

**ISING-LIKE TYPE ANALYSIS OF SOME GROUPS OF ASSETS AT BUCHAREST
STOCK EXCHANGE (BVB)**

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Abstract

In this work we realize an Ising-like type analysis for BVB financial evolution (BET, BET-C and BET-FI indices) considering, in particular, two groups of assets, belonging to petroleum domain (SNP, RRC, PTR) and, respectively, to financial one (TLV, BRD, BCC). These results are correlated with those obtained from point of view of financial reports and analysis.

Until 2004, for investors, Bucharest Stock Exchange (BVB) was not a very attractive market (it was determined as an emerging one). The question that aroused was why investors would choose the stock market since they can be better off by choosing riskless assets (like T-bills). At this time, when BVB became a mature market, there is a theoretical solution (the Markowitz modern portfolio theory) for this problem, that the investors could construct optimal portfolios. There is a lot of literature which tries to identify ways in constructing optimal portfolios. However, in practice, many models, even though perfectly logic as construction, tend rather to fail.. There are some reasons for it, like: they all have a set of assumptions that cannot depict the whole reality, many of them being static, there is a lot of noise in data, the high volatility is a constant obstacle for realizing some predictions for market evolution, etc.

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, there are two order parameters which are not independent each-other. So, in our opinion, if we can identify some market price evolution parameters, correlated with the $\langle S^2 \rangle$ and $\langle S \rangle$ order parameters, which were defined within the Ising 1 model [1], analyzing their interdependence, which is revealed as existing by the analysis of the Ising-like model, we can obtain information about the tendency of evolution of assets and of the whole market. From these reasons, we introduce two market parameters

$$M = \frac{i}{\langle i \rangle} \quad Q = \frac{i^2 - \langle i \rangle^2}{\langle i \rangle}$$

where $\langle i \rangle$ is the BVB index and i is the price of a stock of a given type at a given moment.

For our purpose we created a portfolio consisting of 6 types of assets divided into two groups, the first belonging to the petroleum domain (SNP, RRC, PTR) and the other to the financial domain (TLV, BRD, BCC).

The analysis refers to the entire year 2005 and the January 3rd-November 15th 2006 period.

The M-Q analysis is presented in the following graphs:

Figure 1 presents the M-Q diagrams which were obtained for the six types of stocks which form the portfolio, for the year 2005. It can be seen that, for BRD, two diagrams are presented, of different inclinations, and we consider that they reflect the modification of its capitalization that took place in 2005.

As it can be seen from figure 2, in 2006, the six portfolio components present the same diagrams, but the anomaly related to the BRD being no longer present, and the BRD diagram's slope being different than the one for the other 5 stocks.

Considering that the evolution of stocks in the chosen portfolio are contained in the BET (SNP, RRC), BET-C (all), and BET-FI (BRD, TLV, BCC) indices of the BVB, the M-Q diagrams have been represented for the all three BVB indices, and also for the DJ and SP&P of the New York Stock Exchange. Therefore in figures 3 and 4 the two diagrams for the DJ and, respectively, SP&P indices are presented, for the same intervals, 2005 and 2006 years, and in figure 5 is realized a comparison of these indices with the ones of the BVB. It can be seen that the two reference indices diagrams overlap almost perfectly for the selected two year span.

In figures 6 and 7 the evolutions of the banking stocks are being presented for 2005 and 2006, along with the BET-FI index.

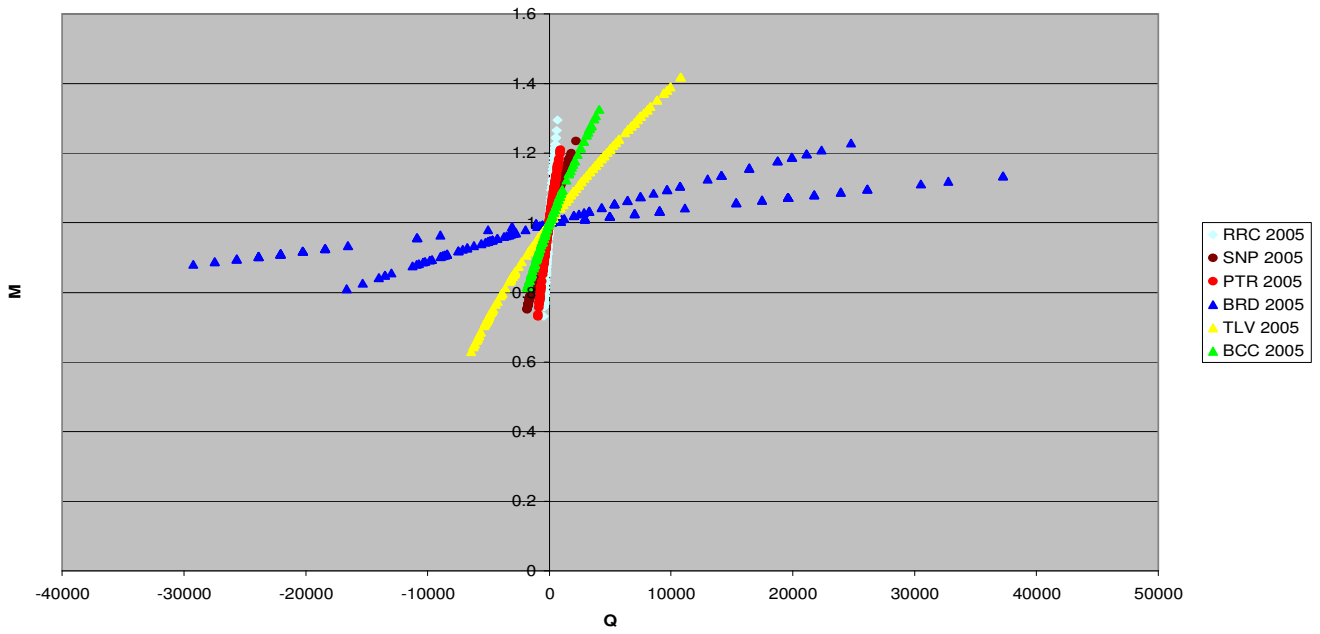


Fig.1 The M-Q dependency for RRC, SNP, PTR, BRD, TLV and BCC in 2005

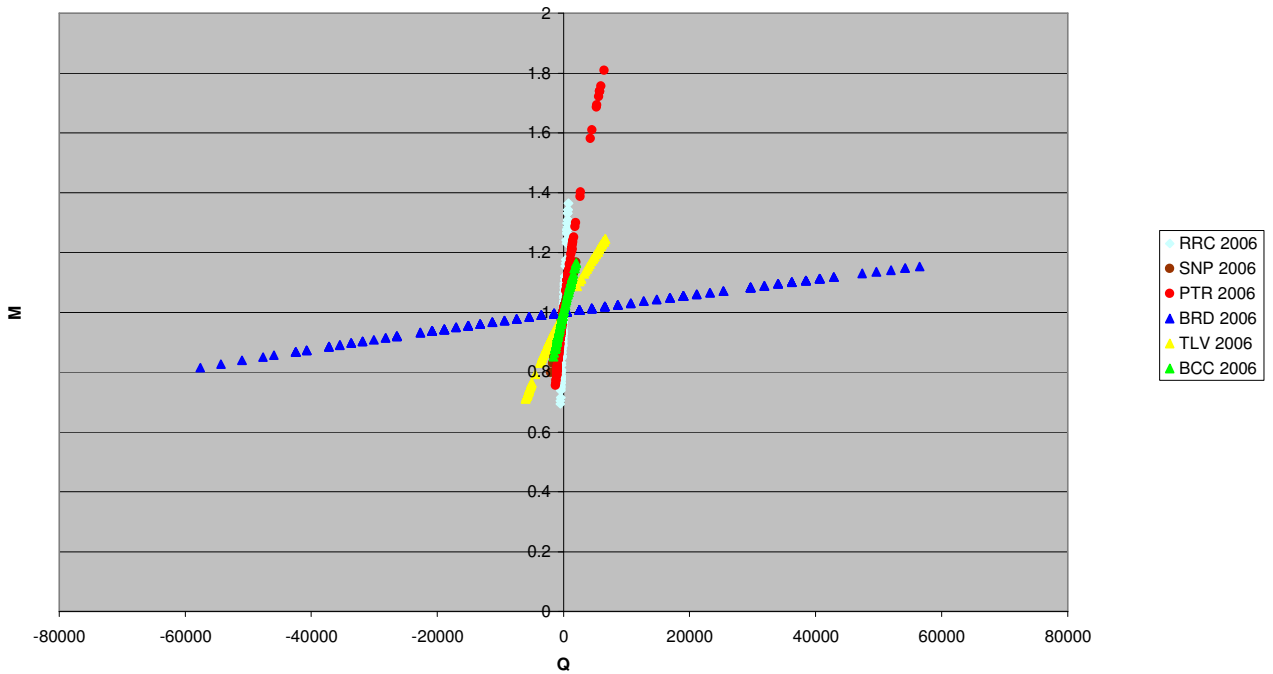


Fig.2 The M-Q dependency for RRC, SNP, PTR, BRD, TLV and BCC in 2006

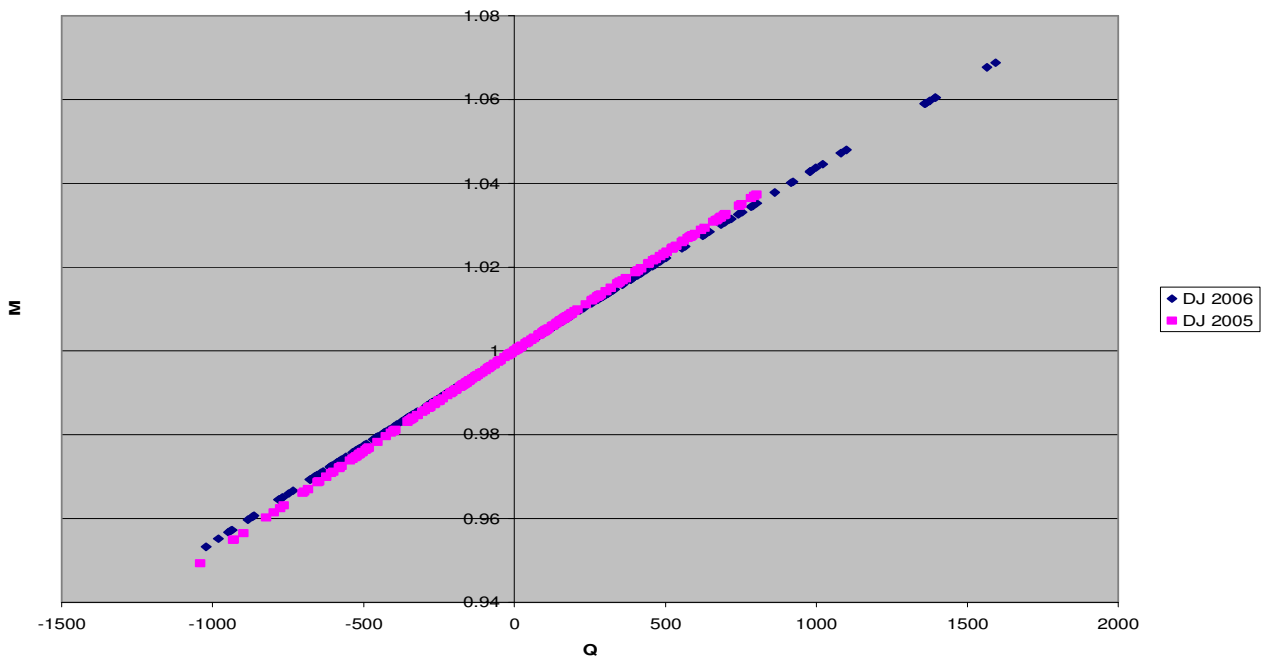


Fig.3 The M-Q dependency for the Dow Jones index in 2005-2006

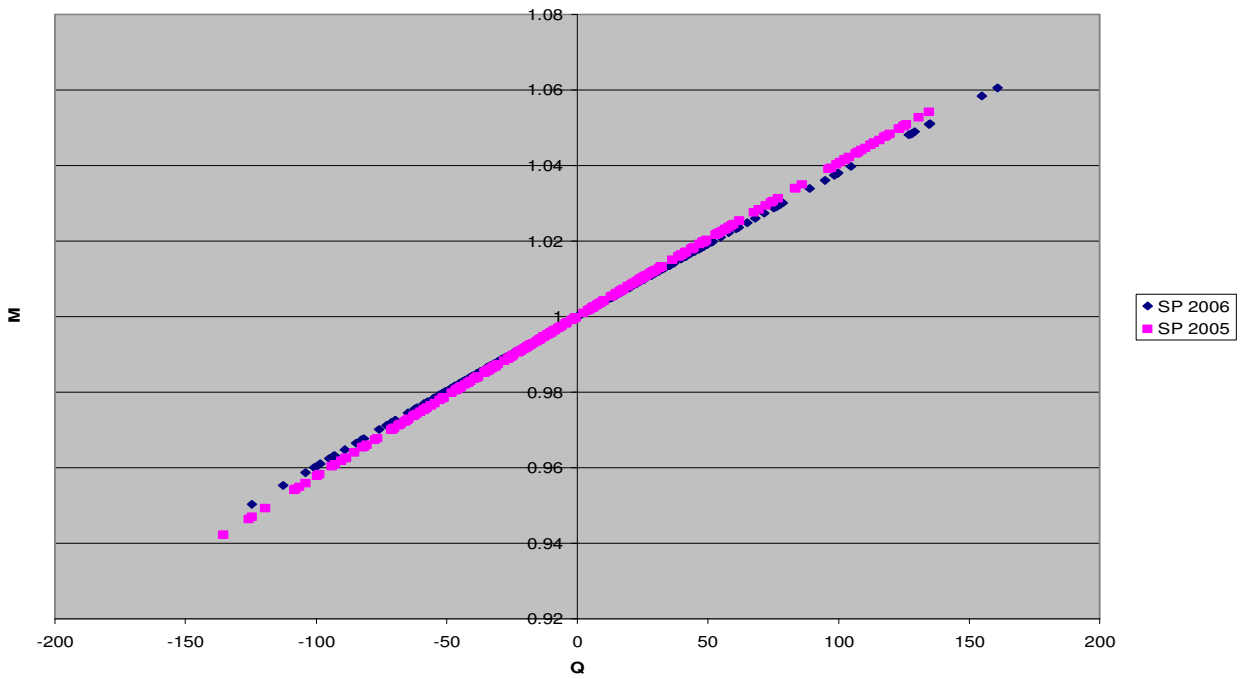


Fig.4 The M-Q dependency for the S&P500 index in 2005-2006

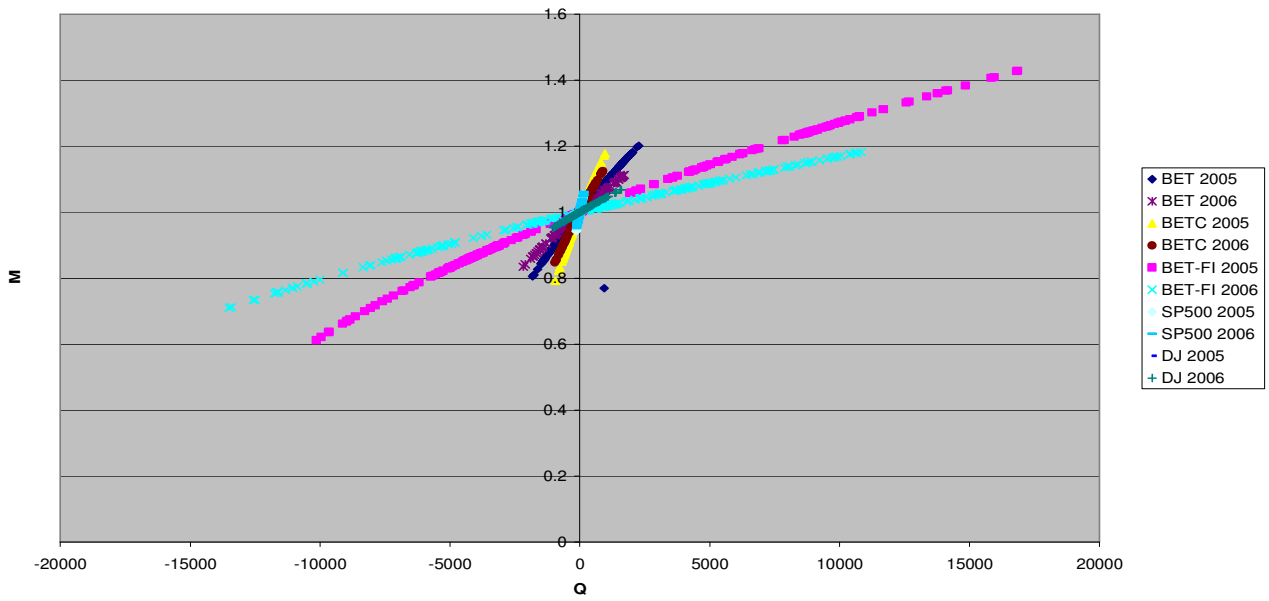


Fig.5 The M-Q dependency for BET, BETC, BET-FI, S&P5-00 and DJ in 2005-2006

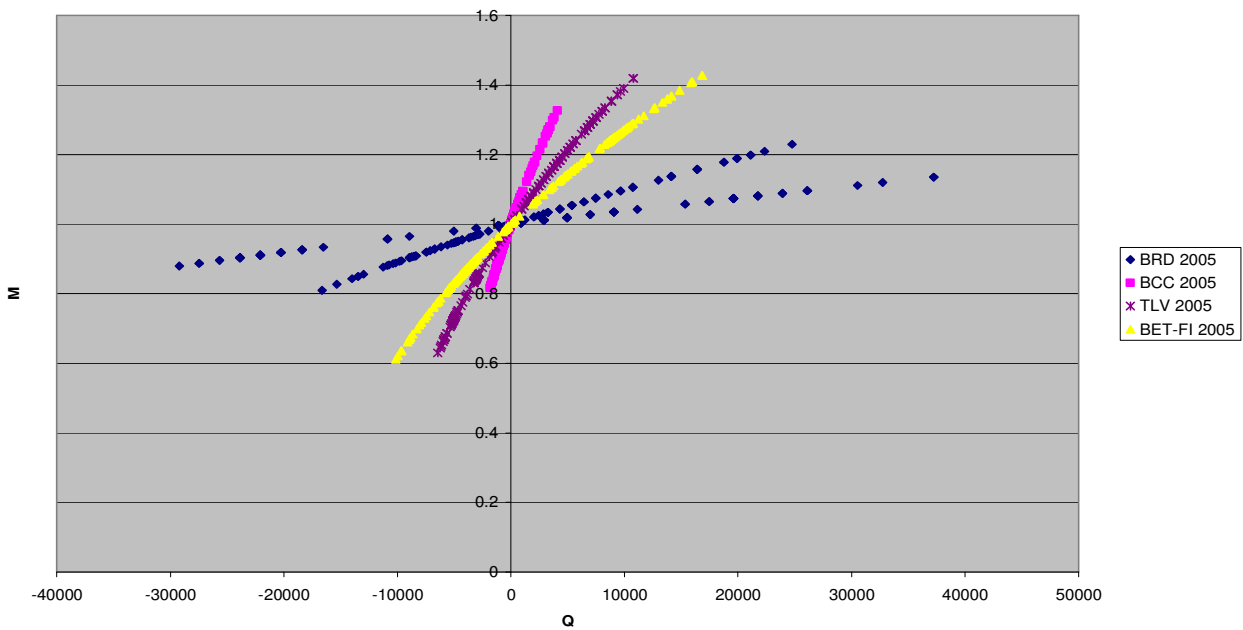


Fig.6 The M-Q dependency for the financial stocks in 2005

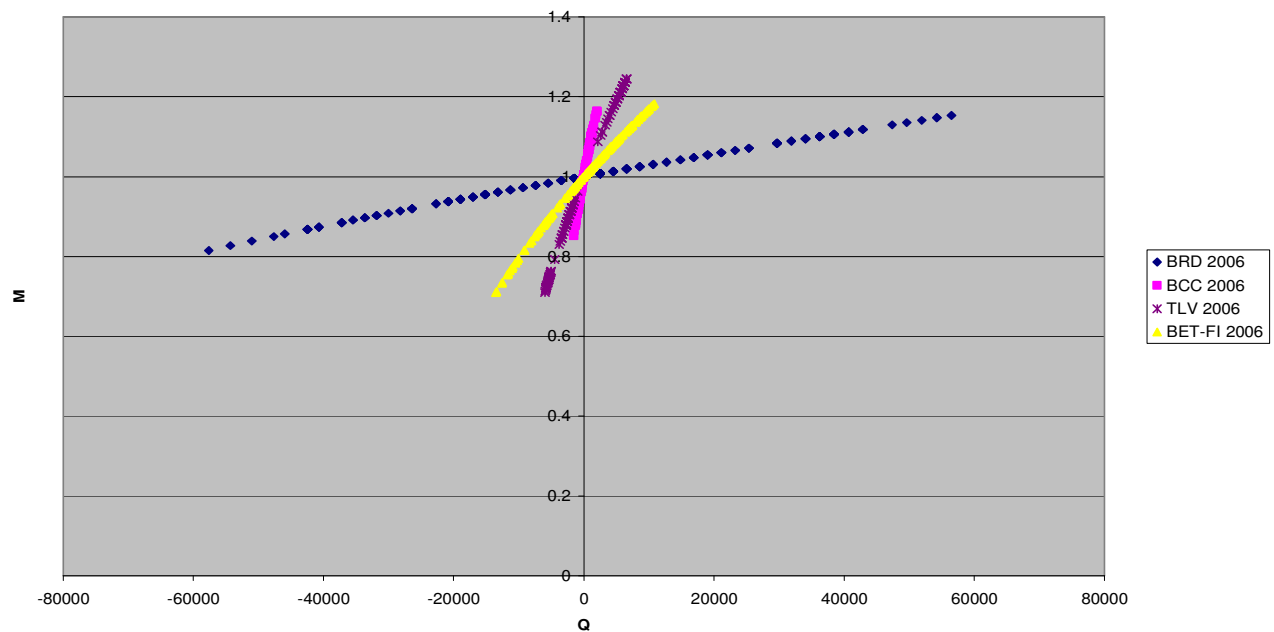


Fig.7 The M-Q dependency for the financial stocks in 2006

The BVB M-Q diagrams are compatible with the information obtained from the banking reports and analysis over 2005 [2], [3].

No.	Emiting company name	Symbol	Price change during year 2005	Asset price (%)	Financial evolution
1	Banca Transilvania	TLV	1,04 – 1,24	15,29%	Performance 103,57%
2	BRD - Societe Generale	BRD	4,00 - 13,7	71,25%	Performance 74,03%
3	Banca Comarcial Carpatica	BCC	0,5 – 0,58	16%	Low Performance 30,94%
4	Petrom	SNP	0,35 – 0,47	36,68%	Performance 37,81% Excellent financial results at the end of 2005
5	Rompetrol Well Services	PTR	0,14 – 0,21	50,35%	Financial results better than in previous years
6	Rompetrol Rafinarie Constanta	RRC	0,09 – 0,109	15,96%	Descending evolution caused by government investigation

It can be seen that the 3 types of banking stocks from the first category present an evolution resembling the BET-FI index, which had a 175,24% increase in 2005, to which they contribute both with the SIF companies. This is important because the weight of these companies within the BET-FI index is significantly lower than the one of the SIF companies.

For the petroleum companies from the second group, the evolution is virtually identical, without significant financial events.

It is obvious that there is an almost linear dependency on the central portion of the M – Q dependence for BVB indices, and for comparison, this dependency is presented in the case of the Dow Jones and SP&P 500 indices, where this rule seems to be the same.

References

- [1] Dorina Andru Vangheli, Analele UVT, Seria Stiinte Fizice, vol. XLI, pag.58 (2000) and vol.44, pag.106 (2003)
- [2] ***Market Statistics www.bvb.ro
- [3] ***Documentare si analiza www.kmarket.ro
- [4] Dorina Andru Vangheli, Analele UVT, Seria Stiinte Fizice, vol.47, pag.88 (2005)