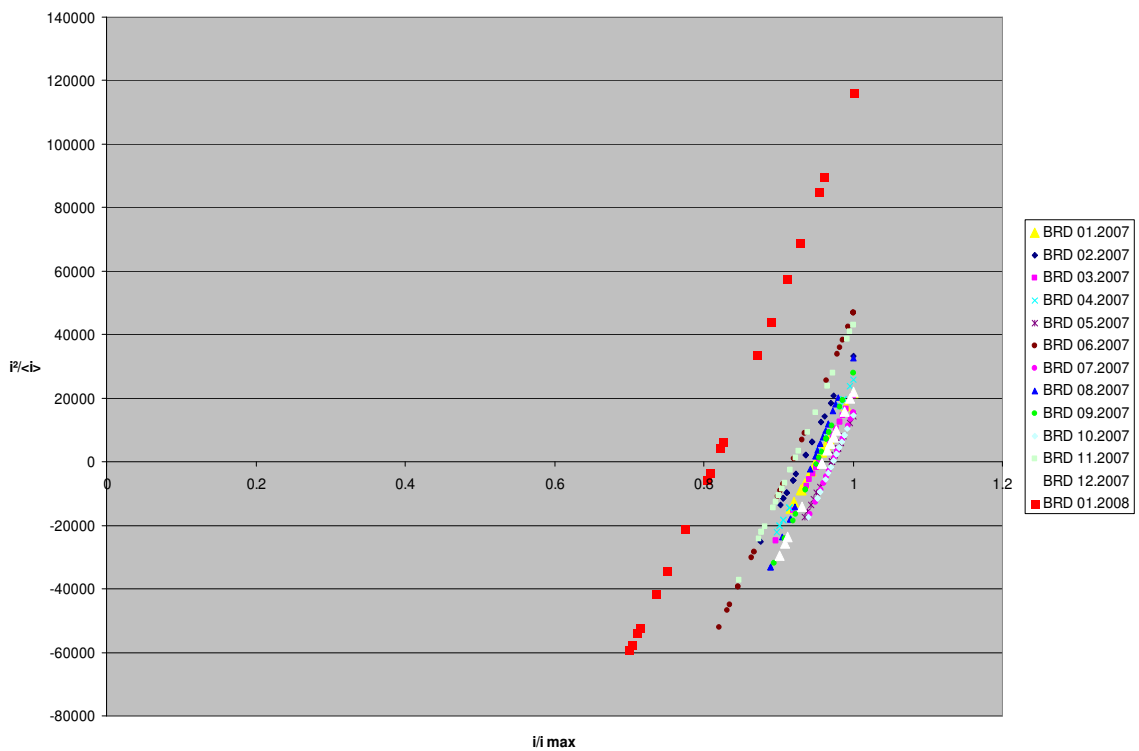
Figure 3

Figure 4

The evolution of the BRD stocks in 2007 had significant monthly fluctuations, therefore, even if, globally, BRD ended the year with a positive financial situation, the price of stocks in the months of October and November had a decreasing trend, based on

unfavorable international politics and the news regarding the intention of BNP Paribas of buying Societe Generale, the main stock holder in BRD. At the end of 2007 there was a slight improvement of the bank's situation, probably because of international financing by powerful banks such as BERD, EFSE and ABN AMRO BANK. At the beginning of 2008 there is an increase in the volatility of stock prices, based on the news regarding the major financial fraud that hit the main stock holder, Societe Generale. The above considerations are perfectly mirrored in the I-Imax monthly dependency shown in Figure 4.
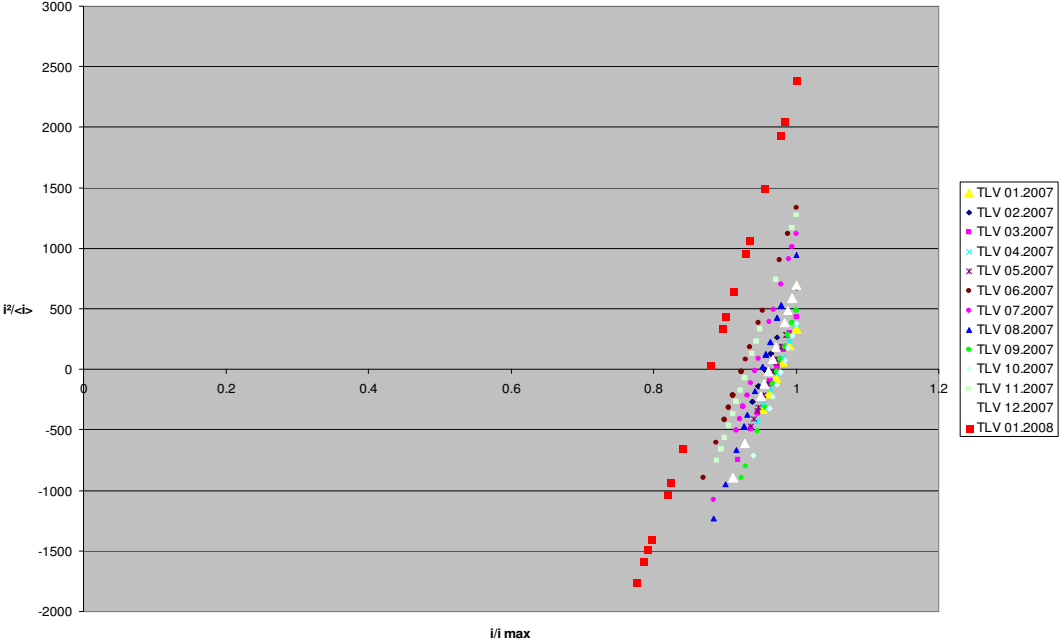

Figure 5

- The monthly evolution of the I-Imax dependency for the stock prices of Transilvania Bank (TLV), presented in Figure 5, also reflects the information of the BVB reports. According to them, for the first 3 quarters of the year there is a normal evolution, followed by a downfall in the month of November and an ascending trend in December, the last being explained by a period of rapid dynamics of the bank. Even if at the beginning of 2008 the trend of stock prices becomes descending again, overall the Transilvania Bank has a positive evolution.

- The third bank listed at BVB, the Carpatica Commercial Bank (BCC), had a much weaker evolution in 2007, having a negative trend in the entire interval January 2007-January 2008, situation which is also put into evidence in the I-Imax monthly dependency shown in Figure 6
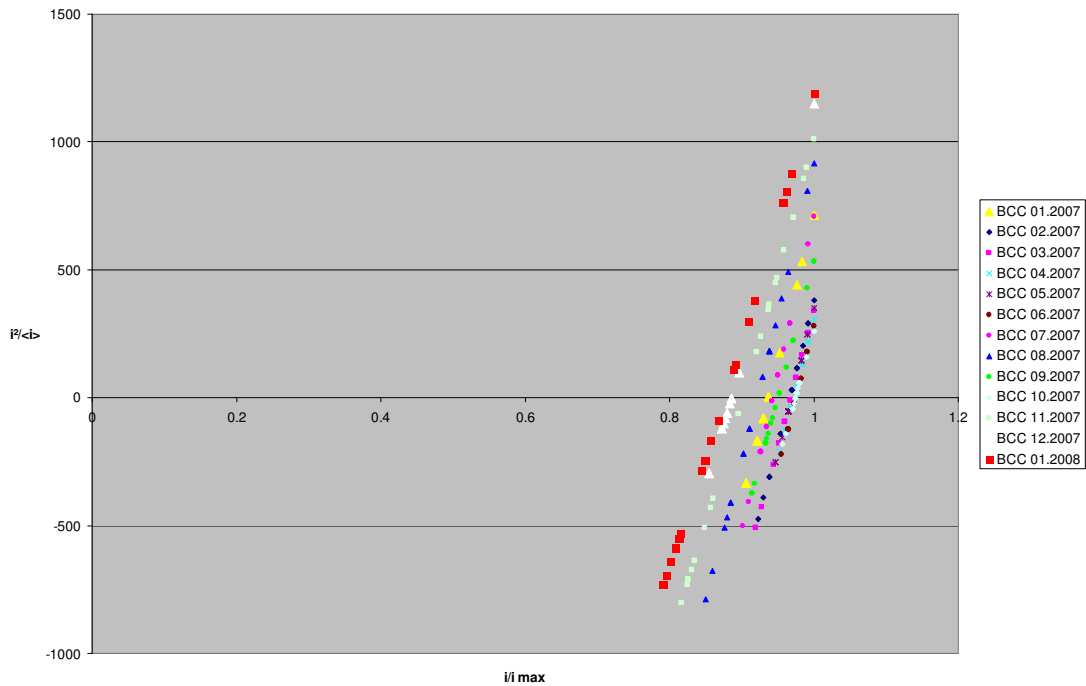
Figure 6

3. Conclusions

The examples in the financial domain analyzed by studying the Ising-like parameters introduced by us, show that some of them can be successfully used in studying the evolution of financial markets, being totally compatible with the results of elaborate financial analysis conducted by financial market specialists.

References

1. Dorina Andru Vangheli, Analele UVT, Seria Stiinte Fizice, vol. XLI, pag.58 (2000)
    Dorina Andru Vangheli, Analele UVT, Seria Stiinte Fizice, vol.44, pag.106 (2003)
2. Dorina Andru Vangheli, Analele UVT, Seria Stiinte Fizice, vol.47, pag.88 (2005)
    Dorina Andru Vangheli, Analele UVT, Seria Stiinte Fizice, vol.48, pag.163(2006)
3. *** MarketStatistics www.bvb.ro
    *** AnalizaTehnica www.estinvest.ro
    *** Documentare si Analiza www.kmaret.ro