

Critical Conceptual Analysis on Modern Finance Theories

Cristi Spulbar

Elena Loredana Minea

University of Craiova, Faculty of Economics and Business Administration, Romania

crisi_spulbar@yahoo.com

loredanaelenaminea@gmail.com

Abstract

The main aim of this research paper is to investigate fundamental paradigms in modern financial theory. Stock markets are characterized by a complex nonlinear dynamics that does not converge towards a known finality, respectively a result that can be anticipated or influenced, or at least reduced at the level of a limit cycle. In this context, the very concept of investment rationality reaches a completely different meaning. Thus, limited rationality replaces rational expectations. Financial investors are characterized by certain features. However, inherent deviations from rational investment behavior provide an indisputable empirical evidence regarding the existence of anomalies on the capital market. The classical finance paradigm incorporates the idea that rational investors select an efficient portfolio in order to obtain the highest long-term stock returns but the risk must not exceed the tolerable limit. On the other hand, behavioral finance theory argues that the decision-making process is definitely affected by psychological, affective and emotional factors.

Key words: capital market, arbitration, investor rationality, chaos, fractal, information efficiency

J.E.L. classification: G10, G11, G15

1. Introduction

The paradigm of classical finance is based on the efficient market hypothesis. The basic principle is that each potential investor benefits from the same information so that it is impossible and unlikely to exceed the market dynamics. In other words, the definition provided by Fama revolves around the phrase that an efficient market is characterized by the fact that prices "fully reflect" all available information. Empirical evidence that settles on the basis of numerous research studies led to the substantiation of some results that suggest a rejection of the efficiency hypothesis in strong and semi-strong form. In some empirical studies, the hypothesis of weak efficiency for certain time intervals is validated. One of the most relevant criticisms of efficient market theory concerns the practical irrelevance of using this paradigm in understanding the behavior of stock markets. Numerous research studies have investigated this traditional approach, but the theory is contradicted by empirical evidence. Specifically, the efficient markets hypothesis assumes that the capital market is informational efficient. Instead, the behavioral finance paradigm that we will address in detail in this research paper emphasizes that in a specific conjuncture, financial markets are informational inefficient (Ritter, 2003).

The efficient market hypothesis includes three major dimensions, such as: weak form efficiency, semi-strong form efficiency and strong form efficiency. Houthakker and Williamson (1996) suggested that a validation of weak form efficiency generates a "random movement" or a "random walk" of stock prices. This term is specific to probability theory. Samuelson (1965) argued that stock prices are influenced by the impact of various less significant information sources.

Efficiency in semi-strong form is characterized by the fact that the prices of traded shares (financial assets) adapt to new information, available to the public very quickly and impartially, so that excess profits cannot be obtained by trading certain information. Spulbar and Birau (2018) summarized relevant issues regarding the impact of EMH and argued that the main pillar of the

efficient markets hypothesis is based on the fact that stock market security prices always include and reflect all relevant information. Moreover, Spulbar and Birau (2019) highlighted an important aspect which is that the theory of efficient stock markets includes three major dimensions, namely: the rationality of investors, uncorrelated errors and the assumption that there are no limits to arbitrage.

2. Literature review

Eugene Fama is known in the literature as the father of efficient market theory. Fama (1965) argued that: "The main conclusion will be that the data seem to show consistent and strong support for the random walk model". This implies, of course, that reading the chart has no real value to the stock market investor. The Random Walk (RWH) hypothesis or "random walk" is a paradigm that validates the principles of the efficient market hypothesis (EMH). Technically, Random Walk Hypothesis (RWH) claims that asset prices follow a random pattern. In other words, asset prices are not characterized by a predictable pattern. In addition, information efficiency plays an essential role in conceptualizing the theory of efficient markets.

On the other hand, Fama (1970) suggested that: "The defining statement that in case of an efficient market, prices fully reflect available information is so general that it has no empirical implications." Sewell (2011) conducted an extensive analysis of the existing literature on the theory of capital market efficiency (EMH) and argued that the condition to fully meet the equilibrium is a demanding requirement, suggesting that no real market could ever be efficient, inducing the idea that efficient market theory is certainly not true. Moreover, Fama (1998) revealed that "an efficient market generates categories of events that individually suggest that prices overreact to information", but the frequency is almost similar for both the undervalued reaction and the overreaction from investors.

Fama (1976) argued that "An efficient capital market is an efficient market regarding information processing, because in an efficient market, prices fully reflect available information." On the other hand, Malkiel (2003) analyzed the linkage between predictability and efficiency in the context of investment opportunity and supported the hypothesis of stock market efficiency even under the following conditions: "if many market participants are quite irrational" and "if stock prices show a higher volatility than can be explained by fundamental elements". Degutis and Novickyte (2014) examined in detail the relevant aspects of EMH and concluded that stock returns are random in case of an efficient market, but it is impossible for investors to obtain extreme (abnormal) profits in this case.

Jegadeesh and Titman (1993) offered a very attractive alternative based on momentum effect strategies that can generate abnormal returns. Spulbar et al. (2019) suggested that the short-term momentum effect is an anomaly of the efficient market hypothesis, which states that winners will outweigh short-term losses or winners will remain winners and losers will remain losers in the short term. Spulbar and Birau (2019) suggested that one of the most important assumptions of traditional finance consider that investors are rational and their main focus is to select an efficient portfolio, which represents a selection of financial asset categories. This have the main purpose to obtain the highest stock returns on long-term but on the strength of a tolerable level of risk.

3. Research methodology

In the following paragraphs we will provide a brief description of the research methods actually used in the structure of this article. Considering the fact that this article constitutes a comparative theoretical analysis, the methodological approach is limited to a critical conceptual review. However, from the econometric modeling perspective of efficient market hypothesis (EMH), we can provide the following definition based on the quantitative approach of efficient market theory:

Definition: A capital market is efficient in terms of a series of random variables, $\zeta = (G_t), t \in N$, iar $G_t \subset F_t$ and if at any time t , the market is in RE-equilibrium (Franke, Härdle and Hafner, 2011) in relation to the function that represents the price of assets traded and also for any value of i and any moment of time t , the following relation is verified:

$$G_t \subset \{F_{t,t} \cup p_t(\omega)\}$$

RE-equilibrium (rational expectations) implies the idea of an equilibrium established at time t , based on the rational expectations of investors, in which for each of its values it is aimed at optimizing the benefits obtained taking into account the information set $F_{i,t}$ and the function $p_t(\omega)$ related to asset prices.

Konstantinidis et al. (2012) have conducted a comparative research study between efficient market theory and behavioral finance paradigm and concluded that rational investment and efficient market processes over time contradict investor psychology, biased rules of behavior, and market bubbles. In addition, Beechey et al. (2000) highlighted the acute lack of understanding of the financial assets market behavior, as well as the broader objective of efficient resource allocation, while prices used in the financial market sometimes appear to be subject to substantial alignments, which can be maintained for many years. A contribution to the existing literature includes the following empirical research study, ie: Spulbar and Nițoi (2016) which argued that "higher liquidity is positively associated with efficiency, while solvency risk is negatively associated with efficiency". On the other hand, Pinto et al. (2020) suggested that in the case of an efficient market, investors expects to obtain higher average returns over the safe stocks just "by taking above-average risks".

On the other hand, Pal (2016) suggested that the adaptive market hypothesis (AMH) encompasses the efficient market hypothesis (EMH) as an idealization that is not economically feasible, but that serves as a useful benchmark for measuring relative efficiency. A stock market is efficient if prices adjust quickly and, on average, without bias to new information, because it is impossible to overrun the market, so the only concern of the investor is to select a certain risk compensation returns. However, efficiency does not require that the price of the marketable financial asset be equal to its true value, all it needs is market equilibrium. Jethwani and Kumar (2017) consider that the efficient markets hypothesis holds that stock prices already reflect all available information, so that no extraordinary profit can be obtain based on a different strategy, while relying on certain categories of information, such as: previous information, present information and inside information.

4. Results

Fractal market theory can be perceived as an interesting alternative to efficient market theory. The antagonism between this two theories is more than obvious. In fact, the fractal market hypothesis is a new and different approach, which has been developed in order to provide an alternative solution to the difficulties faced by traditional theory in explaining certain complex financial phenomena, such as the unpredictable behavior of capital markets. The fractal market hypothesis (FMH) is based on chaos theory. Chaos theory has established a new level of understanding on the concept of capital market. In general, the capital market is one of the most fertile and accessible areas to apply chaos theory given its fundamental characteristics. A chaotic system, such as the capital market, has certain characteristics such as: unpredictability, instability, nonlinear dynamics, noise and lack of control in anticipation of the dynamics of market behavior. The central element of this theory is not the efficiency of the markets, but their stability. On the other hand, liquidity plays a significant role, because if the market is liquid the market price is close to the fair price.

In classical finance theory, the entire investment construction is based on the idea of rational behavior and optimized decision making. In other words, the influence of various emotional (psychological) factors on the investment decision is completely ignored. A new paradigm has taken shape in the light of the evolutionary stages, but especially involutory and doomed to failure that have affected capital markets in recent decades, namely the behavioral finance theory. In summary, we can say that the main contribution in understanding capital markets from the perspective of behavioral finance is the use of a new independent variable on the influence of emotional and psychological factors on investment decision. This new paradigm contributes significantly to the understanding of financial market mechanisms, so that investment decisions are more effectively informed. For example, certain psychological factors such as "herd" or group instinct, poor planning, stereotyping decisions, anxiety, lack of patience, the existence of a precarious investment discipline, panic and exaltation, inertia, fear of loss, etc.

In opposition to efficient market theory, the behavioral finance paradigm argues that the influence of information asymmetry and the impact of psychological, social or demographic factors are to some extent a relevant response to obvious anomalies that characterize the behavior of capital markets. The decision-making process, based on the behavioral finance theory, can be defined as the process of selecting an investment strategy from a field of alternative strategies, as a result of a correct prior evaluation of all of them (Mathews, 2005). The behavioral finance paradigm closely combines knowledge from the psychological field and financial theory (Fromlet, 2001), being sometimes assimilated even to the psychological substratum of the decision-making process generated by the prediction of the evolution of financial markets (Talangi, 2004).

The renowned meteorologist Lorenz (1993) considers that we are surrounded by chaos and its manifestations that start from the simplest to the most complex representations. Lorenz's question remained representative in the literature: "Can the fluttering of a butterfly in Brazil cause a tornado in Texas?" In this regard, the author discussed the so-called butterfly effect, which presents the characteristic of sensitivity to the initial conditions of dynamic systems characterized by instability. This leads to the inability to provide predictive results of high long-term accuracy. The theory of fractal markets supports the hypothesis that the stock price is the result of a combination of information aimed at technical analysis (short-term) and fundamental analysis (long-term). Peters (1994) considers short-term price changes to be more volatile or "noisy" than long-term ones. Evertsz (1995) developed some empirical studies on the subject of fractal geometry of financial time series and empirically supports the hypothesis of self-similarities. In mathematics, a self-similar object is identical or nearly identical to a part of it, that is, the whole is in fact a higher-scale representation of a component part. Obviously, the property of self-similarity is a fundamental characteristic of fractals (Mandelbrot, 1982).

Despite these aspects, even if some agents acting on the financial markets are not completely rational, rational agents will prevent them from influencing the evolution of the prices of traded assets for a very long time, through a process known as arbitrage. In this regard, the main theoretical contribution of behavioral finance theory is that in an economy where rational and irrational investors interact, it is very likely that this irrational behavior will have a significant and long-term impact on financial asset prices (Barberis and Thaler, 2003). Given that risk aversion is a defining feature of capital market investors, and especially institutional ones.

The influence of informational asymmetry, the psychological, sociological and demographic substratum can represent up to a certain level, a relevant response to the anomalies reflected by the behavior of emerging capital markets. However, it should be noted that investment decisions are generally influenced by certain factors suggested by the behavioral finance paradigm. Thus, emphasis is placed on cognitive psychology and the emotional dimension of the investment process, especially in terms of short time horizons focused on speculative activity.

The behavioral finance paradigm is an alternative to the difficulties and limitations faced by the conventional financial approach. Fama (1998) argued that various stock market anomalies can be corrected with reasonable changes in technique, as these apparent anomalies are very sensitive to the methodology used to measure them. Despite the fact that behavioral finance theory offers an effective alternative to the inherent limitations of conventional finance, in some circles it is still considered a niche research area.

5. Conclusions

Compared to the theory of efficient markets that supports the practice of stationary yields, the behavioral finance paradigm is based on the use of non-stationary yields. In fact, in the case of efficient markets we are talking about a passive portfolio, while behavioral markets are based on an active portfolio. The paradigm of efficient markets differs fundamentally from the theory of behavioral finance, including the fact that in the first case the rational expectations from the economic perspective are taken into account, while in the second case the irrational expectations from the economic perspective are pursued. On the other hand, if in the case of behavioral finance the value and implicitly the maximization of personal wealth matters first, the theory of efficient markets focuses mainly on price and maximizing utility.

The efficient market hypothesis played a significant role in the development of financial theory. There is no perfect efficiency in terms of the behavior of stock markets. The practical applicability of efficient market theory (EMH) is challenged in the context of the predictable behavior of the rational investor. The three forms of efficient market theory have been rejected, in most cases, by empirical studies in the literature, especially the semi-strong form and the strong form of efficiency. In the literature, there are various research studies that test the market efficiency hypothesis, but most empirical evidence rejects this hypothesis, especially in the case of strong or semi-strong efficiency.

6. Acknowledgment

This work was supported by the grant POCU 380/6/13/123990, co-financed by the European Social Fund within the Sectorial Operational Program Human Capital 2014-2020.

7. References

- Barberis, N., Thaler, R., 2003. *A survey of behavioral finance*, *Handbook of the Economics of Finance*, Elsevier Science B.V.
- Beechey, M., Gruen, D., Vickery, J., 2000. *The Efficient Market Hypothesis: A Survey*, Research Discussion Paper – RDP 2000-01.
- Degutis, A., Novickyte, L., 2014. The Efficient Market Hypothesis: A critical review of literature and methodology, *Ekonomika*, 93(2), pp. 7-23.
- Evertsz, C. J.G., 1995. Fractal Geometry of Financial Time Series, Appeared in: *Fractals*, 3(3), 609-616, and in: *Fractal Geometry and Analysis*, The Mandelbrot Festschrift, Curacao 1995, *World Scientific* (1996).
- Fama, E. F., 1965. The Behavior of Stock-Market Prices. *Journal of Business*, 38(1), pp. 34–105.
- Fama, E. F., 1970. Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance*, 25(2), pp. 383–417.
- Fama, E.F., 1998. Market efficiency, long-term returns, and behavioral finance, *Journal of Financial Economics*, 49, pp. 283-306.
- Fama, E.F., 1976. *Foundations of Finance*. New York: Basic Books.
- Fromlet, H., 2001. Behavioral Finance – Theory and Practical Application. *Business Economics*, 36(3), pp. 63-69.
- Houthakker, H., Williamson, P., 1996. *The Economics of Financial Markets*. New-York: Oxford University Press, Inc..
- Jegadeesh, N., Titman, S., 1993. Returns to buying winners and selling losers: Implications for stock market efficiency. *Journal of Finance*, 48, pp. 65-91.
- Jethwani, K., Kumar, R., 2017. Weak Form of Efficiency of Stock Market: A Review of Literature, *KAAB International Journal of Economics, Commerce & Business Management (KIJECEBM)*, VOL-4/ISS-4/A46, pp. 345-357. Available at SSRN: <https://ssrn.com/abstract=3193827>.
- Konstantinidis, A., Katarachia, A., Borovas, G., Voutsas, M.E., 2012. From Efficient Market Hypothesis To Behavioural Finance: Can Behavioural Finance Be The New Dominant Model For Investing?, *Scientific Bulletin - Economic Sciences*, University of Pitesti, 11(2), pp. 16-26.
- Lorenz, E., 1993. *The essence of chaos*, UCL Press.
- Malkiel, B.G., 2003. *The Efficient Market Hypothesis and Its Critics*, Princeton University, CEPS Working Paper No. 91, Department of Economics, Center for Economic Policy Studies.
- Mandelbrot, B., 1982. *The fractal geometry of nature*. San Francisco: W.H.Freeman.
- Mathews, J., 2005. A Situation-Based Decision-Making Process. *Journal of Organisation Behaviour*, IV(3), pp. 19-25.
- Pal, M., 2016. *Adaptive Market Hypothesis (Study of Assumptions)*, Elsevier SSRN, Available at SSRN: <https://ssrn.com/abstract=2742496> or <http://dx.doi.org/10.2139/ssrn.2742496>.
- Pinto, P., Hawaldar, I.T, Guruprasad, K., Rohit, B., Spulbar, C., Birau, R., Stanciu, C.V., 2020. The Impact of Risk Anomalies on the Pharmaceutical Sector of the Indian Stock Market - A Comparative Analysis between Pharmaceutical, FMCG and IT companies, *Revista de Chimie Journal*, 71(2), pp. 58-63.
- Ritter, J., 2003. Behavioral Finance, Published, with minor modifications, in the *Pacific-Basin Finance Journal*, 11(4), pp. 429-437.

- Samuelson, P., 1965. Proof That Properly Anticipated Prices Fluctuate Randomly. *Industrial Management Review*, pp. 41-49.
- Spulbar, C., Birau, R., 2019. *Emerging Research on Monetary Policy, Banking, and Financial Markets*, IGI Global, USA, DOI: 10.4018/978-1-5225-9269-3.
- Spulbar, C., Ejaz, A., Birau, R., Trivedi, J., 2019. Sustainable Investing Based on Momentum Strategies in Emerging Stock Markets: A Case Study for Bombay Stock Exchange (BSE) of India, *Scientific Annals of Economics and Business*, XX (X), 1-11 (tbd), DOI: 10.2478/saeb-2019-0029.
- Spulbar, C., Birau, R., 2018. Testing weak-form efficiency and long-term causality of the R.I.P.H emerging capital markets, *International Journal of Business Quantitative Economics and Applied Management Research*, 5(2), PP. 1-19.
- Spulbar, C., Nițoi, M., 2016. The relationship between bank efficiency and risk and productivity patterns in Romanian banking system. *Romanian Journal of Economic Forecasting*, 19(1), pp. 39-53.
- Talangi, A., 2004. Modern Finance Versus Behavioral Finance. *Quarterly Journal of Financial Research*, pp. 3-25.