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Financial markets anomalies: a research review from the perspective of rational and irrational arguments

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Abstract: The purpose of this paper is to analyze, through a theoretical synthesis, the various arguments provided by the financial literature in order to comprehend the nature of the irregularities observed in financial centers that contradict the Efficient Market Hypothesis (EMH). Our findings reveal differences of opinion regarding the nature of these anomalies; however, two groups of arguments can be identified. The first group concerns the rational explanations embraced by the proponents of the efficiency hypothesis, while the second group of arguments relates to the insights of behavioral finance, which support the notion of irrational behavior in order to explain the divergence of financial market dynamics from the rationality predicted by traditional finance.

Keywords: anomalies, efficiency, rationality, irrationality, financial markets.

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1. Introduction

In the analysis of financial variables like the prices of listed assets, it is common to focus on a single factor, which is **risk aversion**. Thus, in line with the premise of perfect rationality (as proposed by Muth in 1961), investors will base their decisions on the level of risk as determined by the return's volatility, which is represented by the variance (standard deviation) of returns over a given period. According to Markowitz (1952), rational investor decisions are made by considering two essential dimensions, return expectations and variance. Return expectations pertains to the expected future returns, while variance relates to the fluctuations of these returns from the average. This appears to correspond to a perfect world where information flows freely, and access to this information is immediately granted to all economic agents. In addition, these agents possess the ability to shape their anticipations by drawing on pricing and asset valuation models like the Capital Asset Pricing Model (CAPM), which was developed following Markowitz's work by Sharpe (1964), Lintner (1965), and Mossin (1966), or by employing models that rely on discounting future cash flows resulting from the ownership of a particular asset. The idea conveyed by the rationality hypothesis is that securities at any given time possess their real values, commonly referred to as "fundamental value" or "intrinsic value." This hypothesis has a strong connection to another key assumption, namely the informational efficiency of financial markets. A market exhibits informational efficiency if all available information is immediately incorporated into the course of financial assets. Fama's findings in (1970) suggest that prices incorporate all available information, rendering it unfeasible for anyone to beat the market by achieving abnormally higher-than-average returns. Furthermore, the same author emphasizes that an observed price serves as a good estimator of intrinsic value.

At the outset, there seemed to be no reason to question the validity of these two assumptions. However, it was only in the late 1970s that a series of phenomena observed in global financial markets, especially in the American market, began to raise doubts about informational efficiency and the rational expectations hypothesis. These phenomena, related to irregularities observed in the distribution of course series (returns) of listed assets, will be labeled as anomalies. These anomalies manifest in diverse ways. Actually, the size effect, seasonal effects, excessive price (return) volatility, the momentum effect, and others are pathological phenomena that challenge the efficient market hypothesis.

Traditional finance, based on theoretical framework of the efficient information hypothesis and investor rationality, fails to provide sufficient explanations for these anomalies. When most of these anomalies elude the economist's control mechanisms, it is the psychologist or sociologist who must be consulted (Orlean 2001). Researchers from outside the finance world therefore suggest other factors that may explain the presence of these anomalies. In fact, Kahneman and Tversky (1974), a pair of psychologists, highlighted the importance of taking the psychological dimension into account within the decision-making processes of investors.

Besides factors in the field of cognitive psychology, market anomalies or "inefficiency hotbeds[1]" find other operational explanations (Gillet and Szafarz, 2004). In this case, it would be reasonable to explore the relationship between informational efficiency and operational efficiency. After all, trading conditions, market structure, quotation dynamics, and market liquidity are variables that have the potential to lead prices away from their fundamental values. In recent decades, there has been a growing tendency to delve into the study of market microstructure as a means of comprehending the dynamics of transactions and the processes involved in price formation.

The purpose of this paper is to analyze, through a theoretical synthesis, the contributions of the major research trends in financial market studies in explaining the irregularities and inefficiency pockets observed in financial markets. This work will be organized as follows: the first section will be devoted to the foundations of the Efficient Market Hypothesis. In the second section, we will demonstrate through a literature review how the identification of financial anomalies represents a violation of the assumptions of rationality and efficiency. Lastly, the third section will focus on the examination of two sets of arguments that provide adequate explanations for the irregularities observed in financial markets: arguments of irrationality according to the teachings of behavioral finance, and arguments of rationality supported, on one hand, by proponents of informational efficiency and, on the other hand, by advocates of market microstructure theory.

[1] Some anomalies only affect a specific sector or type of asset without, however, having an impact on the overall market.

2. Developing the informational efficiency hypothesis

If the informational efficiency hypothesis is closely linked to the perfect rationality hypothesis, it is primarily the result of research on the random walk model (random walk). Indeed, from the works of Jules Regnault (1834-1894) to a more scientific approach by Louis Bachelier in his theory on speculation (1900), the random walk model in finance posits that the dynamics of stock prices are governed by unpredictable random evolution. In defending his doctoral thesis, "Theory of Speculation," Louis Bachelier revisits the arguments of Jules Regnault to demonstrate, in a more scientific manner, the hypothesis of the unpredictability of stock returns. Bachelier introduced the idea that future prices cannot be predicted in any way based on the price history, as chartists[2], for example, do. It is said that the price of a stock follows a random walk if the following equation is satisfied:

$$(P_t = P_{t-1} + \varepsilon) \qquad (1)$$

The equation (1) is characterized by innovations ε with a zero expectation and finite variance, following a Laplace-Gaussian distribution.

Bachelier's contribution on the mathematical level is significant (Jovanovic, 2009), and his research continues to underpin the theoretical framework for mathematical models used in price formation and securities valuation even today. The findings attributed to Bachelier, despite their mathematical relevance, did not receive widespread dissemination in the field of finance. It was not until the mid-1960s when Samuelson (1965) first introduced these various efficient market hypotheses based on the random walk model (Sangare, 2005). Samuelson's works (1965, 1974) took an extreme stance regarding the usefulness of financial analysts and the performance of chartist strategies in the face of the power of the random walk model. In his article "Challenge to judgment" published in 1974, Samuelson sees no value in using financial analysts, as the randomness of returns constitutes the sole reality of financial markets:

> "*But a respect for evidence compels me to incline toward the hypothesis that most portfolio decision makers should go out of business - take up plumbing, teach Greek, or help produce the annual GNP by serving as corporate executives*." (Samuelson, 1974)

[2] Stock investment method based on the graphical analysis of the price and volume evolution of securities.

The initial econometric studies on the random walk model (Fama, 1965; Fama, Fisher, Jensen, and Roll, 1969) supported the unpredictability of the prices of listed securities. However, the first works that established the connection between the random walk of prices (returns) and the informational efficiency hypothesis date back to 1970 when Fama first laid the theoretical foundations of this hypothesis. The findings from Fama's (1970) study indicate that a market is informationally efficient if prices incorporate all available information, whether it is historical, public, or private. Based on the nature of the information, Fama defines three forms of informational efficiency:

Weak efficiency: a weakly efficient market implies that all historical information is reflected in security prices. This interpretation leads to the underperformance of chartist analysis that uses historical data to predict future trends. This form of efficiency is perfectly compatible with the random walk model. To test the random walk (weak efficiency), typically two types of tests are considered: either one tests the level of dependence in a series of prices (returns) through the study of serial autocorrelation, or one tests the underperformance of chartist analysis. The second test is based on another definition of weak efficiency. Certainly, Jensen (1978) argues that validating the random walk model is a necessary but insufficient condition. The researcher contends that, in addition to examining a random walk, it is necessary to test the underperformance of technical analysis. This is justified by the fact that even if the random walk is validated, a chartist strategy may not necessarily be profitable due to transaction costs. Regarding the tests that analyze dependency levels in a series of courses, they rely on estimating the parameters of the upcoming equation:

$$(R_t = a + b\,R_{T-t} + \varepsilon_1) \qquad (2)$$

The equation (2) is distinguished by R*t* as the return, with 'a' and 'b' as parameters, and R*T-t* representing the lagged return. When the parameter is significantly different from 0 for a time lag of T, the random walk hypothesis is rejected, and weak efficiency is not validated. Fama's results (1965) show that the first-order autocorrelation is significant for 11 out of 60 studied securities. However, it is assumed that this result is not significant if one intends to use it in a chartist strategy. Nonetheless, Fama argues that this conclusion lends support to the validity of the random walk model. Autocorrelation tests have been the subject of most subsequent studies.

However, during the 1980s, some criticisms directed research toward other tests. These criticisms mainly relate to the lack of robustness of classical autocorrelation tests within the framework of linear ARMA[3]-type models. One of the tests considered robust against non-normality and heteroscedasticity issues was first introduced by Lo and Mackinlay (1988; 1989). The two researchers developed the variance ratio test, demonstrating its effectiveness compared to other known tests at that time. The concept behind this test states that when a variable follows a random walk, its difference in variance should be a linear function of the period chosen for the test. This method was subsequently developed by Chow and Denning (1993), Wright (2000), and Kim (2006).

Semi-strong efficiency: Semi-strong efficiency is verified when prices adjust to the arrival of public information regarding a company's fundamentals and the economic conjuncture. The testing of this form of efficiency is based on event studies[4]. Actually, announcements of capital increases, dividends, earnings, or even information about macroeconomic variables like Gross Domestic Product (GDP) do not provide a particular advantage, as prices automatically adjust to the arrival of this information. To test semi-strong efficiency, it is necessary to verify whether the residual return in the model (3) is statistically zero. The residual return (or abnormal return) is determined as follows:

$$\varepsilon_{it} = R_{it} - E\,(R_{it}/R_{mt;}\ \beta_{it}) \qquad (3)$$

With:

R_{it} is the return of security i at date t, $E\,(R_{it}/R_{mt;}\ \beta_{it})$ measures the normal return as assessed by the Capital Asset Pricing Model (CAPM), where β_{it} is the sensitivity coefficient of the security to market movements, and R_{mt} indicates the market return at the same date t, measuring systemic risk. Fama, Fisher, Jensen, and Roll (1969) tested the impact of distributing free shares on the price levels of 622 stocks listed on the American market. The authors demonstrated that the average of the residuals (abnormal returns in equation 3) does not deviate from 0 as a whole, confirming semi-strong efficiency.

[3] Modeling method proposed by Box and Jenkins (1976), a modeling approach that employs the ARMA model with an autoregressive part noted as AR and a moving average part noted as MA.

[4] The study of events is now the new designation for the semi-strong form, following Fama's work in 1991.

Strong efficiency: Strong informational efficiency assumes that abnormal profits cannot be achieved by holding private information. To test this form, the conducted studies have attempted to analyze two types of information: information held by financial analysts and that held by insiders, typically managers or shareholders. One of the earliest studies on insider information is that of Jaff (1974) when he demonstrated that insiders can exploit their information 8 months before it becomes public. This result was later criticized by authors like Seyhun (1986), who argued that it is more a critique of the Capital Asset Pricing Model (CAPM) than of strong efficiency.

So far, it seems that in an efficient market, the random nature of the stock price (returns) evolution implies that they have no memory, such that neither technical analysis based on past data nor fundamental analysis[5] provides abnormally higher gains than the market average. Fama's theoretical formulation in his 1970 work demonstrates that stock price movements are unpredictable, causing security prices to converge towards an equilibrium price obtained through a valuation model in a world of free competition. Such competition in the presence of a large number of agents whose goal is always profit will result in the maintenance of market equilibrium (Mignon, 2008). Implicitly, the informational efficiency hypothesis accepts the idea that agents are rational and act with full knowledge of the transactional environment in which they operate.

The idea, as outlined by Walter in (1996), is that efficiency implies prices faithfully representing economic reality, aiding in rational decision-making. The informational efficiency hypothesis is fundamentally based on the rationality of investors. Muth's (1961) perfect rationality hypothesis assumes that well-informed investors are capable of accurately anticipating the prices of listed assets. This theory states that rational agents are able to bring prices back to their fundamental values through arbitrage mechanisms when the involvement of agents with limited (or irrational) rationality does not affect price movements in either an upward or downward direction. This is explained by the low influence of the latter type of participant, but mainly because their actions are not correlated and offset each other, thus maintaining market equilibrium.

[5] Analysis based on the study of publicly available information derived from the financial disclosures of companies, such as financial statements, for example.

According to Orlean (2008), an efficient market is one that can continuously produce the true value of securities, which implies the ability to estimate the intrinsic value of securities at any given moment. In line with classical financial theory, the fair value is equivalent to the present value of future cash flows associated with the ownership of a financial asset. A financial asset is defined as a security (or contract) that entitles the holder to income or capital gains, and these cash flows serve as the fundamental element for assessing the value of the asset using a dynamic approach. For stocks, these income streams correspond to the anticipated future dividends extending to infinity. The fundamental value of a stock is nothing more than the sum of the future dividends discounted by the model known as the Dividend Discount Model (DDM). Therefore, the price of a stock in an efficient market corresponds to the present value of future dividends, so that fluctuations in real prices reflect fluctuations in dividends and/or the interest rate (discount rate).

The success of the informational efficiency hypothesis and that of investor rationality imply that real prices do not deviate from the fundamentals, particularly dividends. Furthermore, dividends are based on profits earned. These profits, being contingent on actual performance, should not diverge from the economic fundamentals of the company and the overall economy of the country. The prices of financial assets are supposed to reflect fluctuations in the real economy, and this assumption forms the basic foundation of modern financial theory. Now, how do certain phenomena observed in global financial markets constitute violations of the assumptions of rationality and efficiency?

3. Financial anomalies and violations of the efficiency and rationality assumptions

As we mentioned at the beginning, initially, nothing seemed to challenge the assumptions of rationality and efficiency. However, a series of detected financial anomalies has long been a violation of these two hypotheses. These are irregularities of various kinds that contradict the fundamentalist rationality of classical finance. These anomalies pertain to the irregularity of observed real price distributions (returns). Among the most well-documented anomalies, we can mention calendar effects, such as the January effect (Rozef and Kinney, 1976), which refer to periods within the year, month, or week characterized by abnormally high (low) returns. Another phenomenon that has been observed relates to the size effect, as Banz (1981) illustrates that smaller companies, in terms of market capitalization, achieve higher returns than their larger counterparts.

In a related context, DeBondet and Tahler (1985) successfully brought attention to a long-term anomaly. They observed that, after arranging stocks listed on the New York Stock Exchange (NYSE) in descending order of returns, portfolios labeled as winners based on past performance tended to reverse their fortune and become losers, and vice versa. In the short term, Jegadeesh and Titman (1993) illustrated that stocks with positive (negative) returns over an intermediate time frame (3 to 12 months) sustained their performance trend, unveiling the well-known "momentum effect" anomaly. Another anomaly among the most studied concerns the abnormally volatile nature of stock prices. As a matter of fact, Shiller (1981) and LeRoy and Porter (1981) demonstrate that prices are too volatile compared to the rational prices anticipated ex-post by the discounted dividend model. Excessive volatility constitutes a violation of the rational expectations model, which rejects the idea that there is a connection between the economic sphere and the financial sphere.

In this context, analyzing the history of financial crises from the Great Depression of 1929 to the 2007 subprime crisis[6], including the 1987 crash and the 2001 internet bubble, reveals that excessive volatility appears to be the phenomenon that has garnered the most attention within the scientific community of market finance researchers. Indeed, when asset prices are supposed to reflect firm performance and the evolution of macroeconomic variables, the violation of the discounted dividend model supports the concept of a complete disconnect between the real economy and the financial economy. Thus, a financial bubble occurs when prices or price indices persistently deviate from the fundamentals. Tests of excessive volatility are of particular interest because a test of excessive volatility is considered an efficiency test (Campbell and Shiller, 1987; Fontaine, 1990; Cuthberston and Hyde, 2002; Beneburg, 2006). Although this reasoning is not thoroughly demonstrated, the deviations of real prices from rationally anticipated prices constitute an element in favor of a deviation of the reality of financial markets from the fundamentalist rationality of classical finance. In this analytical framework, it appears that most anomalies, especially excessive volatility, do not find sufficient explanations in modern financial theory. Now, in light of this reality, what are the reasons that may explain the observed irregularities, particularly the dramatic nature of stock market index volatility in most global financial markets? In other words, what arguments are put forth by theorists and practitioners to explain these anomalies and discrepancies between prices and fundamentals?

[6] Mortgage credit crisis triggered in the United States in 2007.

4. Financial anomalies: a view from fundamentalist rationality and irrational behavior

In this section, prior to delving into irrational explanations of financial anomalies, we will initially scrutinize the viewpoints presented by advocates of informational efficiency as well as those offered by market microstructure theory.

4.1 Rational explanations for financial anomalies

In accordance with the theoretical foundations of classical finance, it is challenging to grasp the concept of anomaly, whether it concerns short-term phenomena like the momentum effect, seasonal anomalies, longer-term phenomena, or even excessive volatility phenomena. However, proponents of rationality and efficiency assumptions use arguments that explain these irregularities without contradicting these assumptions. In this regard, the January effect, for instance (particularly its relation to the size effect), is primarily based on the tax hypothesis. Truthfully, to benefit from the tax-deductibility of undervalued assets, investors attempt to divest themselves of securities that have incurred losses in order to obtain tax reductions (Dyl, 1977). Thus, the existence of a positive relationship between this anomaly and that of size can be explained by the risk profile of these firms (Rogalski and Tinic, 1986). In fact, within an expected return expectations/variance framework, the higher the risk, the higher the expected return as well (Markowitz, 1952).

Regarding other anomalies, especially when it comes to excessive volatility, existing literature suggests that the theory of rational bubbles[7] provides significant insights into understanding the mechanisms of bubble formation and critical levels of volatility (Gillet and Szafar, 2004). Nevertheless, even though it makes a substantial contribution, the theory of rational bubbles keeps the discussion receptive to alternative interpretations.

[7] A rational bubble is a speculative bubble that forms within a rational framework, meaning that the bubble neither contradicts the assumption of rationality nor that of informational efficiency. However, irrational deviations refer to an amplification of the bubble that is primarily linked to the presence of irrational agents or noise traders. Rational bubbles support the idea of bubble existence without seeking to provide sufficient explanations, whereas the presence of irrational bubbles is attributed, according to proponents of behavioral finance, to psychological factors that limit rationality in decision-making. (See, for example: Diba B.T. and Grossman H.I. (1988), "The theory of rational bubbles in stock prices," Economic Journal, 98, September, pp. 746-754; Blanchard O.J. and Watson M.W. (1984), "Bubbles, rational expectations, and financial markets," Annales de L'INSEE, 54, April-June, pp. 88-99.)

In addition to these arguments that involve a certain rationality, other arguments supported by proponents of the efficiency theory state that market anomalies are linked to the methodology used in empirical tests and further contend that efficiency is not directly testable without going through an equilibrium model. Following this logic, market anomalies are linked to deficiencies in pricing models. In this regard, Fama and French (1993) formulated a three-factor model in reaction to the limitations of the Capital Asset Pricing Model (CAPM) to illustrate that specific anomalies are, in fact, associated with the CAPM rather than informational efficiency. The three-factor model helps explain anomalies such as the size effect and anomalies of stocks with higher book values compared to market values. Advocates of informational efficiency argue against using transient phenomena, such as anomalies, as grounds for rejecting the Efficient Market Hypothesis (EMH). Their argument is based on the lack of persistence of these phenomena over time, and especially the absence of a consensus regarding the authors' conclusions, which is likely linked to the lack of robustness in the tests used to detect these anomalies.

Given the inability of classical models to provide adequate explanations for market anomalies and financial market volatility, a theory that has been developed since the late 1960s, which focuses on studying the details of the exchange process, offers alternative explanations for the irregular nature of price and return dynamics. This is the market microstructure theory, which addresses the operational aspects of markets and seeks to analyze the price determination process. In the insights provided by Schwartz (1988), microstructure theory consists of: "analyzing the details of the exchange process: the key elements of this process include the production and dissemination of information, the arrival of orders, as well as the rules, institutions, and other market characteristics that determine how orders are transformed into trades" (Schwartz, 1988).

Microstructure is, therefore, a research field that bridges the gap between market organization and quality. In this context, observed anomalies sometimes find explanations in market organization, although the latter encompasses a wide range of elements (Majois, 2008). Regarding volatility, the use of microstructure links excessive volatility to the imbalance between liquidity supply and demand. Under the same circumstances, microstructure also connects the quality of information disseminated by the market with its level of transparency. Thus, a market lacking sufficient transparency is a volatile and inefficient market (Madhavan, 1995).

The observed anomalies in financial markets often find explanations related to organizational factors of the markets, which require a thorough study of the functioning modes and organizational modes of the markets. Therefore, the analysis of microstructure allows for the interpretation of anomalies and critical levels of volatility without questioning the rationality of investors (Revest, 2001).

4.2 Irrational explanations for financial anomalies

So far, it appears that all the explanations provided above do not challenge the assumption of rationality. In fact, advocates of the Efficient Market Hypothesis (EMH) attempt to find rational explanations for anomalies, and the primary objective of market microstructure and its various components is to provide sufficient interpretations for anomalies without contradicting the rationality of participants. Now, when certain anomalies elude the control mechanisms of economists in accordance with classical financial theory, how can we interpret the impact of such phenomena on financial markets?

To address this question, researchers from outside the finance world have proposed alternative models to explain individuals' behavior when it comes to making decisions in an uncertain future. As a matter of fact, Kahneman and Tversky (1974), two psychologists, demonstrated the importance of considering heuristics[8] in the decision-making process of investors. These heuristics are responsible for behavioral biases that contradict the rationality predicted by classical finance and often explain the irregularities observed in financial markets as a consequence of participants' irrationality. This observation demonstrates why some researchers take into consideration other dimensions, such as psychology, to explain the presence of these anomalies. The application of psychology to finance, or "Behavioral Finance," owes its existence as an emerging theory to these researchers. Incorporating the psychological dimension to comprehend the price formation process emerges as an alternative mindset to classical financial theory. Behavioral finance is rooted in two complementary approaches:

- ✓ **The prospect theory** (Kahneman and Tversky, 1979) introduces a new function for value and individual preferences, in contrast to what classical financial theory predicts.

[8] When faced with complex choices, individuals are governed by simplified rules that psychologists like Kahneman and Tversky attempt to illuminate.

- ✓ **Furthermore**, **the existence of irrational investors** (De Long, Shleifer, Summers, and Waldman, 1990), or the noise trader approach, suggests the presence of uninformed investors who develop their expectations in an irrational manner.

By drawing from the insights of behavioral finance, various interpretations make it possible to explain deviations from rationality in certain phenomena observed in financial markets. Supporters of behavioral finance attribute this irrationality to a range of behaviors outlined in financial literature focused on investigating the psychological and emotional factors influencing investment decisions in the stock market (Edwards, 1968; Greither, 1980; Tahler, 1985; Svensen, 1981; Orléan, 1990; Shiller, 1989, 2000). Among these behavioral biases, the most documented ones include "conservatism," "representativeness bias," "availability bias," "under and/or overreaction" to the arrival of information, "overconfidence," "herd behavior," and "mental accounting."

When it comes to phenomena of excessive volatility, research in financial markets demonstrates that we cannot explain the dramatic market fluctuations solely by referencing fundamentalist rationality. Indeed, scholars such as Shiller (1981, 1989, 2000), Odean (1999), Orléan (2001), and Chuang and Lee (2006) advocate the notion that it is not possible to fully explain the abnormal level of volatility solely by considering movements in the fundamentals of the economy and firms. This implies taking into consideration psychological factors in line with behavioral financial theory. In fact, the history of financial crises since the Tulipomania[9] clearly demonstrates that speculative bubbles exhibit a consistent behavior that repeats with each financial bubble expansion. Certainly, when prices rise, the phenomenon continues persistently, sometimes reaching critical levels, and it concludes dramatically with a price collapse, thus triggering the onset of an extended crisis phase. As per André Orléan (2009), financial markets do not adhere to the principles of supply and demand, unlike regular goods and services markets. This is because investors are not motivated by the intrinsic value when purchasing securities. Instead, they primarily seek returns, causing these securities to remain in high demand even when their prices are inflated. Investors often believe they can sell them at an even higher price, disregarding the potential for a sudden collapse.

[9] Tulipomania, or the Tulip Crisis, is regarded as the first financial crisis that occurred in the northern provinces of the United Netherlands (present-day Netherlands) in 1637.

In his book published in 2009, " *De l'euphorie à la panique: penser la crise financière,*" Orléan effectively illustrates this mechanism by stating: "The rise in prices, by virtue of its ability to generate high returns, enhances the appeal of the asset and strengthens demand, which, in turn, exerts upward pressure on prices. This is how a self-sustaining cycle of price increase is formed" (Orléan, 2009). Within the scope of this analytical setting, we argue that stock market investors are developing a new concept of value, unlike the classical notion of objective value. Investors are no longer concerned with fundamentals but rather with the collective market opinion. This refers to mimetic behavior as an essential factor for understanding the mechanism of observed anomalies, bubbles, and critical levels of volatility. Now, what is the connection between this mechanism and mimetic behavior?

The answer is evident when it comes to incorporating the influence of collective opinion as a crucial element that sustains and perpetuates such speculative behavior. Mimicry corresponds to situations in which individuals abandon their own beliefs in favor of the market's opinion. It is a tracking behavior when investors decide to imitate the actions of other investors. In this regard, mimicry is considered one of the key factors responsible for the increase in levels of volatility. In the same context, Shiller (2000) believes that mimetic behavior amplifies the *irrational exuberance*[10] of markets, which sustains the upward trend of prices in speculative markets.

If mimicry is responsible, as factors within the realm of cognitive psychology, for certain anomalies, particularly excessive volatility, the financial literature has long studied this concept even before the emergence of behavioral finance. Furthermore, globally renowned researchers believe that the act of imitation, even though it leads to irrational outcomes regarding high price volatility, does not warrant the rejection of agent rationality. In point of fact, Shiller (1984) posits that mimicry is a common human behavior, even among rational agents. More recently, economist Orléan (2009) has championed the same idea. Both authors believe that imitating the actions of others is justified if one believes that these others are better informed, and their actions are worth emulating to reduce the risk associated with market fluctuations.

[10] "Irrational exuberance" is an expression coined by former Fed Chairman Alan Greenspan and borrowed by the American economist R. Shiller in his works on irrational exuberance (2000, 2005, and 2014). This expression was initially used to caution against a potential overvaluation of the stock market, and later became commonplace following Shiller's research to describe a situation of a boom or even a financial crisis.

Tracking the collective market trend may at times exhibit a certain strategic rationality among investors, but it should be distinguished from the fundamentalist rationality of traditional finance. Despite differing opinions regarding the nature of mimicry—whether it is irrational or rational—what is evident is that the history of financial crises highlights that mimicry lies at the core of financial bubbles. While the debate surrounding the nature of investors' mimetic behavior (whether it's rational or irrational) remains ongoing, another well-documented behavior in cognitive psychology (Haoudi and Rajouani, 2011) is related to investors' high levels of confidence. Excessive confidence of agents is defined as an overestimation by an individual of their own beliefs about the value of a security. Shiller (2000) demonstrates through survey results that investors believe they can always choose the right securities and mutual funds. This excess of confidence, according to researchers like Odean (1998) and later Gervais and Odean (2001), is responsible for the excess price volatility.

Chuang and Lee (2006) demonstrate that overconfident investors tend to underestimate the risk associated with holding a risky asset. This risk neglect is likely to encourage the acquisition of assets that are too risky, thereby amplifying observed levels of volatility. Anomalies such as excessive volatility, the momentum effect, the reversal effect (long-term trend reversal, as proposed by DeBondet and Tahler in 1985), and high trading volumes have been the subject of extensive research within the field of investor psychology. In fact, Odean (1998) and Gervais and Odean (2001) have conducted studies based on an overconfidence model, revealing a positive relationship between excess trading volumes and excessive volatility. The substantial trading activity, as proposed by Daniel et al. (1998), is linked to self-attribution bias, wherein overconfident agents place faith in information that aligns with their own opinions, motivating them to boost their trading transactions.

Behavioral finance research reveals that investor irrationality must consider overconfidence to explain certain anomalies. In this context, an extensive empirical literature is built around the tests and models developed to better understand the various relationships between overconfidence and market anomalies. These studies, using recent developments in econometric tools as their methodological framework, also rely on an experimental framework that aims to replicate the same conditions of a speculative market to study the dynamics of financial variables and detect certain behavioral biases. Furthermore, the literature also highlights the importance of qualitative studies to understand the market psychology, as demonstrated by Shiller's 1989 survey of market participants.

5. Conclusion

The purpose of this paper was to identify the contributions of various schools of thought in market finance to the explanation of financial anomalies. Our findings indicate that the financial literature built around this question primarily focuses on two types of arguments to interpret market irregularities that contradict mainstream financial theories. The initial set of arguments relates to the rational explanations embraced by advocates of rationality and information efficiency assumptions. They propose that anomalies are largely viewed as transitory phenomena associated with a range of factors. Within these factors, market microstructure suggests that information inefficiency in the market is often linked to organizational and operational efficiency while preserving the validity of the assumption of investor rationality. The second set of arguments, commonly known as "arguments of irrationality," considers that experiments carried out within the realm of cognitive psychology play a crucial role in understanding the observed irregularities. Indeed, before delving into the fundamentals of firms, one must explore market psychology to comprehend the movements of speculative crowds. Such reasoning explains why behaviors such as "overconfidence" and "mimetic behavior" are among the most studied by behavioral finance to understand anomalies, particularly the mechanisms of amplifying financial bubbles.

References

[1] Bachelier L (1900). « Théorie de la spéculation », *Annales de l'École Normale Supérieure*, 3esérie, 17, 21-86 (réédition : 1995, Paris, J. Gabay).

[2] Balint C and Gica O (2012), "Is the January effect present on the Romanian capital market?" Procedia - Social and Behavioral Sciences 58, p.523 – 532.

[3] Banz R. (1981). "The Relationship between Return and Market Value of Common Stocks", Journal of Financial Economics, vol. 9, n°1, p.3-18.

[4] Beneburg (2006). "Excess Volatility in European Equity Style Indices – New Evidence"

[5] Campbell J.Y et Shiller R. (1987). « Cointegration and tests for present value models », Journal of Political Economy, vol. 95, n° 5, p. 1062-1088.

[6] Chiny F & Mir A. (2015). "Tests del'efficience du marché financier marocain",Global Journal of Management and Business Research: C Finance, p.1-17.

[7] Chow K.V & Denning K.C (1993). « A Simple Multiple Variance Ratio Test », Journal of Econometrics, 58, p.385–401.

[8] Chuang W.I et Lee BS (2006). "An empirical evaluation of the overconfidence hypothesis" Journal of Banking & Finance, 30 (2006), p. 2489-2515.

[9] Cornioley C Pasquier-Dorthe J (1991). « Effets de janvier et de taille sur le marché des actions suisses », Revue économique et sociale : bulletin de la Société d'Etudes Economiques et Sociales, p.193-211.

[10] Cuthberston et Hyde (2002). "Excess volatility and efficiency in French and German stock markets", Economic Modelling, 19, p.399-418.

[11] De Bondt W.F.M & Thaler R (1985). "Does the Stock Overreact?", Journal of Finance, 42, 3, 793-808.

[12] De Long J, Shleifer A, Summers L and Waldman J (1990). "Noise Trader Risk in Financial Markets", Journal of Political Economy, 98, 703-738.

[13] Dyl E.A et Maberly E.D (1986), "The weekly pattern in stock index futures:A futher note", Journal of Finance,41,1149-1152.

[14] Dyl E.A et Maberly E.D (1986), "The weekly pattern in stock index futures:Afuther note", Journal of Finance,41, p.1149-1152.
[15] Edwards W (1968) . "Conservatism in human information processing, in B. Kleinmutz", ed., *Formal Representation of Human Judgement*, Wiley, NY.
[16] El Khattab Y&Moudine.C. (2014), « Essai sur L'efficience informationnelle du marché boursier marocain », Global Journal of Management and Business Research, Finance, Volume 14.19-30.
[17] Fama E (1965). "The Behavior of Stock Market Prices", The Journal of Business, 38,34-105.
[18] Fama E (1970). "Efficient Capital Markets: a Review of Theory and Empirical Work", Journal of Finance, vol. 25, no1.383-417.
[19] Fama E, Fisher L, Jensen M.C, and Roll R (1969). "The Adjustment of Stock Prices to New Information." International Economic Review 10, p.1-21.
[20] Fontaine P. (1990). " Peut-on prédire l'évolution des marchés d'actions à partir des cours et des dividendes passés? (Tests de marche au hasard et de coïntégration)", Journal de la Société de Statistique de Paris, Tome n° 19, p.17-39.
[21] Gervais S, Odean T (2001). "Learning to be overconfident"Review of Financial Studies, 14, p. 1-27
[22] Gillet R et Szafarz A (2004).« Marchés financiers et anticipations rationnelles », Reflets et perspectives de la vie économique 2004/2 (Tome XLIII), p. 7-17.
[23] Grether D et Bayes M (1980). « Rule as a descriptive model : The representativeness heuristic ».*Quarterly Journal of Economics*, vol. 95,1980, p. 537-557.
[24] Haoudi A et Rajouani B (2011). « Le comportement des analystes financiers et des investisseurs à la lumière des apports de la finance comportementale », Revue Marocaine de Gestion et d'Economie, N°5, Juillet- Décembre 2011.
[25] Jaffe J.F (1974). « Special information and insider trading », Journal of Business, vol. 47, p. 410-428.
[26] Jegadeesh N and Titman S (1993). "Returns to buying winners and selling losers: Implications for Stock market efficiency", Journal of Finance, 48. 65-91.
[27] Jegadeesh N and Titman S (1993). "Returns to buying winners and selling losers: Implications for Stock market efficiency", Journal of Finance, 48, p.65-91.
[28] Jensen M.C (1978). « Some Anomalous Evidence : Regarding Market Efficiency », Journal of Financial Economics, Vol. 6, Nos. 2/3, p.95-101.
[29] Jovanic F (2009), « *Bachelier a-t-il vraiment été le précurseur oublié que l'on dépeint ? Analyse de la diffusion du travail de Louis Bachelier entre 1900 et 2005* (document de travail).
[30] Kahneman D, Tversky A (1974). "Judgement under uncertainty: heuristics and biases", Management Science 185, 1124–1131.
[31] Kim J.H (2006). "Wild bootstrapping variance ratio tests", Economics Letters, 92, p. 38-43.
[32] LEROY S. F. et PORTER R. D. (1981). « The Present-Value Relation : Tests Based on Implied Variance-Bounds », Econometrica, 49, p.555-574.
[33] Lilti J.J (1994). « Les apports de la cointégration aux tests d'efficience », Journal de la Société Statistique de Paris, Tome 135, n° 4, p. 47-63.
[34] Lo A.W and MacKinlay A.C (1988). "Stock market prices do not follow random walk: Evidence from a simple specification test". The Review of Financial Studies, 1, p.41-66.
[35] Lo A.W and MacKinlay A.C (1989), "The size and power of the variance ratio test in finite samples: A Monte Carlo investigation", Journal of Econometrics, 40, p.203-238.

[36] Madhavan A (1995). « Consolidation, Fragmentation, and the Disclosure of Trading Information »,Review of Financial Studies, 1995, vol. 8, issue 3, p.579-603
[37] Majois C (2008), « Transparence et microstructure des marchés : une revue de littérature », Finance 2008/2 (Vol. 29), p. 5-56.
[38] Markowitz H.M (1952). "Portfolio Selection", Journal of Finance, 7, 77-91.
[39] Mignon V (2008), « Les ambiguïtés de la théorie de l'efficience informationnelle des marchés financiers », Regards croisés sur l'économie 2008/1 (n° 3), p. 104-117.
[40] Mossin J (1966). "Equilibrium in a Capital Asset Market." Econometrica. October, 35, p. 768–83.
[41] Muth J.F (1961). "Rational Expectations and the Theory of Price Movements", Econometrica, Vol. 29, No. 3, 315-335.
[42] Odean T (1999). « DO Inverstors Trade Too Muvch ? », American Economic Review. 89, NO.5 , p.1279-1298.
[43] Orléan A (1990). « Le rôle des influences interpersonnelles dans la détermination des cours boursiers », Revue économique, volume 41, n°5, 1990, p. 839-868;
[44] Orléan A (2001). « Comprendre les foules spéculatives : mimétisme informationnel, autoréférentiel et normatif », Ouvrage collectif, « les crises financières », édité par Jacques Gravereau et Jacques Trauman, aux éditions Economica, chapitre 4, p.105-128.
[45] Orléans A (2009). De l'euphorie à la panique, édition Rue d'ULM.
[46] Regnault J (1863). « *Calcul des chances et philosophie de la bourse* », Paris, Mallet-Bachelier etCastel.
[47] Revest V(2001). « Une réflexion sur la place des institutions au sein des théories de la microstructure », Revue d'économie industrielle, vol. 96, 3e trimestre, p.105-123.
[48] Rogalski R.J and Tinic. S.M (1986). "The January effect Size Effect: Anomaly or Risk Mismeasurement?" Financial Analysts Journal, Vol 42,N°6, p.63-70.
[49] Rozeff M.S et Kenney W.R (1976). "Capital market seasonality: The case of stock returns", Journal of financial Economics, 3, p.379-402.
[50] Samuelson P.A (1965). « Proof that Properly Anticipated Prices Fluctuate Randomly », *Industrial Management Review*, p. 6, 2, 41-49.
[51] Samuelson P.A (1974). « Challenge to judgment », Journal of Portfolio Management, 1 :17—19, Fall 1974.
[52] Sangare A (2005). « un siècle après Bachelier », revue économique financière, V 81 N 4, p.107-132.
[53] Schwartz R.A (1988). « Equity markets : structure, trading and performance », Harper and Row.
[54] Seyhun H.N (1986). « Insiders' profits, costs of trading, and market efficiency », Journal of Financial Economics, Volume 16, Issue 2, p.189-212.
[55] Shiller R.J (1981). "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?", The American Economic Review, VOL. 71, N° 3, p.421-436.
[56] Shiller R.J (1989). « The market volatility », MIT Press, Cambridge.
[57] Shiller R.J (2000). Irrational Exuberance , Princeton University Press, 41 William Street, Princeton, New Jersey 08540.
[58] Svenson O (1981). "Are we all less risky and more skilful than our fellow drivers ?", *Acta Psychologica*, 47, p. 2071-2153.
[59] Walter C (1996), « Une histoire du concept d'efficience sur les marchés financiers », Annales. Histoire, Sciences Sociales, Volume 51, Numéro 4, p. 873-905
[60] Wright, J.H., 2000, Alternative variance-ratio tests using ranks and signs. Journal of Business & Economic Statistics 18, p.1-9