Scientific and Technical Report

Execution stage 2/2021

Project title: The nexus between investor sentiment and equity market dynamics. A new sentiment indicator approach.

Project code: PN-III-P1-1.1-TE-2019-1702.

Contract number: TE 38/2020.

Funding period: September 15, 2020 – September 14, 2022.

Project leader: Associate Professor Maria Miruna POCHEA.

Team (alphabetical order): Daniela CATAN, Angela Maria FILIP, Cristina HARIN, Cristian Marius LITAN, Mihai NIȚOI.

The main goal of this project is to investigate the impact of investor sentiment indicators on equity markets and financial stability in Europe.

The second stage of the project, carried out between January 1 to December 31, 2021, was focused on designing an aggregated sentiment indicator at country level and on exploring the relationship between investor sentiment and equity market dynamics in Europe (to be continued in 2022).

The following main activities (A) have been developed throughout this stage:

A2.1 Identifying new dimensions of investor sentiment such as behavioral factors (psychological, social, cognitive, and emotional) national culture, political climate, and reaction to news.

A2.2 Construction of a media sentiment component by using the dictionary-based approach and the machine learning techniques.

A2.3 Combining all the investigated factors and defining the aggregated sentiment indicator at country level.

A2.4 Analyzing the effects of investor sentiment on risk aversion and time-varying idiosyncratic volatility.

A2.5 Investigating the role of investor sentiment in forecasting equity risk-premium.

A2.6 Studying the relationship between investor sentiment and herding behavior in European equity markets.

A2.7 Evaluating the implications of investor sentiment on the stability and integration of European equity markets.

The objectives and activities associated to this stage have been entirely accomplished according to the work plan, and the scientific results available on demand[1], are the following:

I. **1 paper** published online in a **Web of Science indexed journal**[2].

II. **4 papers under review** in **Web of Science indexed journals**.

III. **1 paper accepted** for publication in **international databases indexed journal**.

IV. **2 papers under review** in **international databases indexed journals**.

V. **3 working papers** in extenso.

VI. **Research and documentation stages** at prestigious universities abroad.

VII. **Results dissemination through participation in prominent international conferences.**

In the following, we will present our scientifical results in relation to the above-mentioned objectives and activities associated to this stage.

I.1. **The nexus between bank connectedness and investors' sentiment** (accepted for publication and published online in *Finance Research Letters, Available online 11 September 2021, 102432, link: https://www.sciencedirect.com/science/article/abs/pii/S1544612321004219*)

Authors: *Mihai NIȚOI, Maria Miruna POCHEA*

This paper explores European bank connectedness built on the idiosyncratic returns and proposes an alternative systemic risk measure based on sentiments. The results show that banks in developed European countries form a large network, alongside the U.S. banks, while banks in European catch-up countries are gathered in their own clusters. The spillovers received by the European banks from the U.S. are higher compared to those received by the U.S. banks from the European banks. The network connectedness is sensitive to the nature of each crisis. The TRMI financial sentiment index proves to be a suitable proxy for the systemic risk. **(A 2.4; A 2.7)**

II.1 **The influence of cultural norms on international equity allocation** (submitted for publication to *Journal of Banking and Finance*)

Authors: *Cristina HARIN, Alexandru TODEA*

This study extends on the cultural determinants of foreign bias, by investigating the effect of cultural tightness-looseness (CTL), capturing the external constraints on human behavior. It employs 2001–2018 data for 29 home investor countries and 37 destination countries. Accordingly, strict adherence to social norms and a low tolerance for deviant behavior can hinder the exchange of capital on foreign markets, generating sub-diversified portfolios. The economic significance of CTL is high and comparable in magnitude to geographical distance and most important cultural determinants, such as individualism, uncertainty avoidance, and power distance. Further, CTL moderates the effect of individual cultural values on foreign portfolio allocation decisions differently. The effect of individualism, masculinity, and power distance is diminished in a loose national culture with high heterogeneity of investor behavior. However, low adherence to social norms amplifies investors'

[1] See the references in the last section of each paper.

[2] All papers include an acknowledgement CNCS - UEFISCDI, PN-III-P1-1.1-TE-2019-1702.

uncertainty avoiding behavior. Overall, this study highlights the importance of CTL in international equity allocation. **(A 2.1)**

II.2 **What drives trend-following profits in stocks? The role of the trading signals' volatility** (under review at *Applied Economics*)

Authors: *Adrian ZOICAȘ-IENCIU, Maria Miruna POCHEA*

We document the influence of stock volatility on trend-following profits for a global sample of 1618 blue-chip stocks, across 43911 evaluation subperiods (2004-2018). We use the price sensitivity of trend signals (i.e., signal volatility) to isolate the detrimental impact of high stock volatility manifested through excessive/inefficient trading. The signal volatility greatly complements the stocks' mean-variance characteristics in explaining the time series variation in trend-following excess returns. The results hold for both the buy and sell excess returns, are robust across stock markets, and conserve after considering explicit and implicit trading costs. Investors can use ex post signal volatility estimates as a valid criterion to choose across potential trading rules, according to their specific levels of risk aversion and transaction costs. **(A 2.4)**

II.3 **Towards the direct measurement of risk premium implied by myopic loss aversion** (under review at *Applied Economics Letters*)

Authors: *Angela Maria FILIP, Balint Zsolt NAGY*

This paper proposes new methods to assess the myopic loss aversion premium (the expected return-differential) based on an experimental design by eliciting both willingness-to-pay and allocation percentage figures and also by inferring and comparing absolute risk aversion coefficients. Our results indicate a high level of loss-aversion and support the existence of the myopic loss aversion bias. **(A2.1)**

II.4 **Analysis of a conjecture concerning the equality of the AHP priority vector and the geometric row mean, when the former minimizes its inconsistency measure** (under review at *Nonlinear Analysis: Real World Applications*)

Authors: *Theo K. DIJKSTRA, Cristian Marius LITAN, Francisco MARHUENDA, Mircea RUS*

Positive reciprocal matrix arises in the Analytic Hierarchy Process. For this type of matrices, we characterize for which dimensions the following conjecture is true: if the principal right eigenvector minimizes the AHP error gravity function, then it equals the geometric row mean. **(A 2.2)**

III.1 **International portfolio diversification and genetic relatedness** (accepted for publication in the *Review of Economic Studies and Research Virgil Madgearu*)

Authors: *Cristina HARIN*

The purpose of this paper is to shed some light on how relatedness between counterparties can explain investment behavior, specifically how much can investor's inherited traits influence the exchange of capital. We use the genetic distance index and regress it against the foreign bias measure on pairs from 40 countries on a time period from 2001-2016. We identify that the prior exerts a significant impact on foreign investment decision, even when controlling for previous documented determinants of foreign bias. These findings reflect that international portfolio allocation is obstructed by the cultural wedge created between source and destination country, since relative difference in these characteristics disturb the flow of equity investments across markets, which ultimately hinder diversification. **(A 2.5)**

IV.1 **The nexus between hedge fund size and risk-adjusted performance** (under review at *Studia Universitatis Babes-Bolyai Oeconomica*)

Authors: *Daniela CATAN*

This paper explores the relationship between hedge fund size and risk-adjusted performance employing a data sample of 245 U.S. hedge funds classified into eight different investment strategies. The studied period spans from January 2005 to February 2021, with calculations performed both on the whole coverage period as well as three sub-periods, to isolate the pre-crisis, crisis, and post-crisis funds' behavior. Similar to previous evidence found in the literature, the results reveal an inverse relationship between hedge fund size and risk-adjusted performance (as measured by the Sharpe, Treynor and Black-Treynor ratios) in most of the cases. **(A2.4)**

IV.2 **Herding behavior under extreme market sentiments: industry-level evidence in European Emerging Markets** (under review at *Journal of Emerging Market Finance*)

Authors: *Angela Maria FILIP*, *Andreea Maria PECE*

This paper examines the effects of extreme investors' sentiments on herding behavior in five Central and Eastern European (CEE) stock markets. Our empirical research is designed to assess the asymmetric effects of two sentiment indicators, the ARMS Index and the RSI Index on herding behavior in specific industrial sectors from Poland, Hungary, Croatia, Romania, and Bulgaria. As extreme sentiments are more likely to induce herding behavior in overheated markets, we also test the impact of high optimism/pessimism on herding under excessive volatility. We report strong evidence in favor of extreme sentiment-enhanced herding. Our results are relevant both for investors, as herding behavior is likely to affect the portfolio optimization process, and for the CEE markets regulators as herd behavior is likely to prevent capital markets from achieving financial stability. **(A 2.3; A 2.6)**

V.1 **What the central banks are saying: A sentiment-index database** (working paper)

Authors: *Mihai NIȚOI, Maria Miruna POCHEA*

This study continues the work started in 2020 (see the working paper in the 2020 scientific report). So far, we have prepared the data needed to construct a monetary policy sentiment index. To achieve this objective, we extracted the NBR' reports on monetary policy between 2005-2021, we filtered the data and extracted the relevant information. The next step was to analyze the text through generating *Wordclouds* and to use financial dictionaries (such as Loughran and Mcdonald, 2011) in order to construct the sentiment indicator. In 2022, we intend to explore new methodologies of index construction based on Machine Learning, and to extend the sample for CEE countries. The final goal is to submit the paper to a Web of Science journal at the beginning of 2022. **(A 2.2)**

V.2 **Investors' sentiment and the risk-adjusted performance of US hedge funds** (working paper)

Authors: *Daniela CATAN, Angela Maria FILIP, Bogdan NEGREA*

The aim of this paper is to investigate the influence of investors' sentiment on the market timing ability of hedge funds managers. The database includes US hedge funds with a financial history of at least five years, which report incentive fees and management fees. Funds are classified in eight categories depending on the investment strategies: *Relative Value, Fundamental Long/Short Equity, Fundamental Long Only Equity, Macro Quantitative, Managed Futures Quantitative, Fund of Funds, Event Driven* and *Multi Strategy*. As explanatory variables we use Fama-French factors (Rm-Rf, SMB - Small Minus Big, HML - High Minus Low, RMW - Robust Minus Weak, CMA - Conservative Minus

Aggressive) and Fung-Hsieh factors. The final objective is to submit the paper for publication in a Web of Science indexed journal. **(A 2.4)**

V.3 **Investors' sentiment, weather conditions and stock returns** (working paper)

Authors: *Angela Maria FILIP, Andreea Maria PECE*

The objective of this study is to explore the impact of extreme weather conditions on stocks abnormal returns by the instrumentality of investors' sentiment. We applied the principal component analysis to construct sentiment indices specific to each of the 39 stock markets by using five variables *MK* (increase in market capitalization), *PSY* (psychology index), *RSI* (relative strength indicator), *VI* (volatility close to close index) and *DY* (dividend yield). To assess the impact of climatological conditions on investors' sentiment, we aggregated three meteorologic variables (temperature, atmospheric pressure and wind speed) to compose extreme weather conditions indices for each country and used these indices in asset pricing modelling. **(A 2.3; A 2.5)**

VI. **Participations in International Scientific Conferences**

VI.1 **Impact of cultural norms on foreign bias** (authors: Cristina HARIN, Alexandru TODEA), *FIBA 2021*, 27-29 May 2021, Bucharest, Romania

Participants: *Cristina HARIN*

VI.2 **Cultural norms influence on international asset allocation** (authors: Cristina HARIN, Alexandru TODEA), *ERMAS 2021*, 28-30 July 2021, Sibiu, Romania

Participants: *Cristina HARIN*

VI.3 **Extreme market sentiments and herding behavior** (authors: Angela Maria FILIP, Maria Miruna POCHEA, Andreea Maria PECE), *23rd INFER Annual Conference*, 08-10 September 2021, Lisbon, Portugal

Participants: *Angela Maria FILIP, Maria Miruna POCHEA*

VI.4 **Bank connectedness and investors' sentiment** (authors: Maria Miruna POCHEA, Mihai NIȚOI), *6th Vietnam Symposium in Banking and Finance*, 28-30 October, Vietnam

Participants: *Mihai NIȚOI*

VI.5 **Extreme market sentiments and herding behavior** (authors: Angela Maria FILIP, Maria Miruna POCHEA, Andreea Maria PECE), *8th International Conference on Opportunities and Challenges in Management, Economics, and Accounting*, 19-21 November 2021, Paris, France

Participants: *Angela Maria FILIP, Maria Miruna POCHEA*

VII. Research and documentation stages at prestigious universities abroad

VII.1 Research and documentation stage at Carlos III University, 11-17 October 2021, Madrid, Spain

Participants: *Angela Maria FILIP, Maria Miruna POCHEA*

VII.2 Research and documentation stage at Carlos III University, November 28 - December 1, 2021, Madrid, Spain

Participants: *Cristian Marius LITAN*

To conclude, the objectives and activities associated to this second stage have been 100% accomplished according to the work plan, and the scientific results are the following:

- 1 paper published online in a Web of Science indexed journal;
- 1 paper accepted for publication in international databases indexed journal;
- 4 papers under review in Web of Science indexed journal;
- 2 papers under review in international databases indexed journals;
- research and documentation stages at prestigious universities abroad;
- the update of the project's web page[3];
- the scientific and technical report.

Project leader,

Associate Professor Maria Miruna POCHEA

[3] https://econ.ubbcluj.ro/NISEM/