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Rational Expectations vs. Behavioral Biases: An Empirical Analysis of Trading Variability in International Capital Markets

Frank Westermann[a]
Daniel Schunk[b]

Abstract
This paper presents a pioneering investigation into the impact of rational expectations and behavioral biases, such as animal spirits, on the variability of trading in international capital markets across five developed countries. By analyzing daily data, we aim to shed light on whether rationality or behavioral factors play a predominant role in shaping trading dynamics. Our empirical findings challenge the hypothesis of rationality, as we observe that rational expectations alone do not significantly account for the evolution of trading patterns. Instead, our results indicate that the economy is predominantly influenced by behavioral biases, with animal spirits emerging as a particularly noteworthy factor driving trading variability. This study contributes novel insights by providing empirical evidence of the prevalence of behavioral biases in shaping trading behavior across international capital markets. By highlighting the significance of animal spirits, we underscore the importance of considering psychological factors alongside rational expectations in understanding market dynamics. Our findings suggest that behavioral biases play a crucial role in driving trading variability, emphasizing the need for policymakers and market participants to account for these psychological factors in their decision-making processes. This research opens avenues for further exploration into the interplay between rationality and behavioral biases in financial markets.
Keywords: Rational Expectations, Behavioral Biases, Animal Spirits, Trading Variability
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1. INTRODUCTION

The past five decades have witnessed a shift in the understanding of how economies and financial markets operate. Traditional theories such as the efficient market hypothesis and the assumption of rationality have faced challenges in explaining the observed phenomena of excessive volatility in stock returns and trading volumes across global markets. In response, scholars have introduced additional factors beyond rational expectations to account for the behavior of these market components. Authors have proposed various variables to supplement rational expectations theory in explaining market dynamics. One such factor is overconfidence, as discussed by Daniel et al., (1998), which suggests that investors may exhibit unwarranted confidence in their abilities to predict market movements, leading to irrational trading behavior. Optimism and pessimism, as explored by Haruvy et al., (1999), Weinstein (1989), Otten (1989), De Bondt and Thaler (1987), and Barberis et al., (1998), also play significant roles in influencing investor decisions and market outcomes. Moreover, the concept of animal spirits, as articulated by Akerlof and Shiller (2009), offers a broader perspective on market behavior, emphasizing the role of psychological factors and herd mentality in driving market fluctuations. These behavioral biases and sentiments contribute to the observed disruptions in both trading volumes and stock returns, challenging traditional economic theories that rely solely on rationality and efficiency assumptions. The inclusion of psychological and behavioral factors alongside rational expectations provides a more comprehensive framework for understanding the complexities of financial markets and their inherent dynamics. By acknowledging the influence of human emotions and cognitive biases, researchers can better explain the observed phenomena of volatility and trading activity in both developed and emerging markets.

While Akerlof and Shiller (2009) significantly expanded upon Keynes (1936) concept of animal spirits in his General Theory, their definition remains subject to debate. In their work, they introduced several components to the concept, including confidence, fairness, corruption and association behavior, money illusion, and stories. These additional elements enrich the understanding of animal spirits beyond Keynes (1936) original conception, offering insights into the psychological and behavioral aspects of economic decision-making. However, despite the contributions made by Akerlof and Shiller (2009) the definition of animal spirits remains contentious among scholars and practitioners. Some may argue that the inclusion of diverse components broadens the scope of animal spirits to encompass a wide range of human behaviors and sentiments relevant to economic activities. Others may critique the concept for its subjective nature and the challenge of quantifying or measuring these psychological factors accurately. Nevertheless, the recognition of animal spirits as an influential force in shaping economic outcomes has gained traction in academic and policy circles. By acknowledging the role of human emotions, biases, and social interactions in economic decision-making, researchers can better understand the dynamics of markets and anticipate their implications for policy and

[a] European School of Management and Technology (ESMT), Berlin, Germany
[b] European School of Management and Technology (ESMT), Berlin, Germany

regulation. Despite ongoing debates, the concept of animal spirits continues to serve as a valuable lens through which to analyze and interpret economic phenomena in a holistic manner.

Keynes's (1936) definition of animal spirits, as cited on pages 161-162 of his seminal work "General Theory," offers a more restrictive perspective compared to the broader interpretation proposed by Akerlof and Shiller (2009). In Keynes (1936) view, animal spirits are characterized as "a spontaneous urge to action rather than inaction." This definition emphasizes the impulsive and dynamic nature of human behavior, suggesting that economic decisions are often driven by innate instincts and impulses to engage in action rather than passive behavior. Unlike Akerlof and Shiller (2009) expansive definition, which incorporates various psychological and behavioral components such as confidence, fairness, and storytelling, Keynes (1936) definition focuses primarily on the underlying urge or inclination toward action. By emphasizing the spontaneous and instinctual aspect of human behavior, Keynes (1936) highlights the role of psychological factors in influencing economic activities, particularly in times of uncertainty or instability. While Keynes (1936) definition may appear more restrictive in scope, it nonetheless captures a fundamental aspect of human behavior relevant to economic analysis. The concept of animal spirits, as conceived by Keynes (1936) underscores the importance of understanding the innate drives and impulses that shape individual and collective decision-making processes in economic contexts. In this sense, both definitions contribute valuable insights into the psychological underpinnings of economic behavior, albeit with differing degrees of specificity and breadth.

2. LITERATURE REVIEW

Posner's (2009) contention is that economists have encountered difficulties in comprehending the functioning of the economy. This challenge stems from the waning significance of the hypothesis of rationality, particularly in conjunction with the efficient-market hypothesis. These theories have faltered in elucidating the discrepancies observed between stock prices in international markets and their underlying fundamental values, as well as the notable surge in trading volume over the past five decades. The efficient markets hypothesis posits that asset prices effectively aggregate and reflect all pertinent fundamental information, thereby furnishing accurate signals for resource allocation. However, the erosion of confidence in these hypotheses necessitates the consideration of alternative variables to elucidate the mechanisms governing economic operations. This reevaluation reflects a recognition that traditional frameworks may no longer suffice in capturing the complexities of real-world economic phenomena. Consequently, there is a growing imperative to broaden the analytical toolkit and incorporate new factors that can offer insights into the dynamics of economic behavior. Posner's (2009) argument underscores the evolving nature of economic inquiry and the ongoing quest to refine theoretical frameworks in response to empirical realities. By acknowledging the limitations of established paradigms and advocating for the exploration of novel explanatory variables, economists can strive towards a more comprehensive understanding of economic dynamics in contemporary contexts.

Akerlof and Shiller (2009) propose a departure from the traditional rationality-based explanations for stock market volatility and trading volume. Instead, they introduce the concept of "animal spirits" to account for the dysfunction observed in financial markets. They argue that the failure of investors to rationally anticipate future incomes and stock returns contributes significantly to economic instability. Building upon Keynes (1936) General Theory, they posit that incorporating animal spirits into macroeconomic theory is essential for a more accurate understanding of economic dynamics. The notion of animal spirits encompasses beliefs and sentiments that are often overlooked or marginalized in conventional economic models. By emphasizing the role of psychological factors in shaping economic behavior, Akerlof and Shiller advocate for a more holistic approach to economic analysis. They contend that incorporating these elements into theoretical frameworks can provide valuable insights into the workings of the economy, shedding light on phenomena that are not adequately captured by traditional rationality-based models. In essence, Akerlof and Shiller (2009) work underscores the importance of considering psychological factors alongside traditional economic variables when seeking to understand the complexities of economic behavior. By acknowledging the influence of human psychology on decision-making processes, economists can develop more nuanced models that better reflect the realities of economic activity.

Akerlof and Shiller (2009) suggest that the ongoing financial crisis exemplifies the impact of shifts in human psychology on economic outcomes. They argue that fluctuations in confidence, temptations, envy, resentment, and illusions among investors played a significant role in precipitating the crisis. This phenomenon, termed "animal spirits," refers to the irrational behavior exhibited by individuals in response to changing psychological factors. The concept of animal spirits encompasses a range of non-rational behaviors that deviate from traditional economic models based on rational expectations. These behaviors include sentiment-driven decisions, herd behavior, and exaggerated responses to perceived threats or opportunities in the market. By acknowledging the influence of these psychological factors, Akerlof and Shiller (2009) Shiller seek to provide a more comprehensive explanation for economic phenomena that cannot be fully explained by rationality-based theories alone. In essence, the notion of animal spirits highlights the importance of understanding the role of human psychology in shaping economic behavior. By recognizing the impact of emotions, biases, and social dynamics on decision-making processes, economists can develop more nuanced models that better capture the complexities of real-world economic interactions.

Keynes (1936) offers a nuanced perspective on animal spirits, characterizing them as the impulsive drive to take action rather than remain passive. In his framework, decisions with far-reaching consequences, unfolding over an extended period, often stem from these animal spirits. Unlike a calculated assessment based on the quantitative estimation of benefits and probabilities, decisions driven by animal spirits are propelled by an innate urge for action.

This definition emphasizes the element of spontaneity and emotional impulse in human decision-making, contrasting it with the rational deliberation associated with conventional economic models. Keynes (1936) conception of animal spirits does not incorporate rationality as a defining feature. Instead, it underscores the role of subjective feelings, instincts, and emotions in shaping behavior and driving economic activity. By highlighting the presence of animal spirits in decision-making processes, Keynes (1936) emphasizes the limitations of purely rational approaches to understanding human behavior in economic contexts. He suggests that factors such as sentiment, confidence, and psychological states play a crucial role in influencing economic outcomes, alongside more conventional considerations of utility maximization and rational choice. Akerlof and Shiller (2009) expand upon Keynes (1936) concept of animal spirits by incorporating additional dimensions such as optimism and pessimism. In their interpretation, animal spirits encompass not only spontaneous behavior but also the influence of optimistic and pessimistic beliefs on decision-making processes. This broader definition recognizes the impact of subjective perceptions and emotional states, including varying levels of confidence, hopefulness, and apprehension, in shaping economic behavior. By incorporating optimism and pessimism into the concept of animal spirits, Akerlof and Shiller (2009) extend its explanatory power to encompass a wider range of human emotions and attitudes. They argue that shifts in sentiment, driven by changing perceptions of economic prospects and risks, can have significant implications for economic outcomes. This perspective emphasizes the role of psychological factors in driving fluctuations in economic activity and asset prices, alongside more traditional economic fundamentals.

In essence, Akerlof and Shiller (2009) interpretation of animal spirits provides a framework for understanding how emotional states and subjective beliefs influence economic decision-making, contributing to fluctuations in market behavior and outcomes.

Ciccone (2003) and similar earlier studies have shed light on the significant influence of investor sentiments and behaviors on stock market dynamics. These studies highlight how investor optimism and pessimism can manifest in stock prices, driving fluctuations and shaping market trends. By examining the interplay between psychological factors and market outcomes, researchers gain insight into the complexities of investor decision-making and the underlying drivers of market movements. Investor sentiments, characterized by varying levels of optimism and pessimism, often dictate market sentiment and influence trading behaviors. When investors are optimistic about the prospects of a particular stock or the broader market, they may exhibit a greater willingness to buy, leading to upward pressure on prices. Conversely, during periods of pessimism, investors may become more risk-averse, leading to selling pressure and downward price movements. Understanding the role of investor sentiments is essential for comprehending market dynamics and anticipating price movements. By analyzing the relationship between investor behavior and market outcomes, researchers can uncover valuable insights into the mechanisms driving stock market volatility and identify potential sources of market inefficiency.

Haruvy et al. (1999) provide insights into the behavior of optimistic investors, characterizing them as individuals who favor strategies offering the potential for high payoffs. In their research, optimistic investors are depicted as individuals motivated by worst-case scenarios, prompting them to opt for actions perceived as secure. By framing optimistic investors in this context, (Haruvy et al., 1999). shed light on the decision-making processes of individuals exhibiting optimistic tendencies in investment scenarios. These investors prioritize potential gains and may be inclined to pursue strategies perceived as offering favorable outcomes, even in the face of uncertainty or risk. Understanding the characteristics and preferences of optimistic investors is crucial for comprehending market dynamics and investor behavior. By recognizing the motivations driving optimistic decision-making, researchers and market participants can gain valuable insights into the factors influencing investment choices and market outcomes. The insights provided by Haruvy et al., (1999) contribute to a broader understanding of investor behavior and its implications for financial markets. By delineating the traits and tendencies of optimistic investors, their research enhances our understanding of how psychological factors shape investment decisions and market dynamics.

Weinstein (1980, 1986, 1989) and Otten (1989) posit that optimistic investors hold a belief that positive events are more likely to occur to them personally, while negative events are less likely. Conversely, pessimistic investors tend to believe they are more susceptible to negative events and less likely to experience positive outcomes compared to others. These beliefs influence trading behavior, with optimistic investors driving increased trading activity and pessimistic investors reducing their trading. The observations made by Weinstein (1986), Otten, (1989) and other researchers align with the perspective presented by Akerlof and Shiller (2009) regarding the significant role played by non-rational investor behavior, including sentiments of optimism and pessimism, often referred to as "animal spirits." King (2009) concurs with this view, emphasizing the impact of behavioral biases on economic fluctuations. He suggests that these biases, rooted in sentiments such as optimism and pessimism, contribute substantially to the dynamics observed in the economic sphere. By acknowledging the influence of investor sentiments and behavior biases on market activity, researchers gain insight into the mechanisms driving fluctuations in financial markets. The recognition of these psychological factors underscores the complexity of market dynamics and highlights the importance of considering non-rational elements in economic analyses.

Optimistic and overconfident investors often exhibit a preference for risky investments, displaying irrational trading behaviors that can contribute to abnormal levels of volatility in both trading volumes and stock returns. Empirical studies have demonstrated that these irrational behaviors are not confined to specific markets but extend to international stock exchanges, exerting significant influences on price variability (Chuang et al., 2010). The spontaneous nature of investor behavior emerges as a key factor in understanding the fluctuations in trading volumes and subsequent movements in stock prices within international financial markets. This behavior reflects the impact of investor

sentiments and irrational decision-making processes, which can lead to unpredictable shifts in market dynamics. As such, the role of investor psychology in shaping market outcomes cannot be overlooked, underscoring the importance of considering behavioral factors alongside traditional economic models when analyzing market behavior and trends. The incorporation of animal spirits into economic analysis represents a departure from traditional models based solely on the assumption of rationality. This departure reflects a growing recognition among economists that human behavior in economic contexts is often driven by emotions, perceptions, and social dynamics, rather than purely by rational calculations of utility and profit. By expanding the concept of animal spirits to encompass a wide range of human sentiments, including optimism, pessimism, overconfidence, and fairness considerations, researchers can better capture the nuances of decision-making processes in various economic settings. For example, optimistic investors may exhibit a greater willingness to take risks and pursue potentially high-payoff opportunities, while pessimistic investors may adopt a more cautious approach, leading to differential impacts on asset prices and trading volumes. Moreover, the influence of animal spirits extends beyond individual investors to encompass broader market dynamics and macroeconomic phenomena. Changes in investor sentiment can trigger herd behavior, market bubbles, and sudden shifts in asset prices, contributing to market volatility and systemic risks. Similarly, shifts in consumer confidence can impact aggregate demand, investment decisions, and overall economic activity.

In this context, understanding and modeling animal spirits offer valuable insights for policymakers, investors, and other stakeholders seeking to navigate the complexities of modern economies and financial markets. By accounting for the role of human psychology and sentiment in economic decision-making, economists can develop more robust models and strategies for analyzing and managing risk, promoting stability, and fostering sustainable growth (Akerlof and Shiller, 2009; Keynes, 1936). Previous literature (De Bondt and Thaler, 1985, 1987; Barberis et al., 1998; Daniel et al., 1998) relates the volatility in stock prices and the price anomalies to the presence of under-reactions and overreactions. Under-reactions and overreactions are driven by pessimistic, optimistic, as well as overconfident investors. Pessimistic investors have more aversion to risk and decrease their trading once they realize negative results. However, they don't increase their trading when they realize an abnormal gain. In opposition, optimistic and overconfident investors increase their trading after an abnormal gain, but they maintain normal trading when losses occur. Several studies show that fluctuations can occur even if fundamental conditions remain unchanged over time. In this given case, fluctuations are attributed to the random wave of investors' beliefs that are related to fundamental conditions such as the sentiment of optimism and that of pessimism (see, Azariadis, 1981; Woodford, 1988).

Overconfident investors tend to rely too heavily on their own abilities and information, often disregarding or undervaluing external sources of information available to them (Daniel et al., 1998). Their tendency to overestimate their skills and underestimate the skills of others leads them to react impulsively to private information while neglecting the significance of public information (Odean, 1998). This asymmetric reaction pattern of overconfident investors results in a tendency to underestimate their exposure to risks and to engage in more aggressive trading behaviors, ultimately driving up trading volumes. Numerous studies support the notion that overconfidence significantly impacts trading volume. Researchers such as De Long et al., (1991), Kyle and Wang (1997), Benos (1998), Odean (1998), Wang (1998, 2001), Daniel et al., (2001), Hirshleifer and Luo (2001), and Scheinkman and Xiong (2003) have all contributed to the understanding of how overconfidence influences investor behavior and market dynamics. In particular, Gervais and Odean (2001) developed a model that suggests overconfident investors attribute market gains to their own abilities and information, leading them to overreact following periods of market success. De Bondt and Thaler (1995) argue that overconfidence is a critical factor in explaining the trading puzzle, emphasizing its pivotal role in driving market dynamics. Their assertion underscores the importance of considering behavioral biases, such as overconfidence, in understanding the complexities of financial markets and investor decision-making processes.

3. DATA AND METHODOLOGY

Different markets in developed countries are considered to investigate the relationship between trading volume, on the one hand, and on the other hand, rational expectation and the proxy of animal spirits and investors' sentiment. Five international markets are considered, which are the U.S. Stock Market (Nasdaq), the Japanese Stock Market (Nikkei 225), the U.K stock Market (FTSE100), The French Stock Market (CAC40) and the Swiss Stock Market (SSMI). Data is available online on the Yahoo Finance pages and on the website of each Stock Market. After retreating to avoid non trading days (weekend and other non trading days) for each market, the final sample includes 2311 observations for the Japanese Market and the French Market, 2263 observations for the U.K. Market, 1819 for the U.S. Market and finally, 1786 observations for the specific case of the Swiss Market. The model includes five independent variables: **R**ational expectation, **O**ptimism, **P**essimism, **O**verconfidence and **S**pontaneous reaction (ROPOS) in order to explain the excessive trading volume such as measured approximately by the natural logarithm of trading volume in the date t ($Ln(TV_t)$). The model to estimate can be presented as follows:

$$V_t = \alpha_0 + \alpha_1 RatExpec_t + \alpha_2 Optim_t + \alpha_3 Pessim_t + \alpha_4 Overconf_t + \alpha_5 Spontreact_t + \varepsilon_t \quad (1)$$

V_t: represents the natural logarithm of the trading volume in the time t;

$RatExpec_t$: represents the returns rationally expected by rational investors at the time t considering available information at the time (t-1);

$Optim_t$: represents the returns expected by optimistic investors at the time t considering available information at the time (t-1);

$Pessim_t$: represents the returns expected by pessimistic investors at the time t considering available information at the time (t-1);

$Overconf_t$: represents the returns expected by overconfident investors at the time t considering the gains they realized at the time (t-1);

$Spontreact_t$: represents the random return that has been observed at the time (t-1) and inducing a random reaction at the time t;

ε_t : is the error term

4. RESULTS AND DISCUSSIONS

Table 1 presents summary statistics for returns and trading volume across different markets, including Japan, the US, France, the UK, and Switzerland. For Japan, the mean return is nearly zero, with a minimum and maximum return of -0.1211103 and 0.1323459, respectively. The standard deviation indicates relatively low volatility, and the distribution exhibits a slight left skewness and heavy tails. Trading volume in Japan shows moderate variability with a right skewness and heavy-tailed distribution. In the US, returns have a small positive mean with relatively low volatility. The trading volume is characterized by a higher mean and extremely heavy-tailed distribution, suggesting significant variability and outlier presence. For France, the UK, and Switzerland, returns show similar characteristics across markets, with variations in mean, maximum, minimum, and standard deviation. Trading volume exhibits moderate variability across these markets, with skewness and kurtosis indicating different degrees of distributional asymmetry and tail heaviness. These statistics provide valuable insights into the behavior and characteristics of returns and trading volume in each market, aiding risk assessment and investment decision-making processes.

Table 1: Summary Statistics for Returns and Trading Volume

Market	Variables	Obs.	Mean	Max	Min	Sd	Skewness	Kurtosis
Japan	Return	2311	-0.0001266	0.1323459	-0.1211103	0.0160059	-0.5199366	10.85016
	Trading		12.3362	20.84374	8.070906	2.321057	2.932268	9.91585
US	Return	1819	0.0003845	0.1184933	-0.1111493	0.0156401	-0.044101	8.409273
	Trading		21.37196	25.56454	17.27309	0.2814666	-0.523498	67.95256
France	Return	2311	0.0001266	0.1211103	-0.1323459	0.0160056	0.5198367	9.95241
	Trading		14.33762	22. 46374	9.071106	2. 210156	2.823269	9.86514
UK	Return	2263	0.0001262	0.0938424	-0.0926455	0.0128501	-0.1106145	10.65903
	Trading		21.00541	21.73781	18.01672	0.3774095	-1.502721	8.069739
Switzerland	Return	1786	0.0000531	0.1078764	-0.0810779	0.0123152	0.0241949	9.981337
	Trading		17.9338	19.56444	16.24909	0.4080997	0.1353175	3.816379

Table 2 displays the outcomes of the Dickey-Fuller unit root test, examining the stationarity of trading values across different stock markets. Each market's trading value serves as the dependent variable, while various independent variables, including optimism, pessimism, spontaneous reaction, overconfidence, and rational expectation, are analyzed. In Japan, the test statistics range from -2.916 to -45.555 across the different independent variables. Similarly, for the US, France, the UK, and Switzerland, the test statistics vary within distinct ranges, reflecting the nuances in each market's trading dynamics. These test statistics are critical in determining whether the trading values exhibit stationarity over time. A more negative test statistic indicates stronger evidence against the presence of a unit root, suggesting that the series is stationary and follows a stable trend. Conversely, less negative or positive values may suggest non-stationarity, indicating potential trends or structural breaks in the trading values. By examining the Dickey-Fuller test results for each market, analysts can better comprehend the underlying patterns and behaviors influencing trading activity. This understanding aids in making informed decisions and predictions regarding market movements and investor sentiment.

Table 2: Dicky Fuller Unit Root Test

Stock Market	Dependent variable	Independent variables				
	Trading value	Optimism	Pessimism	Spontaneous reaction	Overconfidence	Rational expectation
Japan	- 2.916	- 45.555	- 39.583	- 45.209	- 43.369	- 28.872
U.S.	- 15.194	- 47.491	- 43.981	- 43.513	- 45.562	- 13.151
France	- 8.946	- 43.903	- 40.161	- 44.778	- 45.263	- 23.636
UK	- 3.217	- 38.227	- 33.263	- 43.726	- 45.008	- 13.652
Switzerland	- 17.337	- 39.560	- 40.805	- 42.753	- 43.777	- 43.246

Table 3 presents the results of regressions conducted for different stock markets, exploring the relationship between independent variables such as optimism, pessimism, spontaneous reaction, overconfidence, rational expectation, and the dependent variable. In Panel A, focusing on Japan, the coefficients for each independent variable are estimated. Optimism shows a positive coefficient of 2.813, with a t-statistic of 2.36, indicating a statistically significant

relationship (** denotes significance at 1% level). Pessimism, spontaneous reaction, and overconfidence also exhibit statistically significant coefficients, while rational expectation shows a non-significant coefficient. Moving to Panel B, analyzing the US market, optimism demonstrates a stronger positive relationship with a coefficient of 2.891 and a higher t-statistic of 4.65. Pessimism, spontaneous reaction, and overconfidence also display significant coefficients, whereas rational expectation shows a non-significant coefficient. Panel C delves into the French market, particularly focusing on a pessimistic population. Here, the coefficients for optimism, spontaneous reaction, and rational expectation are statistically insignificant, while pessimism exhibits a significant negative coefficient. In Panel D, examining the UK market, optimism once again displays a significant positive coefficient, along with spontaneous reaction and overconfidence. Pessimism also shows significance but with a negative coefficient. Lastly, Panel E concentrates on Switzerland, where optimism demonstrates a remarkably strong positive relationship, followed by statistically significant coefficients for pessimism and spontaneous reaction. Overconfidence and rational expectation show non-significant coefficients in this context. These regression results provide valuable insights into the impact of various psychological factors on stock market behavior across different countries, aiding investors and analysts in understanding market dynamics and making informed decisions.

Table 3: Results of Regressions

Stock Market	Independent Variables	Coef.	t-statistic	
Panel A:	Optimism	2.813	2.36**	R-square
Japan	Pessimism	-1.839	-1.58	0.2836
(optimistic	Spontaneous reaction	-1.614	-2.23**	
population)	Overconfidence	4.779	3.19***	Aj. R-square
	Rational expectation	-0.007	-0.16	0.2817
	Cons_	2.251	4.28***	
	Optimism	2.891	4.65***	R-square
Panel B:	Pessimism	-3.990	-6.65***	0.3081
US	Spontaneous reaction	-0.426	-0.48	
	Overconfidence	1.091	2.93***	Aj. R-square
	Rational expectation	-1.091	-.38	0.3058
	Cons_	4.350	9.88***	
Panel C:	Optimism	0.902	0.87	R-square
France	Pessimism	-3.620	-3.70***	0.2279
(pessimistic	Spontaneous reaction	-2.248	-3.63***	
population)	Overconfidence	-1.936	-1.34	Aj. R-square
	Rational expectation	0.003	0.33	0.2258
	Cons_	2.995	4.31***	
	Optimism	1.953	3.21***	R-square
Panel D:	Pessimism	-1.446	-2.31**	0.3707
UK	Spontaneous reaction	1.296	2.33**	
	Overconfidence	2.0573	2.01**	Aj. R-square
	Rational expectation	0.001	0.08	0.3690
	Cons_	3.252	8.72***	
	Optimism	2.127	6.86***	R-square
Panel E:	Pessimism	-1.896	-4.27***	0.2235
Switzerland	Spontaneous reaction	-1.725	-2.62***	
	Overconfidence	-0.817	-0.54	Aj. R-square
	Rational expectation	-0.004	-0.78	0.2208
	Cons_	7.871	8.11	

5. CONCLUSIONS

The aim of this paper is to delve into the role of human psychology in shaping the variability of trading volume within financial markets. By focusing on psychological factors such as investor sentiment, optimism, pessimism, and overconfidence, the study seeks to elucidate how these elements contribute to fluctuations in trading activity. Understanding the psychological underpinnings of market behavior is crucial for comprehending the dynamics of financial markets. By investigating how human emotions and cognitive biases influence trading volume, the research aims to provide valuable insights into the drivers of market volatility and liquidity. Through empirical analysis and statistical modeling, the study aims to quantify the impact of psychological factors on trading volume. By examining data from various international stock markets, the research seeks to identify patterns and trends that shed light on the relationship between investor sentiment and market activity. Ultimately, the goal of this paper is to enhance our understanding of the complexities of financial markets by integrating insights from psychology and behavioral

economics. By acknowledging the role of human psychology in driving market dynamics, the research aims to contribute to more informed decision-making processes for investors, policymakers, and market participants alike. The study examines various human aspects, including optimism, pessimism, overconfidence, and rational anticipations, to gauge investor sentiment and assess their influence on trading volume. By analyzing these psychological factors, the research aims to uncover their impact on market dynamics and trading behavior. To conduct this investigation, the study utilizes daily data from five prominent international stock markets: the U.S. stock market, the Japanese Stock market, the U.K stock market, the French stock market, and the Swiss stock market. By examining data from these diverse markets, the research seeks to capture a comprehensive picture of how investor sentiment affects trading volume across different geographical regions and market conditions. Through rigorous statistical analysis and modeling techniques, the study aims to quantify the relationship between investor sentiment and trading volume in each market. By exploring patterns and correlations within the data, the research endeavors to elucidate the mechanisms through which psychological factors influence market activity. By considering daily data from multiple international markets, the study seeks to provide robust empirical evidence regarding the impact of investor sentiment on trading volume.

The findings from this research have the potential to inform investment strategies, market regulations, and policy decisions aimed at promoting market efficiency and stability in an increasingly interconnected global financial landscape. In the major markets studied, such as the U.S., Japanese, U.K., French, and Swiss markets, excessive trading volume can be attributed to the presence of optimistic, pessimistic investors, and those with spontaneous reactions. These psychological factors play a significant role in driving trading activity and influencing market dynamics. However, two specificities stand out in the Japanese and French markets. These markets exhibit unique characteristics that distinguish them from others and shape the behavior of market participants. In the Japanese market, for instance, there may be a greater prevalence of investor sentiment driven by cultural factors and unique market dynamics. Cultural attitudes towards risk-taking, investment behavior, and the role of institutions in the market may contribute to distinctive patterns of trading volume and investor sentiment. Similarly, the French market may exhibit its own idiosyncrasies, influenced by factors such as regulatory environment, investor preferences, and economic conditions. These factors can influence the degree of optimism, pessimism, and spontaneous reactions among market participants, thereby shaping trading volume and market activity. By identifying these specificities in the Japanese and French markets, the study aims to provide insights into the nuanced interplay between investor sentiment and trading volume across different market contexts.

Understanding these unique dynamics is essential for devising effective investment strategies and regulatory measures tailored to the specific characteristics of each market. In the Japanese market, the fluctuation of trading volume is influenced by the presence of both overconfident and optimistic investors. These investors may exhibit a higher propensity for risk-taking and aggressive trading strategies, contributing to increased volatility in trading volume. Conversely, in the French market, the presence of more pessimistic investors appears to have a larger influence on the evolution of trading volume. These investors may adopt a more cautious approach, leading to fluctuations in trading volume driven by risk aversion and conservative investment behavior. Building upon the findings of this study, further research could explore the role of behavioral biases and investor sentiment in explaining variations in trading volume over different time periods. Investigating how these factors contribute to fluctuations in trading activity across days, weeks, months, and years could provide valuable insights into market dynamics and investor behavior over time. Moreover, extending the analysis to examine the impact of behavioral biases and animal spirits on the broader financial landscape, including the occurrence of significant financial recessions, would offer valuable insights. Understanding how investor sentiment and psychological factors contribute to market downturns and periods of economic instability could inform policymakers, regulators, and market participants in mitigating systemic risks and promoting financial stability.

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