

SYNOPSIS 2015

GRANT CNCS UEFISCDI - PN-II-RU-TE-2014-4-1827

Title of the project: **The herding behavior on financial markets: a game theoretical approach and empirical evidence**

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1. Two draft articles¹

1.1 Angela Maria FILIP, Andreea Maria PECE, Maria Miruna POCHEA, “*Testing herding behavior in CEE Countries: a quantile regression analysis*”.

1.2 Adrian ZOICAȘ-IENCIU “*Trading timing and the returns to technical analysis*”.

Both articles are available upon request. In what follows we present the realization of the objective and of the associated activities in relationship with the draft articles.

Summary – for the draft: “Testing herding behavior in CEE Countries: a quantile regression analysis”

Activity 1/2015: *Relevant literature review, analysis of game theoretical models previously proposed in the literature in order to explain herding behavior and detection of drawbacks in the existing statistical methodologies*

Despite the existence of a vast literature on market anomalies, it is still difficult to explain why human behavior invalidates the hypothesis of the traditional financial theory. The paradigms of traditional finance state that investors act perfectly rational and financial decisions substantiate the efficient market hypothesis. The EMH and its shortcomings have been intensively debated in the literature. A more realistic paradigm, supported by theoretical and experimental developments of the psychology literature (see Kahneman and Tversky, 1979; Bernstein, 1998; Kahneman and Riepe, 1998; Kahneman and Tversky, 2000) seeks to expand the boundary of traditional finance, by abandoning the hypothesis of perfect rationality. Behavioral finance offers a more realistic approach to the decision making process, by

¹ All the working papers mentioned at this section refer in the “acknowledgement” to the project CNCS – UEFISCDI, PN-II-RU-TE-2014-4-1827.

integrating human emotions such as anticipation, fear, greed, optimism, panic, etc. Our working paper “Testing Herding Behavior in CEE Countries: a Quantile Regression Analysis” investigates one of the most significant behavioral biases, generated by human emotion – herding behavior on financial markets. Herding behavior refers to mimicking the decisions of other investors, regardless of personal information and expectations. This phenomenon generates common actions which are likely to drive away the stock prices from their economic fundamentals. Traditional causes of herding include intrinsic preference for conformity, doubt concerning the manager’s skills, the perception that others are better informed, imperfect information, the additional costs of new information and compensation structures in case of money-funds managers.

Note: The list with the mentioned references is available upon request.

Activity 2/2015: Empirical testing of herding behavior for individual and institutional investors

Empirical research on herding behavior, although prolific, has neglected so far the European emerging markets. The existing literature is mainly focused on Asian and US capital markets. More than that, on emerging and frontier capital markets, the information is incorporated more slowly in stock prices, offering a productive ground for investigating herding behavior. Our paper fills a gap in the literature, by testing herding behavior in ten CEE countries (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia, based on daily data, during January 2, 2003 – December 31, 2013). In order to provide a more profound analysis, we have analyzed herding behavior under different market conditions such as bull/bear market, high/low volatility, and high/low trading volume. Our study is based on the CSAD methodology (cross-sectional absolute standard deviation) developed by Chang et al. (2000). Barnes and Hughes (2002) argue that the quantile regression analysis is more suitable than the ordinary least squared method (OLS) in analyzing the dispersion of the returns in the distribution tails. The OLS estimators are based on the mean as a measure of location, omitting information about the tail of the distribution. To overcome these drawbacks of the OLS and for a deeper analysis of the response of the CSAD to market movements, we used the quantile regression analysis as an estimation method. Our results show that herding behavior was present on all CEE capital markets, except for Poland and Romania. The capital markets of Estonia and Latvia are characterized by herding behavior at almost all quantile levels. In Slovenia we identified herding in the quantiles up to the median ($\tau=10\%, \tau=25\%, \tau=50\%$). In other markets, herding behavior was an isolated phenomenon (Czech $\tau=10\%, \tau=90\%$; Croatia $\tau=25\%$; Hungary $\tau=10\%$; Latvia $\tau=25\%$). In most CEE countries, herding behavior is present in bear markets. Under certain market conditions, such as bull/bear, we identified mimicking investment behavior even in Poland. Latvia is the single CEE country in which herding

behavior is present under both bull and bear market states. The results of the Wald test didn't show a significant difference in the coefficients of herding, so this phenomenon is present on the Latvian market regardless of the overall up or down trends. Surprisingly, we didn't identify herding behavior in Romania, not even under excessive volatility. Yet, under a high trading volume, for the quantile of 25% we obtained a significant herding coefficient. Our results are significant for academic researchers, practitioners and policy makers. Researchers are concerned with the impact of herding behavior on stock prices, returns and risks. Empirical evidence on this subject offers essential information for stock valuation. Practitioners are interested in taking advantage of price deviations from the intrinsic values through profitable investment strategies. Last but not least, for policy makers herding behavior is important as it has a dangerous potential of destabilizing and deteriorating the financial system.

Note: The list with the mentioned references is available upon request.

Summary – for the draft “Trading timing and the returns to technical analysis”

According to the efficient markets theory, the investors' departures from rationality are marginal and short lived, being eliminated through the actions of specialists. In such a framework, irrational behavioral biases like herding cannot be significant. In the same time, the profits associated to pseudo-scientific forecasting methods from which technical analysis distinguishes, should also be insignificant.

Activity 1/2015: Reviewing the literature (on the interdependencies between herding behavior and technical analysis). The experience of the last two decades clearly indicated that technical analysis tools constitute an excellent platform for spreading the herding behavior across capital markets decisions. Thus, thousands of amateurs-investors trade financial assets on a daily basis by exclusively using technical indicators. By simultaneously following the same ultra-popularized indicators and rules, these investors completely ignore the fundamental information behind the assets' value. The main consequences of herding behavior via technical analysis are: 1) an increased volatility in the price and volume series; 2) a detachment of the price evolutions from the assets' economic and financial value fundamentals; 3) an amplification of the intensity of over and underreaction episodes; 4) a higher probability for forming long term speculative irrational bubbles to form; 5) a distortion of the competitive and efficiency based capital allocation. One of the main reasons for which investors use the tools of technical analysis is the assiduous advertisement, including the presentation of academic research whose results appear to confirm their profitability. Currently, there is a substantial body of mixed evidence in the technical literature. Nevertheless, there are well documented empirical proofs raising questions regarding the real utility of technical trading rules. The most relevant two research areas show that: 1) the profitability of technical analysis has reduced in the last years and 2) the positive abnormal returns generated the technical rules

are mostly illusory. The paper “Trading timing and the returns to technical analysis” relates to the second research area, proposing to show that a technical trading rule can also artificially appear profitable only because of empirical settings that oversimplify or contradict real world trading conditions. The paper analyzes the performance of the moving average rule across two distinct empirical settings: an ideal framework with perfect timing where the same price is both a transaction trigger and a transaction price, and a more realistic representation with delayed trading and informed investors.

Activities 2 and 3/2015: Empirical tests for herding behavior (via technical analysis, the proposed model being dynamic in time). The paper shows that the rule’s performance is always reduced when imposing more realistic assumptions. Moreover, there are frequent cases where the rule is successful under the ideal framework but unsuccessful with realistic assumptions, while the reverse seldom happens. In particular, the rule’s ability to generate buy and sell returns that are significantly different from the buy-and-hold returns, almost disappears with realistic trading. This paper brings several contributions to the existing literature. First, it shows that under realistic trading conditions, one-day exposures are always the result of a false signal (i.e. an inaccurate indication of future price movements that contradicts the economic reality). Moreover, one-day exposures are generally cost-inefficient. Informed investors mitigate the risk of following false signals by using various confirmation criteria before changing their current exposure. Although not considered in empirical tests, these additional confirmations actually make the one-day exposures a very unlikely scenario in practice. Consequently, this paper revises the representation of the realistic trading timing framework: besides introducing a one-day delay, it prevents the occurrence of one-day exposures. Second, it evaluates the rule’s performance controlling for the influence of trading costs, net interest (we assume a borrowing rate distinct from the depositing rate) and risk. The negative impact of realistic trading timing holds regardless of the profitability measure: excess return with or without trading costs and interests, Sharpe ratio, break-even trading cost, statistical significance of conditional returns. Third, we evaluate the rule’s performance over a large set of economically justifiable parameterizations that objectively cover the calibrations used in practice. In this way, the study avoids any arbitrary choices in selecting the tested parameterizations and evaluates the impact of trading timing in the case of a generic investor. We analyze the rule’s performance based on mean values across this universe of parameterizations but also by looking at the performance of every individual parameterization.

2. Web page of the project: <https://econ.ubbcluj.ro/PN-II-RU-TE-2014-4-1827>

The web page has the following structure: *Financing institution; Project code; Number of the financing contract; Title of the project; Description of the project (abstract); Research team; Expected results; Results*. The mentioned information is available both in Romanian and English.

Conclusion

I consider that the objective and the associated activities are completely fulfilled according to the proposed plan in the contract. The final result (corresponding to the objective) for the year 2015 consists of:

- two draft articles in extenso, which are including the literature review on issues specific to this project;
- web page of the project;
- activity report.

Cluj Napoca,

25.11.2015

Director,

Cristian M. Litan