T.C.
ISTANBUL COMMERCE UNIVERSITY

GRADUATE SCHOOL OF FINANCE

MASTER OF INTERNATIONAL FINANCE

THE EFFECT OF INVESTOR'S BEHAVIORAL BIASES ON THE TRADING VOLUME IN G7 AND BRICS STOCK MARKETS

MA Thesis
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Abstract

This thesis work aims to test the effect of investor's behavioral biases on trading volume in G7 and BRICS country's stock markets. A linear regression model is used to test the relationship between trading volume and rational expectations, overconfidence, excessive optimism, and excessive pessimism. I found that there are certain similarities and differences among developed and developing stock markets. The analysis revealed that the rationality hypothesis can be rejected for all the markets except the case of Germany. The Italian and Russian markets show no influence of investor's biases on trading volume. The findings indicate that six of the markets have similar behavioral characteristics. Excessive optimism and excessive pessimism have a significant impact on trading volume in Canada, France, United Kingdom, United States, Brazil, and South Africa.

Keywords: Excessive optimism, excessive pessimism, overconfidence, capital markets

Özet

Bu çalışma, yatırımcının davranış yanlılıklarının G7 ve BRICS ülke borsalarındaki işlem hacmine etkisini test etmeyi amaçlamaktadır. İşlem hacmi ve rasyonel beklentiler, aşırı güven, aşırı iyimserlik ve aşırı kötümserlik arasındaki ilişkiyi test etmek için doğrusal bir regresyon modeli kullanılır. Gelişmiş ve gelişmekte olan borsalar arasında bazı benzerlikler ve farklılıklar olduğunu buldum. Analiz rasyonellik hipotezinin Almanya dışındaki tüm pazarlar için reddedilebileceğini ortaya koydu. İtalyan ve Rus piyasaları yatırımcının önyargılarının ticaret hacmi üzerinde hiçbir etkisi olmadığını göstermektedir. Bulgular, pazarların altısının benzer davranış özelliklerine sahip olduğunu göstermektedir. Aşırı iyimserlik ve aşırı kötümserlik Kanada, Fransa, İngiltere, ABD, Brezilya ve Güney Afrika'daki ticaret hacmi üzerinde önemli bir etkiye sahiptir.

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LIST OF ABBREVIATON

MPT: Modern portfolio theory

EMH: Efficient Market Hypothesis

BAPM: Behavioral Asset Pricing Model

WFE: World Federation of Exchange

IMF: International Monetary Policy

RTS: Russian Trading System

1. INTRODUCTION

In financial markets, the changes in return are always effecting the trading decision of investors, on a daily base when investors notice an increase or decrease of return according to their psychological factors they will make a prediction about the future and decide to trade or to skip the transaction. A human being in terms of their psychological factors is different from each other, obtaining a standard model that characterize each type of investor's psychological phenomena is a hard task to do, it requires a deep knowledge of understanding the phycology of investors, which is not a stable factor and it changes according to many other factors, such as risk, profit, loss, and every single sign of any current or future event, building up those factors into logical or mathematical formulas, to be tested empirically, needs a lot of effort, however academic literature examines a large number of different psychological factors that influence their financial decisions, these behavioral phenomena have been proven by many researchers as the main reason behind the way of driving financial choices while trading in the market, This work focuses on three behavioral biases. Overconfidence, excessive optimism, and excessive pessimism. I also added the rational expectation factor in the analysis to provide empirical evidence of the irrationality hypothesis.

The literature review provides a historical background of the traditional financial theories and how the behavioral finance improve it, to be more flexible with the real world, moving forward to explain the relationship between investors psychology and financial choices, summarizing substantial theories in the behavioral finance filed such as the famous work of animal spirit for the British economics Keynes(1936), The prospect theory for (Kahneman an Tversky:1979), and many other works for categorizing the irrational investors into categories and analyze each physiological phenomena and link it to related variables in the financial markets (e.g., Shiller 2000 Shefrin;2005; Ackert&Deaves;2010).More specifically I introduce the categories of investor's behavioral phenomenon, in term of biases and heuristic, focusing on all what has been done of researches on the three chosen behavioral biases in this analysis.

The main goal of financial markets especially in the stock exchange market is to assist the trading transactions and so, the analysis of trading volume is incentive because it affects the overall atmosphere of financial decisions. Financial literature is involved with a comprehensive understanding of trading volume activities and for better perception, many studies try to analysis the factors that are correlated with trading volume activities as an example changes in stock prices, volatility, changes in return, dispersion in investor's expectations and different types of information, earning announcement, financial crisis events and other potential risks,(Baker and Stein 2004; Lo and Wang 2006; Hong and Yu 2009) and many others. In my research, I focused on the changes of the daily returns that are correlated with investor's sentiment and effecting the trading volume joining the growing literature that focus on a various behavioral factor that affects trading volume such as (Barber & Odean 2008; Huddart et al. 2009; Operan et al 2015 , Dhaoui 2015).

The model that I mostly depend on in my work is based on the studies of Dhaoui (2015:20), Oprean et al (2015:1715), and Galanidis (2015:19). The data used in the analysis contains the stock market index returns and trading volume on a daily base, for the period of five years (2015 to 2020) creating twelve samples of each country's main market indexes that are ; S&P TSX, CAC-40, DAX, FTSE MIB, NIKKEI 225, S&P/TSX, IBOVESPA, MOEX, NIFTY 50, SSEC, FTSE/JSE.

Three behavioral biases, to be tested on G7 and BRICS capital markets, G7 countries include Canada, France, Germany, Italy, Japan, UK, and the USA. and those seven countries are the seven IMF advanced developed economies in the world, the choice of BRICS countries that are Brazil, Russia, India, China, and South Africa, was mainly to be able to make a comparison of G7 and BRICS of each stock market characteristics, especially after the noticeable growth of BRICS countries and the rise of BRICS stock markets being an alternative opportunity for international investments.

1.1 Purpose of the study:

The specific goal of this work, is to test the effect of investor's behavioral biases on the trading volume in BRICS and G7 countries, the chosen biases are Overconfidence, Excessive optimism, Excessive pessimism, in addition to rational expectation factor as empirical evidence of the irrationality hypothesis. Another purpose is to make a comparison among developed and developing countries in terms of investor's behavioral biases and their level of rationality while trading in stock markets and look for the similarities, differences, and the unique characteristics of G7 and BRICS market participants.

1.2 Research Hypothesis.

H1: Overconfidence, Excessive optimism, Excessive pessimism, Rational expectations, have an influence on the trading volume, in G7 and BRICS stock markets.

H0: Overconfidence, Excessive optimism, Excessive pessimism, Rational expectations, have no influence on the trading volume, in G7 and BRICS stock markets.

1.3 Relevance of the study:

The unique advantage of this paper is that it includes a comprehensive and updated data of a sample including the top developed and developing economies counties globally ''G7 and BRICS countries'', This paper gives empirical evidence of the main investor's biases that drive the trading volume transactions in these twelve tested capital markets and gives the advantage of making easy to compare each market characteristics separately.

In the financial literature, this work is important for researches because it proved empirically the irrationality characteristic of each market and make it easier for other researchers to make studies on other different markets for picturing a global view of how the real trading decisions are made by investors around different markets and different cultures , and to study the effect of their sentiment on the trading volume which is an

important variable in financial markets and until now, studies are working hard for understanding all the factors correlated with the changes in trading volume.

The work is collaborating with other researches for filling the gap of irrationality choices made by investors depending on their behavioral biases that dissolve the rational choices, and on the practical side when investors are aware of this fact, they will reduce the reaction according to their main characteristics, and try to eliminate their biases for taking more rational choices. The findings are also relevant for financial advisors, to have a base knowledge about these physiological factors that drive the trading volume and affect the prices and the overall health of the financial markets, for making better and more efficient recommendations.

1.4 Research structure:

My thesis paper is designed into six sections, section 1 covers the introduction, with a brief background of the topic and the main purpose and relevance of the study, section two is the literature review including the historical growth of behavioral finance, and the alternative behavioral theories of the traditional financial theories, introducing the categories of investor's behavioral phenomena, moving forward to review the literature of the three chosen investor's behavioral sentiment in this thesis paper, and explain the link between those biases and the trading volume , section 3 introduce a global economic picture of the chosen countries, pointing out the rise of BRICS group, and provide a brief analysis of each stock market's characteristics, and make a comparison among G7 and BRICS stock markets. Section 4 is the data and methodology part, section 5 summarize the empirical findings of the analysis, and the last section is the discussion and the conclusion of the paper.

2. LITRUTURE REVIEW

How does behavioral finance change our way of understanding the real financial markets? What are investor's sentiments and biases? And what is the relation between trading volume and these sentiments and biases? why market participants are taking different trading choices from each other while they have the same available information? Why do we have irrational decisions? and what are the implications of irrationality in financial markets?

The first section in the literature review mainly about the traditional financial theories that have been improved by behavioral financial theories to fit the real world , the second section is explaining the heuristic and biases of investors , and in details reviewing the three behavioral biases which I focused on in this study, the third section is defining the rational expectations theory and how a market could be driven by rational investors , the last section is explaining the link between the investor's biases and the trading volume in financial markets.

2.1 Traditional finance vs behavioral financial theories

For a long period, the economic and financial literature based on standard market theories that state markets are efficient, investors have rational way of thinking and they build their portfolios based on mean-variance, and the expected return is always compared to the risk. Behavioral finance improves with respect for each of these theories and provides a relevant explanation of each one in the real world, starting from pointing out that investors are normal, they are not completely rational, and markets are inefficient even when it has difficulties to be beaten during the trading transactions. In this section, we are going to introduce the main differences between traditional and behavioral financial theories for a better understanding of the real world.

2.1.1 Traditional financial theories

The traditional financial literature introduces the first concepts of understanding investors behavioral and their wellness of trading regarding their levels of risk acceptance, the Expected Utility Theory by (Bernoulli: 1738) focused on the fact that investors are building their decision under risk by calculating the expected utility values of the other investment opportunities, and it state that the rational people whom are trying to maximize their expected utility of an investment. This theory categorizes the decision-makers into three levels of risk taken; the first type of investors is risk-averse, the second is risk-neutral and the third type is risk loving investors, Besides, it points out the difference between investor's behavioral in decision making under risk and it was a relevant and base important theory in the financial literature for long period.

Another important theory in traditional financial literature was the MPT modern portfolio theory by (Markowitz:1952) who introduce the portfolio selection model in his paper "Portfolio Selection,". Using the efficient frontier tool of asset chosen regarding return and risk tolerance. It describes the steps of building an optimal portfolio by diversification the several types of securities regarding each level of risk. , Later on, MTP introduce the concepts of one of the most famous asset pricing models in financial literature which are the CAPM and it's widely used model for pricing risky securities.

The CAPM model that explains link between expected return and the systematic risk of assets, particularly stocks, it helps the investors for better calculating the extra return they will make while taking riskier choices compared with the risk-free rate, in another word it evaluates whether a stock is fairly valued comparing to certain level of risk and evaluate the time value of money compared to its expected return. The CAPM model has been widely used due to its simplicity , (Bodie et al., 2009) gives an assumption on the CAPM model that the huge number of individuals in the market is representing the total amount of wealth , and each individual in the market with a certain small amount of wealth which is small as compared to the total wealth of all investors , while investors are price taker and security prices are not affected by trading transactions , it also assume that investors are not paying taxes on the return they earn and there are no transaction costs by trading securities ,

and the most important assumption that has been changed by behavioral finance , is that CAPM assumes that all investors have rational ways of thinking and they build their portfolio choices regarding the tradeoff relation between return and risk , it also tell the investors to mimic the market portfolio that is optimal and all its securities included in , is fairly priced , in addition of the assuming that are investors are having homogenous expectations and they act in a similar way. We have also to mention that after the CAPM model produced anomalies with the market efficiency, Fama French with three-factor model 1992 has been conducted.

The capital asset pricing model assumptions give a great deal for efficient market hypothesis introduced by Fama 1970 that considered: that markets have three degrees of efficiency, strong, semi-strong, and weak efficiency, defining that when markets are efficient, security prices are reflecting all available information, and rational investors who are trying to maximize their profits while making optimal choices, and all of these assumptions lead us to say if EMH is perfectly true when markets are efficient, then no one will try to beat the market and no one need to make an analysis to reach a minimum level of profit, and it also points out that when having irrational investors and noise traders, irrationality choices and arbitrage transactions canceled each other with no effect on the prices.

2.1.2 Behavioral financial theories

As traditional finance builds its assumption into four main blocks; markets are efficient investors are rational, investors should design their portfolios by following the mean-variance rules, and the expected return in only a function of risk. The behavioral finance gives an alternative of each of these blocks with respect to each of them, stating from pointing out that investors are normal, markets are inefficient, even when it has difficulties to beat the market by trading information, and investors are not following the rules of portfolio theory and the expected return is not a function of only the risk (Statman:2008).

I will try to explain each of these alternatives by itself, after introducing the behavioral finance field. The birth of this field started since the theory of moral sentiment and wealth

of nations for (Smith,1759:38) and (smith,1776:9) he mentioned that the molarity of individuals leads them when taking economic , social , and financial choices .(Keynes,1936:35) observed the role of animal spirits of individuals, and then (kahneman et al,1979:269) introduced the prospect theory and the analysis of decisions making when it comes to risk, then we started to record the rapid growth of the behavioral finance field as (Shefrin,1994:18) developed similar model to CAPM called BAPM ‘’behavioral asset pricing model’’, this model explains the real market transactions by dividing the traders into two groups, the rational traders who build their decisions based on CAPM and the noise traders whom not following the CAPM and their expected return on securities is calculated by their behavioral betas, in (Shefrin et al,1999:16) developed Markowitz portfolio theory into BPT "behavioral portfolio theory" , the main difference is that in Markowitz theory investors build their decisions by choosing the assets regarding the mean-variance of the portfolio but in BPT investors are building their portfolios as pyramids taking into account the behavioral of investors when they estimate the expected return and the risk of each asset. And the rationality of investors started to become doubtable from the time that traditional financial theories couldn't give an efficient explanation of stock market anomalies and bubbles, a bubble occurs when market participates drive the stock price above it's fair value.

During the market bubble period investors ignored the fundamental valuation and follow the overvalued securities which increase the mispricing even more and this hot period end when companies fall to achieve their promises of a certain promised target or when the demands decline, many researchers give an explanation of the behavioral of market participants during this period as herd-mentality as the main Couse of this situation, The great achievement in behavioral finance is credited to the psychologist's D. Kahneman and A.Tversky when they provide the concept of prospect theory in (1979). This theory is considered as an alternative model of expected utility theory, it lights the way of the decision-making process of investors when evaluating gain or loses under mainly two key aspects that are; the first aspect is known as certainty effect, depending on the nature of the prospect , People sometimes are risk averse and sometimes are risk lovers and the main reason behind that is because of the people when they give lower weightage to the

outcomes which are uncertain and higher weightage those that are certain.The second aspect is that people have different choices even when having same amount of outcomes loss or gain, they react differently; giving weightage to losses higher than the weight given to gain in the same amount , and so the prospect theory developed the concepts of expected utility theory when it was focusing only about individuals that are always trying to maximize their levels of utility. the value function in the prospect theory replaces the utility function in expected utility theory, and it also gives an alternative way of using simple probabilities as in the expected utility theory, it replaces this method by using decision making weight that are a function of probability.

Later on as an alternative to the CAPM Shefrin and Statman (1994) developed (BAPM) model as explained in the previous section , After the BAPM, Shefrin and Statman in early 1999 , work again together providing an alternative to the Markowitz portfolio theory, which is the behavioral portfolio theory BPT, the main differences were in MPT investors were building their optimal portfolios regarding the mean-variance rules and the tradeoff between return and risk, and in the BPT, investors are constructing their portfolios as the pyramids of assets with several layers , while each of the layers is associated by its risk attitude and it's a specific goal, for example the base is designed to prevent financial disasters while the upper layer is designed to maximize the expected return and the main aim of this theory is to give an explanation of the human behavioral part of investors that is related to different attitude against risk.

Later on Shleifer 2000 in his work he mentioned about the impossibility for investors to behave completely rational because most of the people take the irrelevant noise into account and don’t depend on the relevant information these investors are influenced by their own biases such as framing effect loss aversion, representativeness, and overreaction.

In the EMH they assume that irrational trading transactions cancel each other randomly without affecting the stock price but Shleifer argue that irrational choices are not random because it might be to sell and buy in the same time.

In the same period of time in 2000 Shiller analyses the ups and downs of Dow Jones industrial average and the dot com market bubble in the '90s reaching a behavioral concepts

of market participants , he stressed on the behavioral effect like cultural and psychological factors that affect the individual's beliefs and so the behavior which leads to the macro-level effect and contributes of creating markets bubbles, another work for Shiller in 1981 when he found that stock prices are more way volatile than it has been mentioned in traditional financial theories'.

The traditional life-cycle model considered that rational individuals make plans for their life-time consumption taking into account the future life and so they manage to make good savings for their future and the other type of people who perceive money as completely fungible (Modigliani and Brumberg, 1954).

BLC the behavioral life-cycle model Shefrin & Thaler (1988) According to the BLC hypothesis, there are two types of people, the ones whom are planning and thinking in a more rational way about their future and so they save more amount of money, and the second type are those whom are only thinking about the current moment and the can't control their expenses or saving money for the future moment, and here we can found the for example the self-control bias.

This theory is derived from the traditional life cycle hypotheses, and it suggest that the financial behavior of people during their whole life is related to their own way of self-control and mental accounting and their rationality background while making consumption decision, all of these theories are an important work of understanding the factors that affect the saving behavior of people.

2.2 Behavioral phenomena behind investor's decision (Heuristics and biases)

Behavioral finance capture the role of psychological phenomena for both investors and managers, in this research I focused mainly on the investor's perspective, (Shefrin 2000), Classify these psychological phenomena in decision making into categories that are heuristic and biases and the framing effect. There is no academic evidence on a theory or right formula that determine each of these phenomena, definitions can explain the concept, I will focus on the heuristic and biases and more specifically on the biases by analyzing

three most common noticeable biases by investor's while trading in the market, and in details, the following sections will explain the most relevant works of analyzing those biases in the financial markets.

Hersh Shefrin (2005) define **Heuristics** as **''**a rule of thumb used to make a judgment or a decision', such as; representativeness, availability, anchoring affect , and the word heuristic is a Greek word, it means to discover or to find (Gigerenzer & Todd, 1999: 20) Many phycologist researchers agreed on the fact that heuristic is a method of making decisions in a limited time with uncertainty, and this decision is sufficient enough comparing to the time limit of processing information and decide, usually this method is used by investors and financial managers to speed up the processing time while making an investment, decisions. a heuristic method sometimes leads for an irrational and bad decision due the limited data set, but it's still considered as a good method comparing its outcome with the disadvantages of delay the decision-making process. (Ackert & deaves 2010) explain two types of heuristics, the first type when people have to make fast decisions and the stakes are low, the second type when the stakes are high and thus the effort made to take the decision is much higher.

Biases: biases have several definitions, in our scope, we consider the investor's biases as the main factor towards making irrational financial choices as Shefrin does when he defines the bias as" A predisposition toward error" , Researches in the field of behavioral finance have found many different ways to classify the biases since the humans are exposed to large number of biases, those biases despite their source , may in most of the cases deviate from rational choices, the researches try to identify factors to help better understand and categorize biases, one of the simplest ways of classifying categories is the method of Pomian 2011 when he categorizes biases into Cognitive errors and emotional biases. it's also important to light a point here that some biases have both aspects of emotions and cognitive errors, which makes it more complex to categories, however, researchers found a way to judge about it, by referencing the biases by its main cause, I will first define both types of biases in general and then focus more on the second type which is the emotional one since the three behavioral biases were chosen in this paper are derived from it.

A. **Cognitive errors biases**: as Pompian 2011 define it as a result from reasoning influenced by feelings, cognitive biases are easier to eliminate or to be corrected than emotional biases, as Pompian mentioned in his book investor's behavioral biases, about the fact that ; it is possible to educate the investors, since they have lacked in their logical way of thinking, but it's impossible to change their emotions, because it's an uncontrolled factor, and most of the cases they know that it's better to avoid the emotional part but they can't themselves control it. There are also two types of categories in the cognitive biases defined by pompian 2011 that are defined bellow;

1- **Belief perseverance biases** how people process information either logically or irrationally in financial decision making.

2- **Information processing biases;** When the way of evaluating the information is not following a logical steps or rational way of thinking.

B. **Emotional biases:** as mentioned by Pompian 2011 there is no single or universal accepted definition for emotional biases, researchers are still trying to find a better explanation of these biases and their sources, and relate it to other factors. as we can read in many psychological books, those biases come from a source that people cannot control, as a result of attitudes and feelings. emotional biases are considered also as a factor that leads to irrational choices while trading and making financial decisions in financial markets, it's harder to be corrected than cognitive errors, because it cancels the brain part of logical thinking and dominates on the human decision processes while taking the last decision, the only way to deal with the emotional biases is to recognize it and adapt to it rather than trying to correct it. we can think this way, cognitive errors are about how people think, while emotional biases are about how people feel. Examples of behavioral emotional biases; Self-control, regret aversion, affinity, Overconfidence, Excessive optimism, Excessive pessimism.

In this work I chose overconfidence , excessive optimism and excessive pessimism biases to be tested , on G7 and BRICS countries , for many reasons , the first reason is that in the behavioral finance literature most of the researchers , are testing those behavioral biases

through survey method , only few of the researches tries to tested them empirically , because it is hard to transfer the physiological factors into mathematical and logical models , and it needs a lot of effort to find standard models in the behavioral finance field , the second reason for choosing these biases because they are common observed biases in the stock market , and investors , are suffering from these biases on the daily base , for example in the case of the model I adopted by (Dhaoui:2014), it is built on the daily changes in return that effect investors emotions , and leads to irrational choices , in the methodology part , there is a detailed explanation of the sources and the way of arising those tested biases , and below I will try give an explanation of each of the three noticeable bias in the financial market during the process decision making and briefly explain what have been done in the behavioral finance literature work , specifically for those three chosen emotional biases .

2.2.1 Overconfidence

Overconfidence is defined by (Shefrin:2000) as '' people make mistakes more frequently than they believe and view themselves as better than average. (Pompian: 2011), Overconfidence can take many aspects such as better-than-average effect and self-attribution bias, and thus, it has aspects of both bias, cognitive and emotional errors, but is classified emotional because this bias is primary the results of emotions.

The concept of overconfidence biases has been found thorough a large number of researches and surveys that has been conducted in the financial markets, through the market participant, and in most of the cases they have found that those overconfidence investors they overestimate both their own predictive abilities and precision of the information they have been informed , (Pompian :2011) , in his book he also mentioned that correcting overconfidence biases is a difficult mission to do, because usually, people have difficulties to revise their self-perceptions other knowledge and abilities.

The overconfidence effect is caused by the market participant and not caused by the market, and not every overconfidence investor have the same effect on the market, (Odean:1998) in his paper with testing several market models in which investors are rational, and in which investors overweight the value of information with the different market participant and different market measures, he found out that the only market

measure in which overconfidence investors are affecting the market in the same way is the trading volume measure which indicates a similar effect of overconfidence investors by different types of market participants, another measure such as market efficiency are not the same in terms of the effect by overconfidence investors, and it depends on the way of distributing the information, and so he concludes that for studying the effect of overconfidence correctly, we need to determine first who are the market participants? and how the information is distributed? and so it's not a matter of the market efficiency degree itself , (Odean:1998) prove after this determination that the trading volume increases when price takers, insiders, or market makers are overconfident, and he also mentioned the results of overconfidence bias; it reduces the traders expected utility, it leads investors to trade excessively, and it also causes lower returns than it usually expected, that's because of underestimating the risk and overestimating the returns, overconfidence also lead investors to hold under diversified portfolios, overconfidence also increases the market depth, and overconfidence traders also increases the volatility in prices, (Hirshleifer et al:1994) prove how overconfidence can promote from herding in the securities market.

(Braber and Odean :1998) mentioned out the investors who make more trading transactions make more losses than the ones who trade less , most of the individuals see themselves better than average and better than others .(Taylor and Brown:1988) In financial market (Griffin and Tersky :1992) mentioned that not only the beginner traders exhibit overconfidence, also experts are suffering from overconfidence biases, for example when the market predictability is very low, but they also are even more overconfidence than beginner investors because they have theories and models to depend on, such as market behavior model, and so they tend to overweight their knowledge .

(Daniel, et al ,1998:15) prove how overconfidence is negatively correlated with stock prices and leads to excess volatility and stock mispricing. overconfidence is also related to the gender regarding (Barber et al,2000:18) they found out that men trade more than women by 45% and this trading reduces men's net returns by 2.65 percentage points a year as opposed to 1.72 percentage points for women. The main reason states beyond overconfidence behavior is the success (Gervais et al,2000:23) proved that when investors are having past success tries in the past it will lead to overconfidence behavior so they will underestimate

the risk and increase the trading volume in the market. (Chou et al ,2011:9) they used a model to predict about the overconfidence behavior of traders when they trade in futures contracts, so they divided traders into three main panels all traders, international and domestic traders and thus they found out that at the account level, domestic institutions and individual traders are more likely to buy (sell), and to do so more aggressively when they have experienced gains from their prior long (short) positions. And other researchers such as (Isidore et al,2018:13) tested the overconfidence behavior regarding the individual income by using a questioner approach and they found out that investors with higher income are more likely to trade with overconfidence behavioral than those with lower income. Overconfidence tends to be stronger when individuals cannot make a correct judgment about an issue, in another word when the uncertainty level is high (Shefrin: 2015).

In a paper for (Statman and Thorley vorkink :2003) they tested the theoretical model which indicates that overconfidence leads to high trading volume, and tested this fact on the American market then they found out that when returns increase individuals are more confidant and they prefer to trade more. (Glaser and weber:2003) found out that investors who think they are better than average trade more, (De bondt and thaler:1995) mentioned the main factor to be studied for explaining the trading puzzle is the overconfidence behavior, Overconfidence investors hold riskier portfolios and that is because they underestimate the variance of risky assets. Overconfidence investors also reference their past successes to their excellent skills and ignore the past frailer by relating it to their bad luck.

There are several ways for measuring overconfidence bias, the most famous method is the miscalibration method, by applying the calibration approach in most of the behavioral financial models, overconfidence is interrupted as; Investors are overestimating their knowledge and the privet signals and they underestimate the public signals, in most of the cases they hold risky portfolios or undiversified portfolios, because of their underestimation to the risk factor. And so they affect the market by, Excessive trading volume, and Misevaluation of short and long term asset and stock returns.

Other empirical studies have been conducted for measuring the overconfidence bias in the stock market (Gervais and Odean 2001, Hirshlifier et al 2001 .) one by using market-level data and what they found is a positive relationship between past return and current trading volume, in another word the market's trading volume is increased when market participants notice any increase in past returns, and this is in line with the other several papers that found a positive link between trading volume and past return by using a unique data for individuals investors and accountants.

In my paper, I depended on the return and the standard deviation of return as a measure for overconfidence, and my paper is related to very few studies in the behavioral finance field. because it represents the psychological biases made by the changes in economic variables such as returns, this method has been used first by (Dahoui 2014), in his model, and the model has been conducted for several few countries, and the main point of my analysis is to extend the sample tested by using updated data and fill this gap, in order to make it easier for comparing the G7 and BRICS countries in terms of their investor's characteristics.

2.2.2 Excessive optimism and Excessive pessimism

It is also known as market sentiment; (Shefrin:2005) defines excessive optimism as when *"People overestimate how frequently they will experience favorable outcomes and underestimate how frequently they will experience unfavorable outcomes"*.

Excessive optimism causes people to think that they are not effected by any bad event that could happened, there are many factors that lead to excessive optimism choices such as the mood, the optimistic emotions, the good weather, the information of people themselves and other people information, also the cognitive mechanism of making choices is also a factor of optimism behavior. The optimism bias not only occurs for positive events, it also occurs for negative events, for example, investors who trade more by being optimistic and they underestimate the risk factor that Couse a bad event which is the loss.

For measuring the excessive optimism bias there are several ways, most of the researchers in the phycology filed agreed on the fact that excessive optimism should be tested among the group not by asking the opinion of one person because this person might be right in some cases and conditions, and so they suggest of conducting surveys for a group of people

that are in the same level of age, and desires, and then by looking at the mean of the risk-taking level, we can judge about who is characterized by excessive optimism and who are characterized excessive pessimism, their views towards risk could be a measure for their future view of optimism and pessimism.

The excessive pessimism bias is the opposite of the excessive optimism bias, people believe that bad things will happen to them, even towards good things they have no hope, they are affected by their bad mood, bad weather, the bad experience of themselves and other bad experiences, and when they are asked about an issue the first thing comes to the mind is the bad thing, they do not look at the average experiences of others, for example when they think about driving, they directly remember the bad driver rather than the average drivers level, they don't accept the risk, they prefer to stay on the safe and the certain side, for example, in trading decisions they don't do any trading decision before they totally have the absolute and the certain information about the profits, it might be an opinion of others people who experience the same conditions.

Several papers agreed on the fact that excessive optimism leads to a higher level of trading transactions in the financial markets whereas pessimism leads to a lower trading transaction. Financial markets are almost the same as our real life, we believe that people are behaving differently and sometimes we can find different views and visions while making the same decision under the same circumstances. financial markets reflect both sides of opinions, optimism, and pessimism, and it has been proven by several studies that when investors are receiving good news they are more optimistic and they do more trading transactions and take the advantage of it, they overreact and they exceed their activities in the stock markets. And the opposite case when receiving bad news, pessimistic investors will reduce their trading transactions and they even skip to make any transaction, believing that the situation in the market will become worse in the future. As has been mentioned before by (Weinstein, 1980): optimistic investors always think that the probability of good events that could happened to them is much higher than the probability of the bad events, they think they are always in a safe position no matter the risk is.

When business is driven by emotions, mispricing occurs, because the distortion of prices from the fundamental value and the risk itself as factor misunderstood by investor's, especially the case of the optimistic news announcement, investors that are optimistic, overestimate their transaction in the market and trading activities and that leads to overreaction and therefore increase in the prices, Unfortunately, the following "news announcements are likely to contradict his optimism, leading to lower returns" (Barberis et al:1998).

Excessive optimism is a positive view of the future that occurs when investors expect an increase in the return and vice versa when they are pessimistic. as mentioned by (Toshino et al,2004:12) optimistic investors select only the good news when they make their decisions, and this will have a negative effect not only on the investors return but also on the market because as has been discussed by (Shefrin ,2011:32) excessive optimism creates speculative bubbles in the financial market. (Dhaoui,2015:12) proved how The US stock market reacts more significantly following an excessive pessimism shock than to an excessive optimism shock and his results were in line with (Chen et al ,2013:14) who express how investors overweight the bad news and underweight the good news.

(Brown and Cli_ 2005) prove that there is a negative relationship between investors sentiment and the expected returns, In another word if the investor sentiment is low or high it will result to a lower or higher return, and he also shows how small companies are less affected by sentiments than larger companies due it its high predictability power.

(Lemmon and Portniaguina 2006) They discover the relationship between stock returns and investors biases by considering the confidence index as a measure for optimistic investors. And they discuss it from a rational and irrational point of view, and they found a negative relationship between investor's biases and stock market return even when mispricing is corrected by noise traders.

(Adem Atmaz and Suleyman Basak: 2018**)** They create a behavioral model for measuring different types of investors, and they test their biases effect on the trading volume , the return , and also on the volatility of prices , and they found that the mean return decreases

when investors are behaving in an optimistic way , while it increases when they behave in a pessimistic way .

(Yosef Bonaparte and Alok Kumar and Jeremy K. 2012) Discuses and prove by survey study how people's optimism for financial markets and the macroeconomic is influenced by their political beliefs, they found that Individuals are more optimistic and expect the markets to be less risky and more undervalued when their own parties are in power.

(Puri and Robinson:2007) prove that optimistic individuals take more financial risks and more likely to participate in financial markets and make grater transactions than normal investors. (Zygadlo , szpulak , szyszka :2014) they test the relationship between the optimism index of Thomson and Reuters market psych index which scan the media for relevant news that reflect mods an emerging country, and they found a positive relationship of optimism index opinions and the other factor is returned at the aggregate market level, the study was applied for 8 emerging countries and they found a positive relationship of investor's optimism bias and the return.

(Chiara cocetto and Francesco revazzolo:2019) point out that optimism leads to mispricing, lower returns than the expected one. (Baker& wurgler:2005) found that the issue at mispricing derives from a uniformed sentimental demand shock. (Brown and cliff :2005) found out that future returns are negatively related to investor's sentiment, when investor's sentiment is high it will imply a lower return and vice versa. (Mahlna, Mature and Memba:2017) they found a positive relationship of optimism and investment decision making in Kenya stock exchange.

People are unrealistic optimism they believe that good things is more likely to happen than bad things (weintein:1980), Optimism bias can be translated into microeconomic and macroeconomic activities, such as an optimism bias that influence managers when taking mergers decisions, or either startup companies, of other financial decisions, several studies have been conducted for testing the optimism biases of the startup's decision-makers, and the results were 86% of them were absolutely optimism about their successes, while only 50%, in reality, succeed within the 3 years of stating the work (shefrin book 2005).

(Glkhar & Divya :2019) he applied a structured questioner on 117 respondents in India, the questions were about optimism biases, demographic variables, investment choices, and he found that optimism bias is influenced by material statute, nature of employment, and work experience of Indian investors. (Bonoprate, Kumar :2012) They tested the optimism behavior of people towards financial markets taking into account the political conditions and the findings were when people feel that their own parties are in power so they will believe that markets are less risky and they take optimism decision, this study has been applied by using huge survey data set on the U.S market.

(SI Chen:2013) they point out that the pessimism behavior among individual's investors depends on the absolutely chance of profit, in another word pessimistic investors do not trade if they don't have absolute information that certain their profit chance, they fear from uncertain information and they count it as a risk to avoid.

2.3 Rational Expectations

The idea of using expectations in economic models was first proposed by john Maynard Keynes in 1930s, in the term of *''waves of optimism and pessimism''*

The theory of rational expectation was first found by John F. Muth 1961 in his paper rational expectation and the theory of price movement, In which he mentioned that investors are rational on average, and they contribute partly by their expectations in the future price, this idea was also in line with the famous quote for Abdurrahman Lincoln when he explain about an idea of the ability of calling part of the people are crazy all of the time and all the people are crazy part of the time , while the impossibility to say all the people are crazy all the time. The rational expectation theory is in contract with the government contribution in decision making because it suggests that the current expectations of investors of what will happen are the main factors in creating the outcomes. And those expectations are supported by three main factors that are; the rationality of humans, their and other's past experiences, and the information available.

There are several assumptions under this theory, that say individuals are always seeking to maximize their utility and thus their wealth or profit, and to do so they use their abilities to build up rational dissections, in addition, they use all the available information that could

affect the prices, and learn from their past experience and other past events, they might take wrong decisions in some of the time but not all of the time, and thus on average they make rational expectations, their rational expectations are the best method to make the future outcomes which have to be close to the market equilibrium.

The rational expectation theory is the main block that was used to contribute with the EMH by (Fama 1971), in which he mentioned that investors are rational they build their decision according to the all available information that reflects the future prices, and no one can beat or gain abnormal returns by trading information see EMH, and Degrees of efficiency, and the Muth theory help with the EMH assumptions more specifically when it explains the random walk of stock prices in efficient markets. Where the daily stock prices follow a random walk if the current price values conflict with the best expectations of the future price.

Lucas assumptions in 1978 of the rational expectations that were in line with Fama EMH , prices fully reflect all available and relevant information, and the current expectation of prices that drive consumer behavior is the main factor of future prices.

However, the EMH couldn't explain, market anomalies, and bubbles, and so those standard theories started to have questions and more and more empirical tests, and by time in the early of 1980s, they started to be developed by behavioral finance models and theories, in which the real world exists.

The most famous studies for rejecting the rational expectation theory was for (Shiller:1987, Poterba and summers:1987),Fama French :1988 , and west:1988) , all of these studies agreed on the fact that rational expectations theory itself doesn't fit the real world. However, they suggest more empirical testing over time to have a real explanation. In 1989 (Gregory C.Chow :1989) found that together the rational expectation and the adaptive expectation are accepted, the adaptive expectation is mainly about past performance predict the future performance.

Another study (Fama French :1993, Shifter and Vishy :1994, and levellen :1997), agreed on the fact that variation in expected returns might be weather from rational changes in the financial market environment or from the mispricing of the stocks.(Robien redwood and

Andri shlefier :2014) , they made a test for the rational expectation by using time series survey data for the period of 1963 to 2011 from six large survey sources in the US, that is the Robert's Shiller's investors survey, American association of individuals investors surveys, investors inelegance survey, graham harry chief financial survey . all of these six measurements are positively related with each other and with the market level, negatively related with the rational expectation model in predicting returns.

Three other studies for Dahoui in the early 2000s has rejected the rational expectation theory for predicting stock returns and explaining the growth of trading volume in both high volatility periods during the global financial crisis and in the stable period before the event of the global financial crisis, the tested stock markets were in Malaysia, the U.S, UK ,Soul Hong Kong, France, soul, and Switzerland, (Operan,et al:2015) has done the test using the same model of Dahoui on the Romanian and Brazilian market and the results were also rejecting the rational expectations of investors, the last model was also used by (Glanaidis: 2015) (Portugal, Italy, Ireland, Greece, Spain) in which he also reject the rational expectation theory.

2.4 Investor's behavioral biases and the trading volume

The influence of investor's behavioral biases on the trading volume can be measured and tested by several methods, experiments, survey, and by empirically by using proxies for investor's biases that is mainly derivate from the returns changes and its effect on the trading volume. and hence the most important link for understanding investor's behavior in the stock market, is the link between the return and the trading volume, in my paper, I rely completely on a model that uses this link for measuring investor's biases effect on the trading volume. and the relation between trading volume and the return has been observed by a large number of papers, such as (Rutedge:1984) he found a positive relationship between daily changes of returns and the trading volume in the American market.

(Gevas , Kaniel , Mingel 2001) , investigate the relation between trading volume and the direction of price movement, through the information interrupted in the prices, and they found large (small) trading volume will result in larger (smaller) returns.

The studies that used the relation of return and trading volume to test the behavior of investor's on the trading volume are the ones for Dahoui in 2014, depending on a model that measure the excessive optimism and excessive pessimism and overconfidence biases regarding the previous noticeable return, and he tested the effect of those biases on the trading volume, and the finding was a positive and significant effect on the trading volume by optimism investors found in the Japanese American and Swiss markets, and a negative and significant effect on the trading volume by pessimistic investors in the American , Swiss and French markets, and the overconfidence investors are positively effecting the trading volume in the Japanese market. Another study for (Operan et al: 2015), testing the effect of excessive pessimism and excessive optimism behavior of investors on the trading volume on the Romanian and Brazilian markets and she found that the pessimism behavior has the greatest negative influence on the trading volume in Romania, and the pessimism behavior has the positive influence n the trading volume in the Brazilian market, A and a third study by (Iordanis Galanidis:2015), on the PIIGS countries , for the period of 2010-2014 using the same model as (Dahoui:2014), he found that the pessimism bias influence negatively the regarding volume in Italy and Ireland, portages investors are positively effecting the trading volume with overconfidence bias m in only in Spain and Greece the pessimistic investors has a positive influence on the trading volume.

Several studies also tested the effect of investor's behavioral biases on the trading volume by using other methodologies rather than the return trading volume relation. such as the one for (Glaser and Weber 2003), they tested the effect of overconfidence bias on the trading volume by using a theoretical model through conducting a survey for investors and brokers in the Spanish market, and they got 215 respond and the results were for investors who think they are better than average they tend to trade more.

(Zaine et al: 2006), they used the Vector Autoregressive model VAR, for testing the relation of increased return on the trading volume, and this model is built on investor's who earn larger returns became more overconfidence, and the found evidence for the overconfidence hypothesis in several emerging markets.

(Concetto and Ravazol 2019), investigate how investor's sentiment can predict the returns and they tested the sentiment indices ability to predict future return, and they found that in the American market these indices have the ability to predict of return unlike the case of EU.

(Germain , Rousseau , Vanhems :2006) analyze the consequences of optimism and pessimism on financial markets. They create a general model of unrealistic informed traders and realistic informed traders, with risky assets, in an active competitive market, they found that when investors are realistic, optimism investors buy more or sell few amounts while pessimistic investors sell more and buy less, and the opposite case when they are unrealistic investors.

3. BRICS & G7 STOCK MARKETS.

This section reviews the economical, historical and financial background of both conducted groups, G7 and BRICS, and the role they play in financial markets, pointing out the noticeable growth of BRICS countries and the rise of BRICS stock markets, being an alternative opportunity for international investments, with supportive financial and economical facts of BRICS and G7 stock markets during the last recent years.

3.1 Advanced economy globally and the rise of BRICS.

The world faced lots of economic challenges in the last 50 years, starting from the oil crises in 1973 which were the main reason of creating G6 group of the main industrial countries ; Japan , France , Germany , Italy , the United states , United kingdom, and in the end of 1976 Canada joined the group to make the G7 group being the most economical political and leader power in the world, Russia was included in the group in 1998 and after it left the G8 group in 2014 due to the event of annexation of Crimea by the Russian Federation.

In 1981 the economist Antoine Van created the concept of emerging countries after these counties were known as less developed counties, and emerging countries have some of the characteristics of G7 group but don't fully fit the same financial and economical levels of G7, In 1999 the group of G20 countries was found as a response to the Asian crisis in 1996,

and the main task of G20 group members was to provide financial stability of the new world of globalization period which was started in the early 90's period.

In 2001 Jim O´Neill introduced the concept of BRICs counties, and the real establishment of this group occurred in a summit in Russia in 2009 as a response to the global financial crisis, and later on in 2010 south Africa joined the group to became as BRICS, because the global financial crisis proved that only the developed countries G7 group , is not able to solve such a global crisis, and this crisis also shows how financial markets are separate by being effective of crisis even in a globalized world, and thus the crisis also point out the importance of creating emerging group that are also meant to help and support the global financial world during the crisis period.

During the recent years, BRICS countries that are considered as emerging economies recorded a faster growth of GDP compared to developed economies G7 countries, and this growth drove to an increase in their share of world GDP of international trade, international financial markets, and international foreign direct investment. The idea of predicting BRICs countries to have a healthier economic outlook compared to G7 countries was first proposed by James O'Neil at Goldman Sachs in. He stressed the fact of BRICs four economic countries excluding Africa, which will contribute to a higher percentage of the world share of GDP Wight, and this group will be an economical powerful power and even treating the G7 group on the international financial levels. And by the time the prediction of this author became totally right and the group of BRICS countries now is playing a key role in the world economy, especially china with the second-largest economy in the world adding its Wight to the BRICS group to be an economic and political powerful power in the global world.

	GDP at Current price*					**GDP based on ppp***				
	2015	**2016**	**2017**	**2018**	**2019**	**2015**	**2016**	**2017**	**2018**	**2019**
G7	34,734	35,672	36,904	38,921	39,631	36,512	37,435	39,018	40,783	42,169

BRICS	16,681	16,889	18,924	20,590	21,120	35,513	37,818	40,788	44,137	47,121
EU	16,474	16,575	17,371	18,777	18,410	19,535	20,154	21,096	22,077	22,823
world	74,642	75,847	80,602	85,678	87,067	115,994	121,085	128,042	135,757	142,228

Compression of GDP size among G7 and BRICS countries, Based on PPP and Current prices. Table-1: Global view of GDP size at current price and PPP.

*Data Source: IMF & the WRLD BANK * Values are billions in USD.*

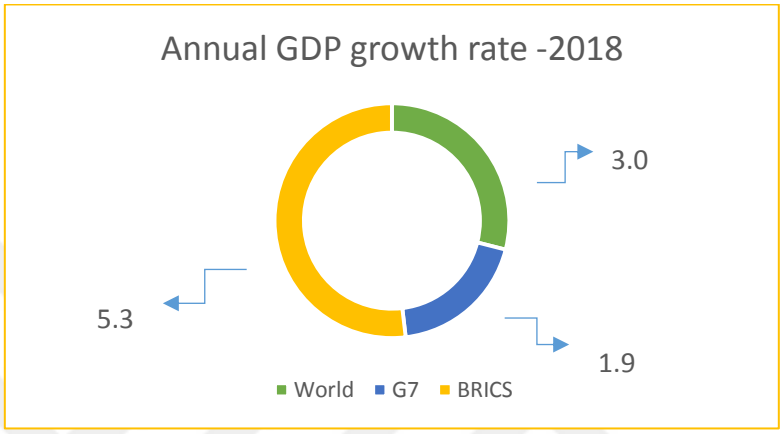
The economies of the emerging countries experienced exceptional growth in the 2000s, leading among emerging countries is the BRICS group Brazil Russia India china and south Africa , economists believe that these countries will dominate the world economy and threat the existence of advanced economies more specifically the G7 group .The BRICS countries shows a quick survive after the global financial crisis in 2008 , which made these countries as a global attractive and noticeable power on the international level . BRICS are also playing a key role in the global world by being the main reason of the changes in the architecture of the global development corporation, this group is promoting for helping and supporting the other week nation for providing and achieving higher levels of international stabilities all around the world, they became an alternative and more trustable destination for international investors and companies in a globalized world. the relevance of BRICS group is related for many factors, one of these factors is the size of their economies, BRICS also recorded strong growth rates of GDP, see figure 1, in addition BRICS group is representing a strong political power in the international governance structure, mainly because of their strong economic power (Orgar et al 2011) .

In the table 1 above, we made a comparison between G7 and BRICS countries taking a global view on the both GDP value, based on current price, and on PPP level.

Depending on PPP of GDP size the BRICS countries are larger economies than the European union group which contain 22 nations, and even larger than the G7 group of developed countries depending on the GDP based on PPP. china alone is the largest and top

country by GDP based on PPP in the world, holding 27,308 billion USD, which represent 19.30% share of the world's GDP based on PPP in 219 (IMF 2019).

Figure 1 - Comparison of Annual GDP growth rate globally (Annual average %) end of 2018.



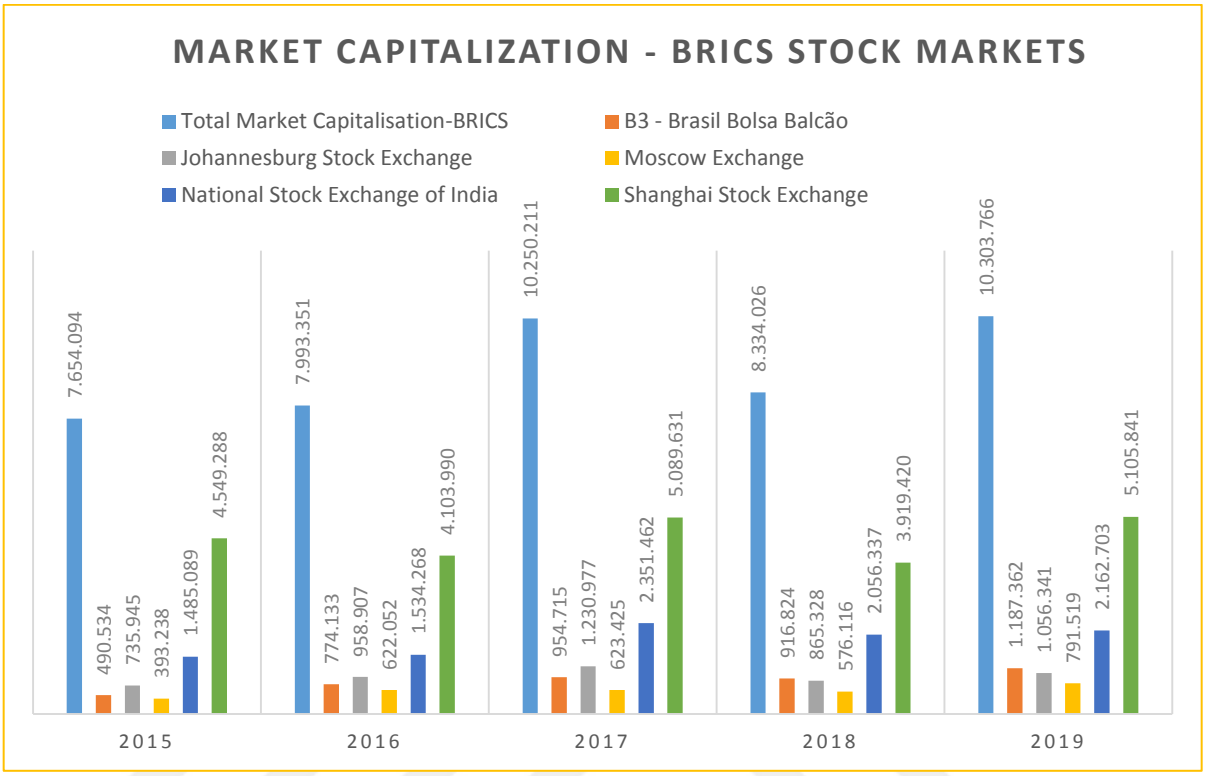
Data Source:(UNCTAD 2018)

China and India recorded the highest repaid level of GDP growth rates among G7 and BRICS countries, 5.12% growth rate for china, and 6.11% for India, end of 2019 (UNCTAD 2019). Figure 1 is picturing a global image of the BRICS percentage of annual GDP growth rate, and as we can notice the percentage of annual GDP growth rate recorded 5.39 for the BRICS group in end of 2018, which exceed the growth rate for G7 group, and even the GDP growth rate of the whole world.

3.2 The BRICS stock markets.

The BRICS stock markets has improved significantly after the 1990s with the increasing trends in globalization period, and these stock markets has become an alternative option for international traders, since the study is focusing on the behavior of investors while making investment decision in G7 and BRICS countries, we should first make a quick review of each stock market, and provide a cross-country comparison using commonly used measures of determining the level of development of each stock market.

Figure 2 – Market capitalization of BRICS stock markets.



Data source: The World Bank & the WFE.

The Brazilian stock exchange market ‘’ São Paulo stock exchange ‘’ is founded in 1890 by Emilio Rangel Pestana , **IBOVESPA** is the main market index of this market including the largest companies by both market cap and traded volume , this index is being used since 1968. The market capitalization of a stock market is one of the most importantly used measures of the financial market development level, which is calculated by the share price times the numbers of shares outstanding. As we can notice from figure 2 the Brazilian stock exchange market shows a significant growing during the period of 2015-2019, in five years it approximately recorded the double amount of market capitalization, the value Brazilian stock exchange has increased from 490 billion USD in 2015 to 1 trillion USD in 2019. the average amount of the market cap among BRICS stock markets in 2019 is 2,060,753 trillion USD, and the Brazilian market is still below the average value of BRICS market cap in end of 2019. The Brazilian stock exchange recorded the third market largest market in BRICS countries after china and India, regarding Market cap measure, with 11% share of total BRICS market capitalization in 2019.

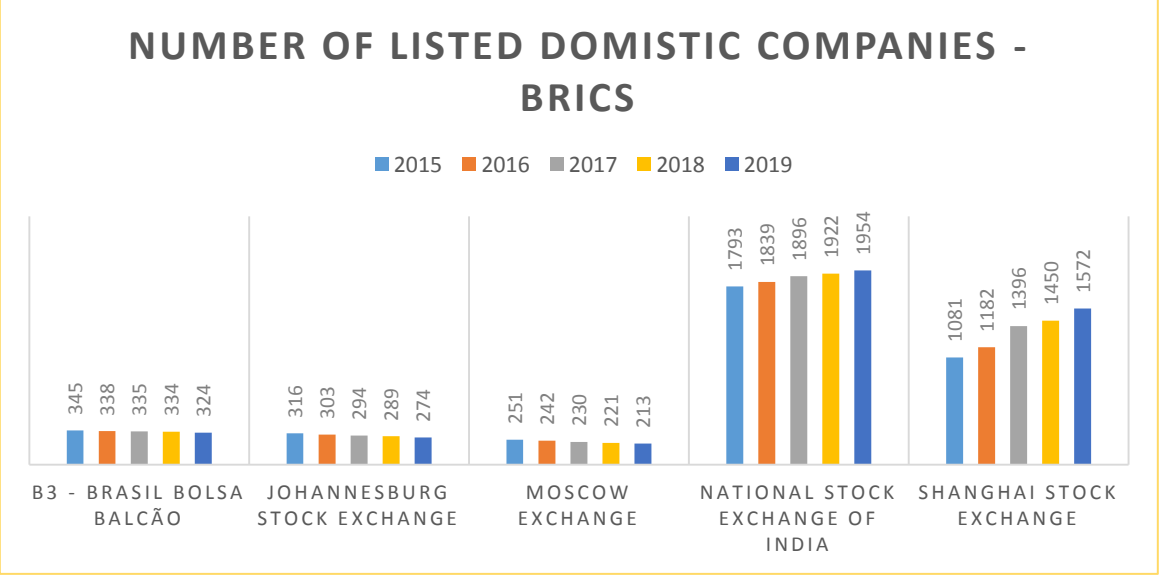
The Russian stock exchange market ‘’Mosco Exchange’’ founded in 2011 by merging two largest Moscow-based exchanges that are the Moscow Interbank Currency Exchange (MICEX) , and the Russian Trading System (RTS), the main market index for this market is MOEX index , the number of companies included in this benchmark varies according to the liquidity and the number of trading volume of the companies , this index is preferred by domestic investors , while foreign investors prefers RTS index , which is a free float capitalization weighted market index of 50 index traded in Mosco exchange market , in our analysis we chose the MOEX index since we want to analysis the behavioral characteristics of investors in each studied market . the market capitalization of Russian stock market has been increased during the last five years, from approximately 393 billion USD to reach 791 billion USD in 2019, see figure 2 however this amount is still the lowest one comparing to the other markets in BRICS group, with a contribution of 8% share of total BRICS market capitalization which is recorded as 10,303 trillion in the end of 2019. (world federation of exchange 2019).

The national stock exchange of India is the largest stock exchange in India founded in 1992 as the first electronic exchange in the country, and in 2018 ranked as the 11th largest market in the world, the main market index of this stock exchange market is NIFTY 50 including the average weighted of 50 company stocks in 17 sector , the market capitalization of the Indian stock exchange has been increased during the last five years form 1,485 trillion USD in 2015 to reach 2,162 trillion USD in 2019. The market capitalization of this market is above the average amount of the total market capitalization of BRICS countries in 2019, and thus this market is the second largest market among BRICS, with a contribution of 21% share of total BRICS total equity market capitalization.

Shanghai stock exchange is one of the two stock exchanges operating in china, founded in 1990, and in 2018 it recorded the 4th largest market in the world by market cap, the main market index of this stock market is SSE composite of all shares traded in SSE for both types A, and B, A share type refers to domestic shares traded by local currencies, and B type for the foreign shares traded by other currencies. The Chinese stock exchange market is the top stock exchange market by market cap among the group of BRICS stock market, with a contribution of 50% share of total market capitalization recorded in end of 2019.

South African stock exchange market is known as Johannesburg stock exchange which is the largest stock exchange in Africa, founded in 1887, the main market index of this stock exchange market is FTSE/JSE, consist of top 40 companies traded in the JSE stock market, this stock market is the fourth one among BRICS countries, largest than the Russian stock market by market cap, with a contribution of 10% share of total market cap among BRICS stock exchange markets. The JSE stock market's cap has been slightly increased during the last five years from approximately 735 billion USD in 2015 to reach 1 trillion USD in 2019. Notice figure 2.

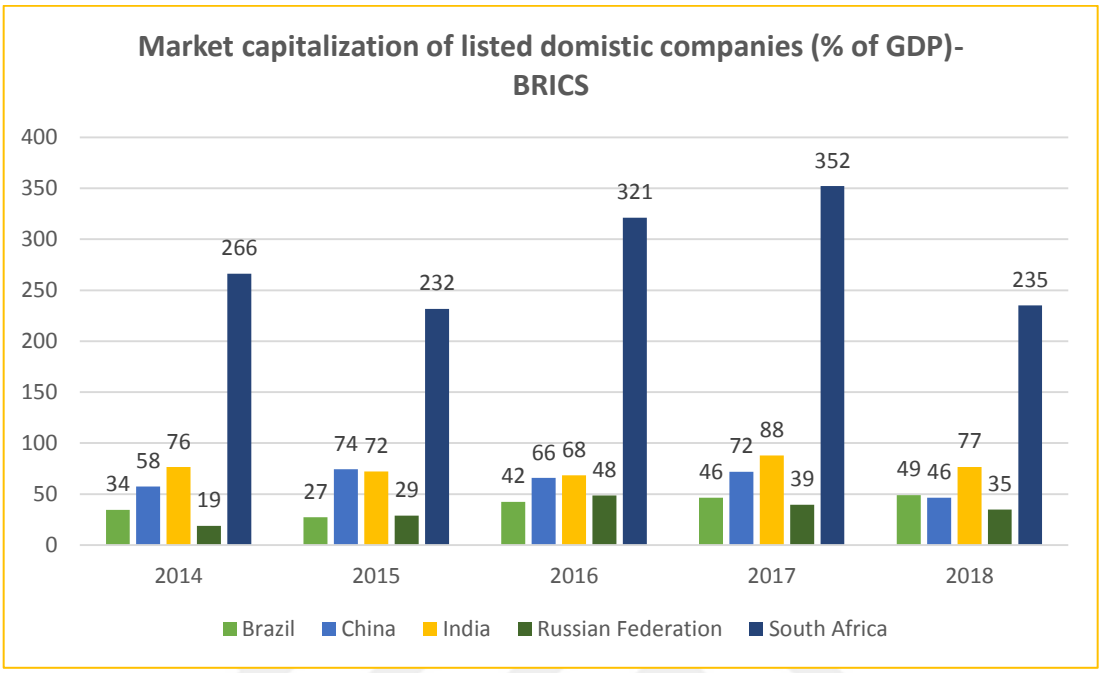
Figure 3 – Number of listed domestic companies in BRICS stock markets.



Data source: The World Bank & the WFE.

The number of listed domestic companies in a stock market, is another indicator of measuring the size of the market, bellow, for the figure 3 we can notice that the Indian stock exchange and the Chinese exchange markets are the top two markets among BRICS stock exchange markets by the number of listed domestic companies. the rest of the markets falls below the average number of total listed domestic companies in the whole BRICS group which is 476 companies in 2019. The Indian and Chinese stock exchange markets are only smaller by size according to the number of listed domestic companies than the Japanese and the Canadian and American stock exchange markets, and larger than the rest of the markets involved in the G7 group.

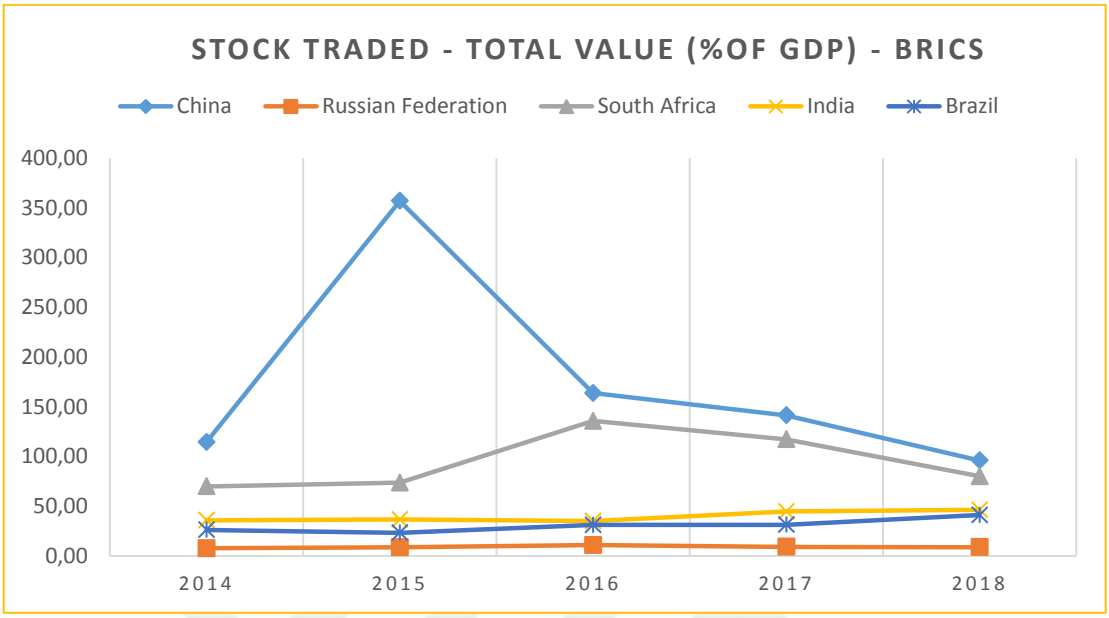
Figure 4- Market capitalization of listed domestic companies % of GDP in BRICS stock markets.



Data source: WFE.

The stock market capitalization to GDP ratio, is not only a measure of the level of development of the market, it's also used to determine the valuation of the markets, whether the overall of the market is undervalued, overvalued, or fair valued, and it's calculated as; stock market capitalization divided by GDP multiplied by 100, this indicator is also known by ''Buffet indicator'', the market is said to be fair valued if the ratio falls between 75% and 90% and overvalued if it's above 90%. Form the figure 4 we can observe that in the end of 2018 the Indian stock exchange market is fair valued, and the south African market is overvalued market, and the rest of the markets are undervalued.

Figure 5- Total value of stock traded in BRICS as a % of GDP



Source: The World Bank database.

Stock traded % of GDP refers to the total value of stocks traded within a market during a specific period of time, this indicator is complement to the market capitalization ratio, by showing whether the size of the market is matched by trading values or not (world bank 2013), it has been also used also for measuring the market depth, in terms of liquidity or the easiness of trading shares (Nihal Bayraktar 2014). From the figure 5 we can notice that the top market according to total stock traded ratio % of GDP, is china, recording the higher value of stock traded ratio during the last five years comparing to the rest of BRICS group , and reaching the highest percentage in the year of 2015 with 357% of stocks traded value % of GDP , and during the period of 2016-2017-2018 the Chinese market recorded lower values of stock traded percentage , the second top market among BRICS group is the south African market recording 135% in the year of 2016 , and during the period of 2016-2017-2018 the market was following the Chinese slightly percentage decreasing to record the 90% in the end of 2018 , the rest of BRICS markets which are Russian , Brazilin , and Indian , markets , were all below the 50% of total stock traded value ratio , this might be an indicator for lack of liquidity or difficulties of trading transaction processes in those three countries , and the smallest market by depth among BRICS markets is the Russian market recording it's highest ratio in 2016 which is only 10% of total value traded .

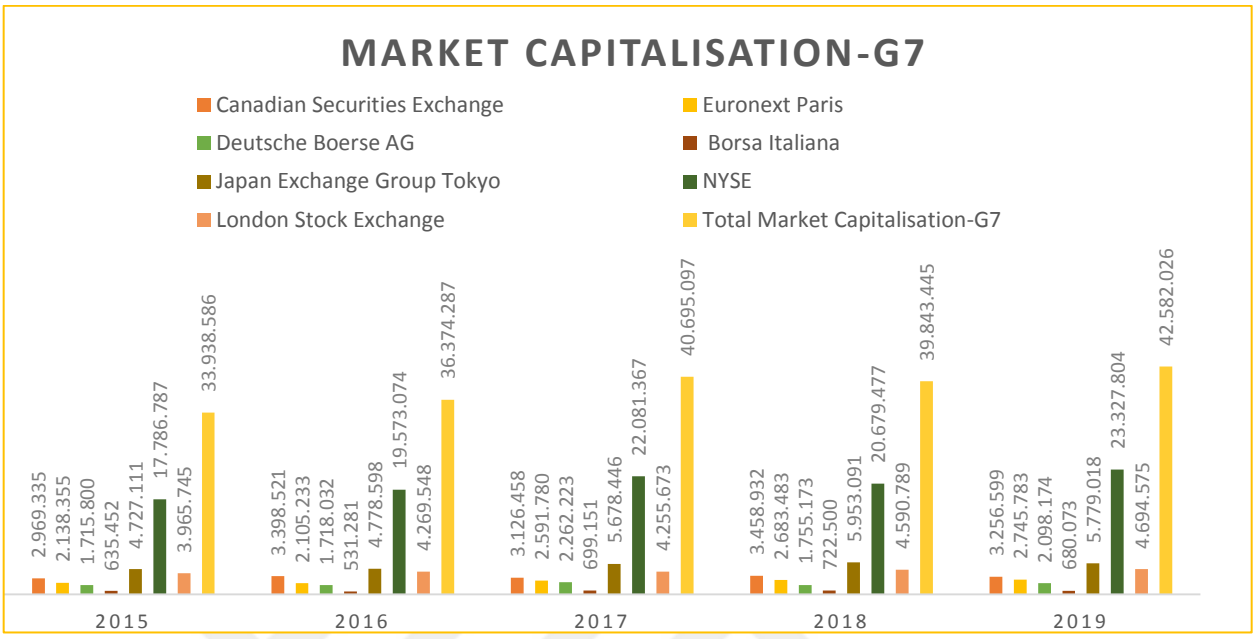
3.3 The G7 stock markets.

The group of G7 is an international intergovernmental economic organization founded in 1973 IMF, and the main role for this organization is to manage the monetary policy through financial stability form, this group is consisting of 7 developed economies, Those countries have the most effective power and voice in the political, economic, financial, decisions all around the world, in another word, they dominate the world by their power, in the end of 2018, the G7 group represent 58% of net global wealth approximately 317 trillion USD (IMF 2018).

The group of G7 has another real competitive group which is the BRICS group, which has been threaten the existence role of G7 group by dominating the world during the last twenty years, see figure 1 and you can notice that the G7 group contributed only by 1.99% of global GDP growth, while the BRICS group contribution was recorded as 5.39% in end of 2018, (world federation of exchange 2019). by looking on the table 1, in the 2019 period and Comparing the GDP based on Current price, the G7 countries hold 45.5% share of total world of GDP while BRICS countries hold 24.2% of the world total GDP based on current price. However, the seven countries involved in G7 group represent 29.6% of the world GDP based on PPP, while the BRICS countries represent 33% of the world Total GDP based on PPP.

The international stock markets in G7 group had been improved rapidly during the last four decades, for many reasons including the globalization, the internationalizing, and the liberalization events, In the following parts, there will a brief explanation of each stock market of each country in the group of G7, in addition to general comparison to the BRICS stock markets group.

Figure 6 – Market capitalization of G7 stock markets.



Data source: The World Bank and WFE.

Toronto stock exchange , is the 9th largest stock exchange by market cap , founded in 1861 , the main market index of the Toronto stock exchange market is S&P/TSX Composite Index which represent 70% of total market cap of the Canadian stock exchange, which recorded approximately stable performance during last five years see figure 6 , the Toronto stock exchange recorded 3.556 Trillion USD in 2019 , which is still below the average of the G7 market cap which is 5.9 trillion USD , the Canadian stock exchange recorded a contribution of 8% of total market cap in G7 group. Being the 4th ranked stock market by market cap among G7 group, however the Canadian market is still larger by market cap than all BRICS stock markets except the Chinese one in 2019.

The Euronext Paris known as Paris Bourse founded in 1724 , this stock exchange has been merged with the Amsterdam, Lisbon, and Brussels exchanges in September 2000 to form Euronext , which is the second largest exchange in Europe after the United Kingdom's Group. The main market index for Euronext Pairs is CAC_40 which tracks the top 40 companies by market capitalization Wight. The Euronext Paris stock exchange market recorded 2.745 Trillion of market cap in 2019 this amount is below the average of G7 market capitalization value, the contribution of Euronext pairs is 6% share of total G7 market capitalization which exceed the value of 41.072 trillion in the end of 2019.

Deutsche Bourse in Germany founded in 1992, the main market index is DAX_30 which tracks the top 30 companies by their financial performance in the market, this stock market recoded the highest value of market capitalization during the last five years in 2019 which is approximately 2 Trillion USD, with a contribution of 5% in total market cap of G7 group

Bursa Italian, is the only stock exchange market in Italy, founded in 1808, this market is the smallest market by market capitalization, recording 680 billion USD end of 2019, the Italian stock market as similar to the Russian stock exchange market by the market capitalization value, this market is even smallest than the rest of BRICS stock markets, with a contribution of only 2% of total market capitalization of the group of G7. The main market index of Bursa Italian is FTSE MIB, which consist of the most 40 stocks traded in the Italian exchange.

The Japanese stock market is the third largest market in the world after NASDAC and NYSE, with a market cap of 5.779 Trillion USD, founded in 1878, the main market index of this market is Nikkei 225, which measure the performance of 225 traded stocks in different sectors, the contribution of the Japanese stock exchange market in market cap among G7 total market capitalization is 13%.

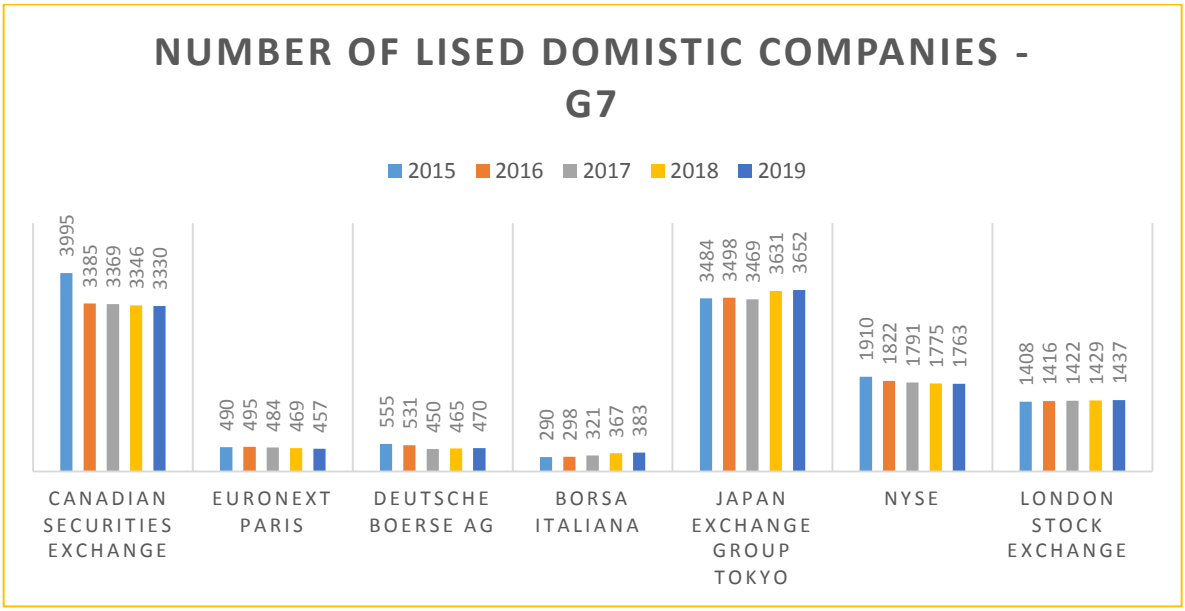
London exchange market, founded in 1571 being one of the oldest exchange markets in the world, the market recorded an amount of 4.56 trillion USD of market capitalization, being the third largest stock exchange market in the G7 group with a contribution of 11% of total market cap of G7 stock exchange markets, the main index of this exchange market is FTSE 100 which is consist of 100 top largest qualify companies by full market value.

New York stock exchange, founded in 1792 It's the world largest stock exchange by market capitalization of 23 trillion USD in the end of 2019, it contributes with 55% of total market capitalization in G7 Group, 3 main stock indices are used in this market that are NYSE composite, Dow jones industrial average, and the S&P index which we choose in our analysis, this index is tracking 500 largest companies with top financial performance in the NYSE.

Please not that in the study we have exclude two extra stock exchange markets that are Hong Kong which is the fifth largest stock exchange market in the world by market cap

with value of 4.31 trillion USD, and the NASDAQ stock exchange market which is the second largest stock exchange market by market gap 11.2 trillion USD globally, for a specific reason which is we wanted to focus specifically on the stock exchange markets from where we choose the main indexes to be tested in the empirical test part.

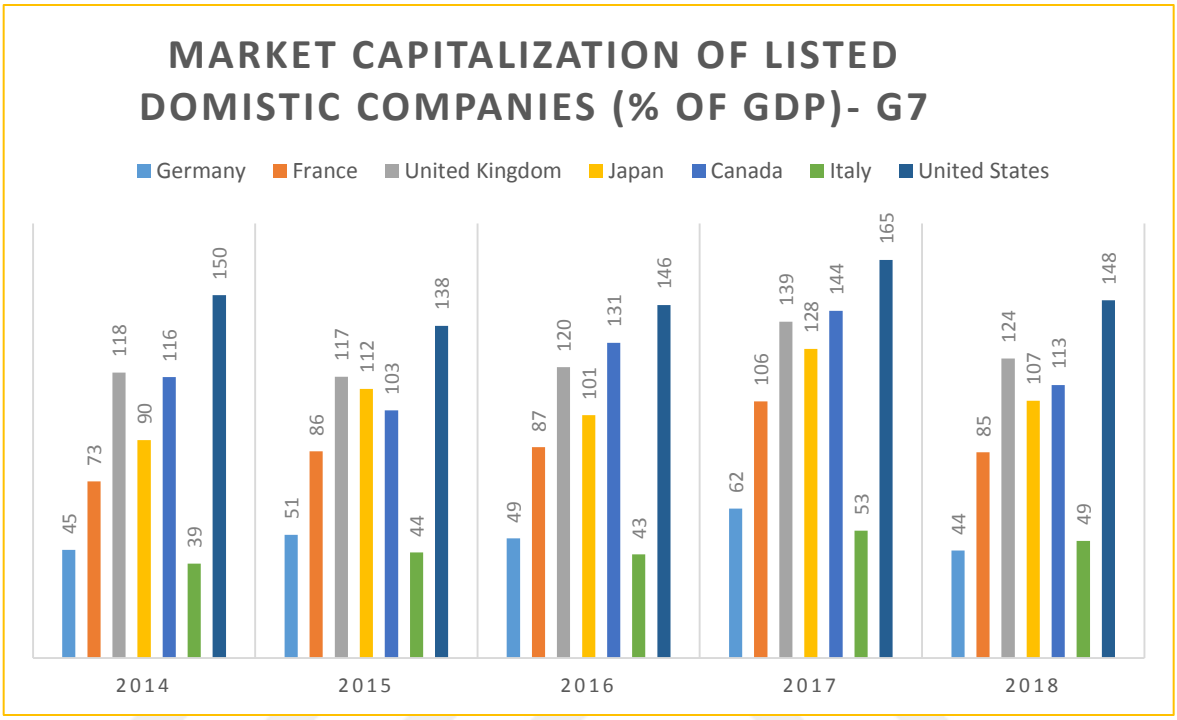
Figure 7 – Number of listed domestic companies in G7 stock markets.



Data source: The World Bank and WFE.

As we mentioned above the number of listed domestic companies in stock exchange is used as an indicator for measuring the size of the market, from figure 7 we can notice that the Japanese stock exchange market is the largest market among G7 stock exchanges by number of listed domestic companies, the second one is the Canadian market. and the third largest one is NYSE market, the average number of listed domestic companies among the seven markets bellow is approximately 1641 in 2019, and the rest of the stock exchange markets falls below the average number.

Figure 8 – Market capitalization of listed domestic companies as a % of GDP .

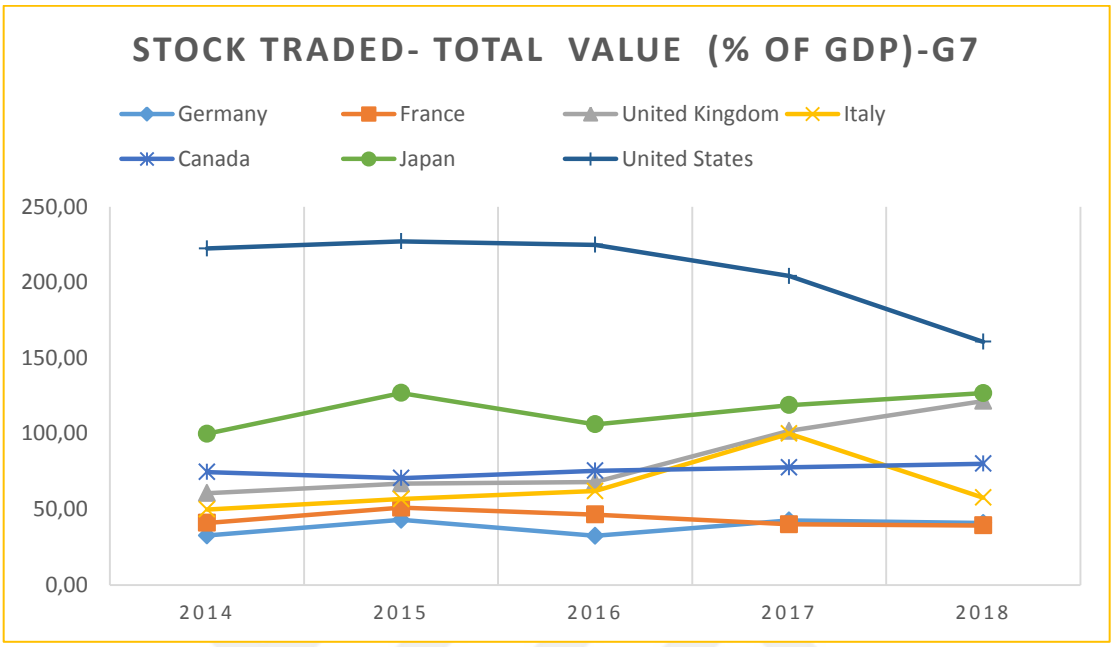


Data source World federation of exchanges.

As for BRICS group, the market capitalization to GDP ratio is used for valuation the stock market, depending on this indicator ‘’Buffet indicator’’ the market is said to be fair valued if the ratio falls between 75% and 90% and overvalued if it’s above 90%. And depending on this indicator by looking at figure 8 in the end of 2018 which is the latest data available, we can notice the only fair market value is the French market among G7 group with a percentage of 85% market cap to GPD, Italian and German stock markets are undervalued with a percentage below 70%, the rest of G7 group stock markets that are British, Japanese, Canadian, and American markets, are overvalued market with a ratio of market cap to GDP above the 90%. and among BRICS and G7 stock exchange markets, the only two fair valued stock exchange markets depending on Buffet indicator, are French and Indian stock markets.

Note; *for making the statistical analysis accurate we have included the Hong Kong stock exchange and the Nasdaq stock exchange markets*.

Figure 9 Total value of stock traded as a % of GDP in G7 stock markets.



Data source: The World Bank database.

The Stock traded to GDP ratio, is a complement measure to the market capitalization ratio, by showing whether the size of the market is matched by trading values, it is also used for measuring the market depth, in terms of liquidity or the easiness of trading shares (Bayraktar 2014), and from the figure 9 we can notice that the united states has recorded the highest value of stock value traded to GDP ratio among the group of G7 group during the last five years , and the highest amount value was 227% in the end of 2015, and recorded 160% in the end of 2019 this means that American stock exchange markets are matching it's huge size by high number of trading values , it also might be an indicator of high percent of liquidity and ease of trading transaction in the American stock exchanges , the second stock exchange market by stock traded value to GDP ratio is the Japanese stock market with its highest value of stock traded to GDP ratio equal to 126% recorded in 2015 and it reach the 126% again in end of 2018 after small percent of decreasing in 2016 , the rest of the countries are below 100% except the British and the Italian market in the recent two years , the British stock market reaches the value of 100% in 2017 , and the value of 121% in 2018 , while the Italian market reaches the value of 100% only in the end of 2017 , and continue to decrease again in 2018 . those market that fall below the average value,

might have some problems in liquidity, or they either might have difficulties in trading transactions.

among G7 and BRICS stock exchange markets, the top four markets that recorded high percent of stock value traded to GDP ratio, are the Chinese, south African, American and Japanese market, those market are matching their huge size with the trading values and they have high percentage of liquidity and ease of trading transaction, comparing to other markets with low percentage of stock traded value to GPD ratio

4. REASERCH DATA AND METHODLOGY

This section explains the data sources, the sample period and the methodology used, in addition to the mathematical steps of computing each of the variables in the analysis and the final linear regression model.

4.1 Sample period and data collection

The sample contains twelve market's indices for G7 countries (Canada France Germany Italy Japan United Kingdom and the united states) and BRICS countries (Brazil, Russia, India, China, and South Africa).

The main market indices for each of the countries are included for the period of five years from 01.01.2015 to 01.01.2020. (S&P/TSX for the Canadian market, CAC_40 for the French market, DAX for the German market, FTSE MIB for the Italian market, NKKEI 225 for the Japanese market, S&P 500 for the American market, FTSE 100 for the British market, IBOVESPA for the Brazilian market, MOEX for the Russian market, NIFTY 50 for the Indian market, SSEC for the Chinese market, and FTSE/JSE for the South African market.)

The historical data are collected mainly from Bloomberg and Yahoo Finance. After eliminating the non-trading days for each market our sample includes 1253 observations for the Canadian market, 1277 observations for the French market, 1266 for the German market, 1268 for the Italian market, 1238 for the Japanese market, 1257 for the American market, 1263 for the British market, 1242 for the Brazilian market, 1247 for the Russian market, 1229 for the Indian market, 1218 for the Chinese market and 1247 for the South African market.

4.2 Econometric methodology

The study aims to test the behavioral factors that may explain the trading volume fluctuations in G7 and BRICS capital markets. The mathematical methods to test the physiological phenomena are presented in Table 1. The following sections briefly explain

the computational steps of the variables. Then we show the descriptive statistics, the stationarity tests and finally the linear regression analysis conducted by using E-views statistical program.

4.3 The variables

This section briefly explains the mathematical methods of computing each of the variables used in the analysis.

Table 2- Variable Descriptions

Variables	**Measurement method**	**Description**
Trading	*Log (daily time series data of trading volume each market index)*	Dependent variable(output)
Overconfidence	*If Rt-1 ≥ 0 → Transaction will occur ; Dummy variable value = 1* *If Rt-1 < 0 →Transaction will not occur ;Dummy variable value=0*	Independent variable (input)
Excessive optimism	*If Rt-1 ≥ $\bar{R}$+σ→ Transaction will occur ;Dummy variable value =1* *If Rt-1 <$\bar{R}$ +σ→Transaction will not occur; Dummy variable value =0*	Independent variable (input)
Excessive pessimism	*If Rt-1 ≥$\bar{R}$ - σ→Transaction will occur ;Dummy variable value = 1* *If Rt-1<$\bar{R}$ - σ→ Transaction will not occur ;Dummy variable value = 0*	Independent variable (input)
Rational expectations	*E(Rt) = Rt-1 + ε (t-1)*	Independent variable (input)
Residual	*Residual = Observed value – predicted value* *(automatically estimated as Constant)*	Represent the error term

Overconfidence

The proxy of conducting overconfidence has been used previously by (Khcherem & Bouri (2009). The relationship between the trading volume and overconfidence while taking into

consideration the effect of the previous return R_{t-1} and the current trading volume TV_{t+1} .If the return increased in the last period, investors respond overconfidently and increase their trading transactions. In this paper, we used Operan et al. (2015:7)'s model which explain overconfidence behavior by if security returns are positive including the value of zero, a transaction will occur, if the security return is negative then the transaction will not occur.

We created a dummy variable while conducting the regression model. When a transaction occurs the dummy variable recorded the value of one and the value of zero when the transaction fails to occur. As represented below:

If Rt-1 ≥ 0 → Transaction will occur ; Dummy variable value = 1

If $R_{t-1} < 0$ → Transaction will not occur ; Dummy variable value = 0

To calculate the return, we used natural log function for calculating index returns as explained in the following formula; $R_t = log\ (p_t / p_{t-1})$ while p_t is the stock market index price at time t, and p_{t-1} is the previous stock market index price.

Excessive optimism

According to Ackert & Deaves (2010:6) "Excessive optimism is present when people assign probabilities to favorable/unfavorable outcomes that are just too high/low given historical experience or reasoned analysis". To compute the excessively optimistic investor behavior we used Dhaoui (2011:5)'s method. When excessively optimistic investors reach a certain minimum level of profit they will actively increase their trading transaction and when the returns are lower than the minimum level, they will react or decide to cancel the trading transaction. To compute the values in the regression we created a dummy variable that recorded the value of zero when the transaction fails to occur and vice versa for the value of one when the transaction occurred. As described in the following;

If $R_{t-1} \geq \bar{R} + \sigma$ → Transaction will occur ; Dummy variable value = 1

If $R_{t-1} < \bar{R} + \sigma$ → Transaction will not occur ; Dummy variable value = 0

Excessive pessimism

Excessive pessimism occurs when investors reach a minimum level of loss on the previous day and limit their trading transactions. If the return is above that minimum level they will participate in the trading transaction. We created a dummy variable that recorded the value of 1 when the transaction occurred and the value of 0 when the transaction fall to occur, as described below ;

If $R_{t-1} \geq \bar{R} - \sigma \rightarrow$ ***Transaction will occur; Dummy variable value = 1***

If $R_{t-1} < \bar{R} - \sigma \rightarrow$ ***Transaction will not occur ; Dummy variable value = 0***

Rational expectations

Rational expectation theory that has been formulated by Muth (1961:23), in the line with the efficient market hypothesis (Fama,1970:13) suggest the investors are rational on average and even when they are irrational, randomly choices and arbitrage transactions cancel each other's, they depend on their last experiences and on the information available , the prices follow a random walk and investors rational decisions can lead the price to the equilibrium level , In our analysis we used Muth methods for computing the rational expectations of returns.

we determined the expected return of rational investors by taking into consideration:

1) The return that has been made on the previous date $\mathbf{R_{t-1}}$.
2) The residual factor is ε ***(t-1)*** which represent the error made in the time ***(t-1)*** is equal to the difference between the observed return in **(t-1)** and the expected return at the same time, as follows ε ***(t-1)*** $= R_t - R_{t-1}$

R_t is computed by ln (P_t /P_{t-1})

⇨ The expected return by rational investors will be represented by this equitation ;

$$E(Rt) = R_{t-1} + \varepsilon \text{ (t-1)}$$

4.4 The model

After computing the independent variables as mentioned above, and to test the impact of each independent variable on the dependent variable which is the trading volume, we computed the natural logarithm of the trading volume of each market index, and then we run the linear regression model for each market.

$$log(TV) = \beta_0 + \beta_1 Overconfidence + \beta_2 excessiveoptimism + \beta_3 excessivepessimism + \beta_4 rational\ expectations + \varepsilon_t$$

Where;

log(TV); the natural logarithm of the trading volume in time $_t$

Overconfidence; The return expected by overconfident investors in the time t, taking into account the gains they notice in time (t-1)

Excessive optimism; The return expected by optimistic investors in the time t considering available information in time $_{(t-1).}$

Excessive pessimism; The return expected by pessimistic investors in the time t, taking into account the available information in time $_{(t-1).}$

Rational expectations; The return that are expected by rational investors in the time t, taking into account the available information in time $_{(t-1).}$

ε_t: is the residual factor that represents the error term.

5. EMPIRICAL RESULTS

This section represents the empirical results of my study, it discusses the statistical results of the variables used, and it also shows the data stationary test in addition to the empirical final results of the analysis.

5.1 estimation results and dissection:

The results are ordered as follows the first table shows the descriptive statistics, second table for the data stationary tests and the last one represent the regression analysis results respectively in tables numbered; 3,4, and 5.

Table 3 presents the summary statistics of return and trading volume for twelve different capital markets tested in the analysis.

Table 3 - Summary statistics for return and trading volume

Market	Variables	Obs.	Mean	Max	Min	Sd	Skewness	Kurtosis
Canada	Returns	1253	0.000116	0.028963	-0.031745	0.006788	-0.343866	5.423345
	Trading volume	1251	19.13315	20.57115	16.84388	0.305681	-1.020344	12.11689
France	Returns	1277	0.00267	0.040604	-0.08344	0.01063	-0.563163	7.944651
	Trading volume	1276	18.33788	19.84566	16.3365	0.337822	-0.23042	5.13266
Germany	Returns	1266	0.000241	0.048521	-0.070673	0.011076	-0.401774	5.620112
	Trading volume	1266	18.31248	20.4814	16.12631	0.323511	0.523897	14.2876
Italy	Returns	1268	0.000162	0.056987	-0.133314	0.013646	-0.851468	11.59456
	Trading volume	1268	19.94157	20.72315	18.3063	0.478153	-1.120328	4.793565
Japan	Returns	1238	0.000263	10.33966	-10.34022	0.611485	0.133846	173.5094
	Trading volume	1228	11.54165	15.87793	9.655026	0.455255	1.221543	11.27781
UK	Returns	1263	0.000112	0.03515	-0.047795	0.008705	-0.216187	5.49532
	Trading volume	1263	20.8223	20.72323	18.42068	0.629792	-1.987751	5.488252

U.S	Returns	1257	0.00359	0.048403	-0.041843	0.00848	-0.524812	6.836647
	Trading volume	1257	21.9518	22.7526	20.98297	0.180398	-0.159476	7.078397
Brazil	Returns	1242	0.000702	0.442137	-0.446945	0.022909	-0.267542	229.6249
	Trading volume	1242	15.12609	16.21764	12.92781	0.30036	-0.478084	7.097713
Russia	Returns	1247	0.000521	6.12811	-6.137454	0.397706	1.931954	178.1674
	Trading volume	1247	20.096663	22.33759	17.9321	0.355432	-0.199189	7.912792
India	Returns	1229	0.000303	4.520748	-4.514899	0.224942	-0.002307	301.072
	Trading volume	1215	12.33155	15.87117	6.214608	0.571783	-2.256989	34.4144
China	Returns	1218	-7.71E-05	0.05636	-0.088729	0.015084	-1.201836	9.9965084
	Trading volume	1218	23.73865	25.17424	22.67771	0.457092	0.930787	3.32118
S.A	Return	1247	0.000121	0.038977	-0.040493	0.010289	-0.217739	4.1255
	Trading volume	1221	18.67574	20.20486	17.13658	0.357255	0.346799	6.202409

Results in the table show that the most liquid markets depending on Max, Mean, Min trading volume statistical measures are as recorded in order from the highest to lowest liquidity as; China, US, Russia, UK, Italy, South Africa, Germany, France, Brazil, Japan, India. The highest volatile market is the Chinese market recording the highest number of trading transactions while the Indian market is the lowest volatile market.

From the table, we can also notice that the highest degree standard deviation of return is observed in the Japanese market and the lowest degree of standard deviation is observed in the Canadian market.

The negative values of skewness in return is observed in most of the countries except Russia and India. High kurtosis in returns for investors means that they will experience occasional extreme returns (positive or positive), when the kurtosis value is – or + three times the standard deviation from the mean of normal distribution returns.

We continue to test the stationary of the data used by applying ADF and PP tests. Since three of the independent variables, overconfidence, excessive optimism and excessive pessimism are in the form of dummy variables, there is no need to apply the stationary test for these dummy variables. Stationary test is applied only for trading volume and rational expectations.

Table 4 - ADF and PP unit root test for Trading volume and Rational expectations

(1% Critical value : -3.4344) (5% Critical value : -2.8632) (10 % Critical value : -2.5677)

	ADF*		PP**	
Capital Market	Trading volume	Rational Expectation	Trading Volume	Rational Expectation
Canada	-10.07848	-32.40681	-31.45678	-32.30654
France	-7.7177908	-34.85602	-25.19183	-34.97442
Germany	-10.97524	-35.659	-28.05466	-35.68005
Italy	-9.909514	-37.92996	-29.73769	-37.98903
Japan	-4.962701	-16.66696	-26.4729	-226.7409
UK	-29.33866	-34.74614	-29.6596	-3.21531
U.S	-14.31779	-36.34448	-22.24068	-36.34448
Brazil	-7.68993	-31.78284	-29.57192	-53.10022
Russia	-33.28379	-31.50155	-33.28777	-671.2291
India	-18.15747	-17.86674	-23.75026	-617.7701
China	-4.539875	-33.25581	-5.97282	-33.25798
South Africa	-10.41538	-36.260700	-22.69159	-36.30844

ADF refers to "Augmented Dickey-Fuller" unit root tests, PP refers to "Phillips-Perron" unit root tests.*

The results of ADF and PP unit root tests indicate that all tested data of all different markets are stationary at 1% critical level. After testing the stationary of our data, we

continue to estimate the final results of our analysis using a linear regression model. The results are observed in table 4 bellow.

Table- 5: Regression results

Capital Market	Independent variables	Coefficient	Std.Error	Prob.	Adjusted R-squared
Canada	Overconfidence	-0.011415	0.026187	0.663	0.02105
	Excessive optimism	0.0694	0.037638	0.0654*	
	Excessive pessimism	-0.15477	0.04057	0.0001***	
	Rational Expectations	3.26331	3.021745	0.1941	
	Constant	19.2674	0.044508	0	
France	Overconfidence	0.007636	0.026873	0.7763	0.067883
	Excessive optimism	0.188163	0.039254	0.0000***	
	Excessive pessimism	-0.229097	0.043192	0.0000***	
	Rational Expectations	-1.001187	1.93793	0.6139	
	Constant	18.51445	0.046817	0	
Germany	Overconfidence	0.054832	0.026502	0.0388**	0.092213
	Excessive optimism	0.197174	0.03782	0.0000***	
	Excessive pessimism	-0.230052	0.040639	0.0000***	
	Rational Expectations	-3.61744	1.944303	0.0630*	
	Constant	18.45907	0.044627	0.0000	
Italy	Overconfidence	0.02295	0.039267	0.5590	0.000468
	Excessive optimism	-0.010232	0.056526	0.8564	
	Excessive pessimism	-0.064134	0.061254	0.2953	
	Rational Expectations	-0.140089	2.195343	0.6036	
	Constant	19.98789	0.066313	0	
Japan	Overconfidence	0.01021	0.025639	0.6931	0.047045
	Excessive optimism	1.055491	0.162552	0.000***	
	Excessive pessimism	-0.190505	0.44476	0.6685	
	Rational Expectations	0.004983	0.025039	0.8423	
	Constant	11.71711	0.445156	0	
UK	Overconfidence	0.025316	0.053514	0.6362	0.016015
	Excessive optimism	-0.242684	0.077229	0.0017***	
	Excessive pessimism	0.144956	0.079937	0.0700*	
	Rational Expectations	2.900875	4.800147	0.5457	
	Constant	20.07074	0.08796	0	

U.S	Overconfidence	-0.01441	0.013714	0.3061	0.180398
	Excessive optimism	0.092774	0.01981	0.000***	
	Excessive pessimism	-0.188673	0.025563	0.000***	
	Rational Expectations	0.339977	1.327187	0.7979	
	constant	22.16028	0.027512	0	
Brazil	Overconfidence	0.009274	0.019356	0.6319	0.300360
	Excessive optimism	0.22295	0.039643	0.0000***	
	Excessive pessimism	-0.171729	0.041983	0.0000***	
	Rational Expectations	0.000565	0.472594	0.9990	
	Constant	15.27178	0.041496	0	
Russia	Overconfidence	0.025741	0.020262	0.2042	0.000352
	Excessive optimism	-0.504236	0.429064	0.2401	
	Excessive pessimism	-0.404472	0.298361	0.1755	
	Rational Expectations	0.093962	0.076264	0.2182	
	Constant	20.48746	0.298511	0	
India	Overconfidence	0.068862	0.039739	0.0830*	0.007121
	Excessive optimism	-0.056628	0.43722	0.8985	
	Excessive pessimism	-0.152184	0.047911	0.0015***	
	Rational Expectations	0.140553	0.097916	0.1514	
	Constant	12.41369	0.035016	0	
China	Overconfidence	0.09657	0.03156	0.0023***	0.154248
	Excessive optimism	0.707169	0.047992	0.0000***	
	Excessive pessimism	-0.697669	0.420777	0.0976*	
	Rational Expectations	-8.758204	1.198226	0.0000	
	Constant	24.30974	0.420422	0	
South Africa	Overconfidence	-0.061841	0.033896	0.6830	0.02311
	Excessive optimism	0.106404	0.04259	0.0126**	
	Excessive pessimism	-0.155407	0.054218	0.0042***	
	Rational Expectations	0.625349	2.482807	0.8012	
	Constant	18.83588	0.062361	0	

**** indicate 1% significant level, ** state for 5% level of significant, * represent 10% level of significant*

Results in table 5 indicate that the rationality hypothesis of investor's behavior can be rejected for all the markets except the case of Germany.

The results for G7 countries can be summarized as follows. In Canada, the result reveals that excessive pessimism has a negative and significant effect on the trading volume at a 1% level of significance. Excessive optimism has a positive and significant effect on the volume of trade at a 10% level of significance. Other variables show no significant effect on the volume of trade in the Canadian stock market. In the case of France, the results indicate that excessive optimism has a positive significant impact on the trading volume in the French stock market at 1% significant level. Excessive pessimism has a negative influence on the trading volume in the French market at 1% levels of significance. The results for Germany was interesting being the only market in our study that shows a significant effect of all tested variables on the trading volume. Excessive optimism has a positive influence on the trading volume in the German stock market at 1 % significant level. Excessive pessimism has a negative impact on the trading volume at 1% significant level. Overconfidence has a positive effect on the trading volume in the German stock market at a 5% level of significance. Rational expectations have a negative impact on the trading volume at a 10% level of significance in the German stock market and that is interesting because the rational expectation hypothesis can't be rejected only for the German market in our analysis. In Italy, the results were surprising being the only market in our analysis that shows no significant effect on the trading volume for all tested variables. The rational expectations hypothesis can be rejected and all other tested variables excessive optimism, excessive pessimism and over overconfidence are not effecting the investors' decisions. In Japan the rationality hypothesis can be rejected, excessive optimism has a significant impact on trading volume in the Japanese market at a 1% level of significance. Other variables show no effect on the trading volume, and this implies that in Japan investors are influenced by excessive optimism biases while taking any trading decision. United Kingdom results indicate that excessive optimism has a negative impact on the trading volume in the British stock market at 1 % levels of significance. Excessive pessimism has a positive effect on the trading volume at a 10% level of significance, other variables show no significant effect on the trading volume, rational expectations hypothesis can be rejected. United States results show that rational expectations hypothesis can be rejected, optimistic investors have positive influence on the trading volume at 1%

significant level, pessimistic investors have negative impact on the trading volume at a 1% level of significance.

The BRICS results can be summarized as follows. In Brazil, optimistic investors have a positive influence on the trading volume at 1% significant level. Pessimistic investors have a negative impact on the trading volume at a 1% significant level. Russian results were surprising in similar way to Italy. It also showed no significant effect on the trading volume for all tested variables. The rational expectations hypothesis can be rejected; all other tested variables are not affecting the investor's decisions. In India, pessimistic investors have a negative influence on the trading volume at a 1% level of significance. Overconfidence has a positive impact on the trading volume at a 10% level of significance. Other variables have no significant effect on the trading volume. In China, the rationality hypothesis can be rejected, over overconfidence investors have a positive significant effect on the trading volume at a 1% significant level. Excessive optimism has a positive influence on the trading volume in the Chinese stock market at 1% significant level. Excessive pessimism has a negative influence on the trading volume at a 10% level of significance. Finally, the South African stock market, rationality hypothesis can be rejected, pessimistic investors have a negative influence on the trading volume at a 1% level of significance. Excessive optimism investors have a positive impact on the volume of trade at a 5% level of significance. Other tested variables have no significant effect on the trading volume.

5.CONCLUSION

several research papers try to test and explain investor's behavioral biases in financial markets that deviate their choices in most of the cases from rationality standard, however, there is only one way to make a rational choice and many ways to make irrational choices, which make it easier for people to fall in mistakes and follow their own biases, in my study I examine three behavioral biases; overconfidence excessive optimism excessive pessimism in addition to the rational expectations factor that might influence the trading volume in G7 and BRICS countries; Canada, France, Germany, Italy, United Kingdom, United States, Japan, Brazil, Russia, India, China and, South Africa, by using the main market index of each country from 2015 through 2020. By using a linear regression model that tests the effect of the investor's behavioral biases and rationality on the trading volume.

The main advantage of this paper is that it depend on a model that transfer the behavioral biases into logical and conditional equitation consisting mainly from the returns and the risk which are the most factors that interest any investors , and here we can notice the differential among people by their preferences , degrees of risk taking , and the return expected , we should also mention that there is a cultural behavioral characteristics among countries , the culture finance field is now working to find the similarities among investors coming from the same culture , for example from a study for Greet Hofstede 2016 , that tries to make a comparison among countries in terms the degree of loss aversion , and it shows that high loss aversion degrees in the world can be found in Russia , India , Canada , Italy , Japan and Germany , While lowest degrees of loss aversion which indicate being risk takers is found in China France , and USA , these measures can also explain the optimism and pessimism behavior among investors while accepting or refusing risk , people are influenced by their communities , and others experiences , especially when they don't have the enough information or knowledge of trading they depend on the others opinion or they just follow their emotions , and this is not healthy for the financial markets , because we always seek to regulate the market and the prices to be fair value and we want the investors

to achieve their goals by making more rational decisions , unfortunately the real world is not optimal , and only few people reach the rational way of making decisions , we all have cognitive and emotional biases , and as we explain before the cognitive biases can be eliminated by learning , while emotional biases is impossible to be corrected , the only way to avoid emotional biases is to know it and to be aware of it , while making any trading decisions.

The findings of this research are mostly in line with the previous papers. The reject the rationality hypothesis for trading decisions for all the countries in this research except for the case of Germany which shows a significant effect of rationality at 10% level. This might be a sign that investors in Germany made more rational decisions than other tested markets but this alone cannot imply that they are less affected by behavioral biases than other country markets because as the results indicate, German investors are also affected by the three behavioral biases we have included in our analysis. The overconfidence behavior in Germany is already tested by Glaser et al (2012) and found that financial stability and the increase in age might be the reasons behind higher degree of overconfidence. In our analysis, Overconfidence biases is found on only two markets that are Germany and Indian markets.

In the case of Russia and Italy, we found out that trading volume is not influenced by any of tested biases, neither by the rationality factor. I recommend further research could focus on other factors or reasons to explain the trading volume behavior in these two unique markets.

There are certain similarities between the tested markets. The finding indicates that six of the markets have similar behavioral characteristics. In Canada, France, United Kingdom, United States, Brazil, and South Africa excessive optimism and excessive pessimism have a significant effect on trading volume.

The Japanese market shows only one influence which is excessive optimism behavior. The stability in Japanese markets might be a reason behind the effect of optimistic investors (Solis & Urata, 2018).

To conclude our point of view, investors play a key role in the financial markets all around the world. There are certain characteristic differences and similarities among developed and developing countries's capital markets. This paper contributes to the literature in underlining these behavioral similarities and differences. It aims to help individual, institutional investors, and financial advisors to make more efficient financial choices and recommendations.

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Johannesburg general info , available from : <https://www.jse.co.za/>

London stock exchange general info , available from : <https://www.lond

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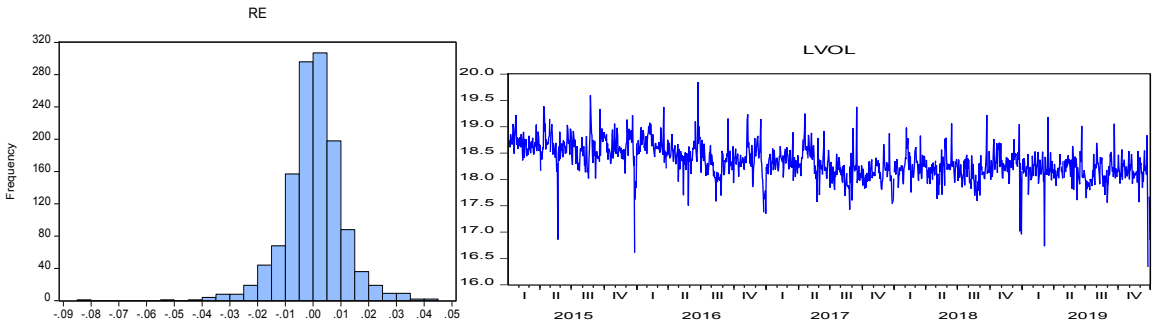
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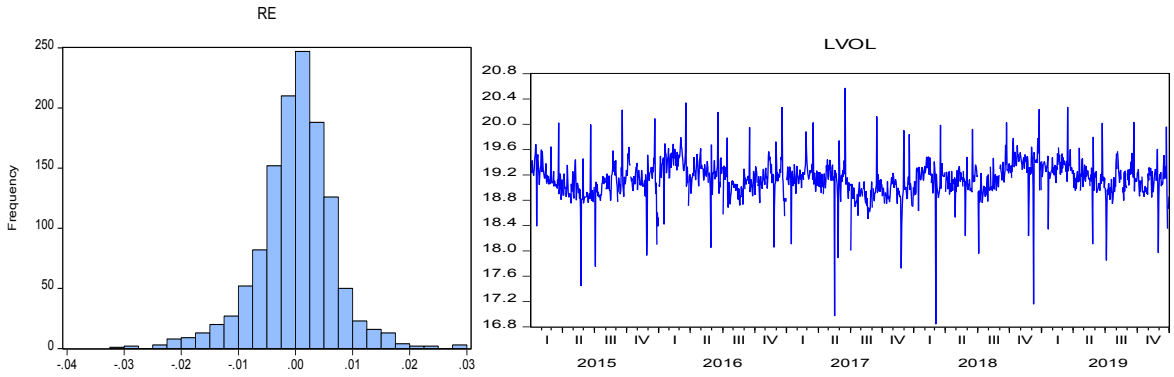
APPENDIXES

Return Distribution and Trading volume volatility of the 12 tested Market data.

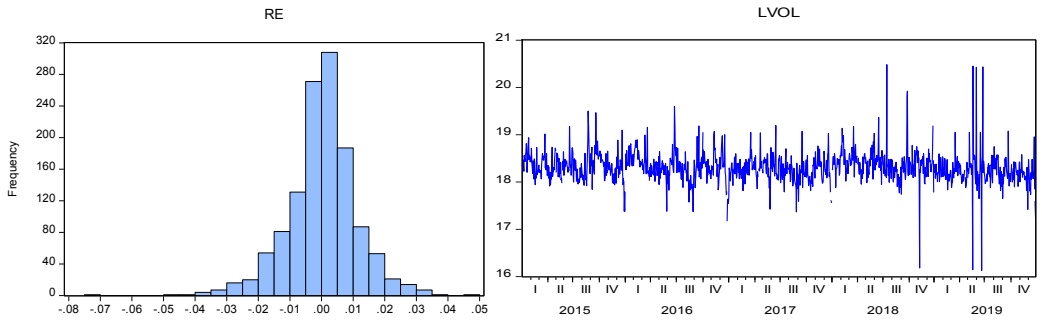
French Stock Exchange Market



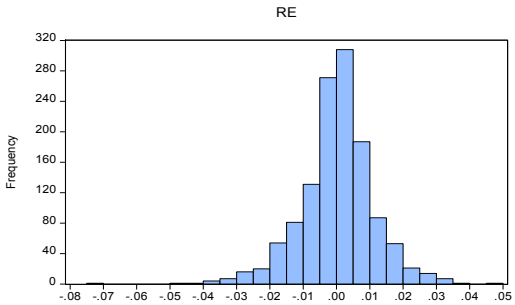
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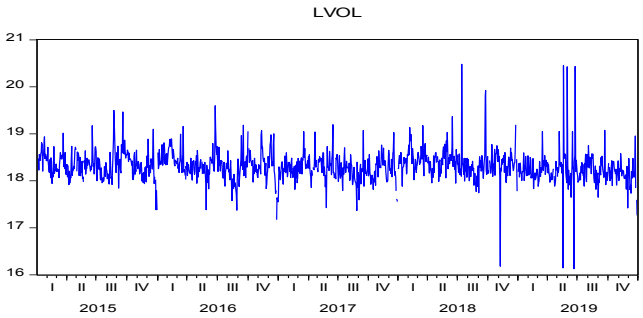


German Stock Exchange

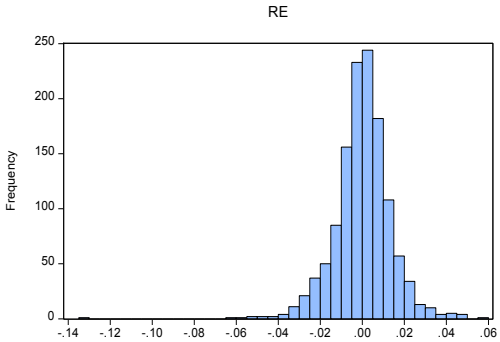


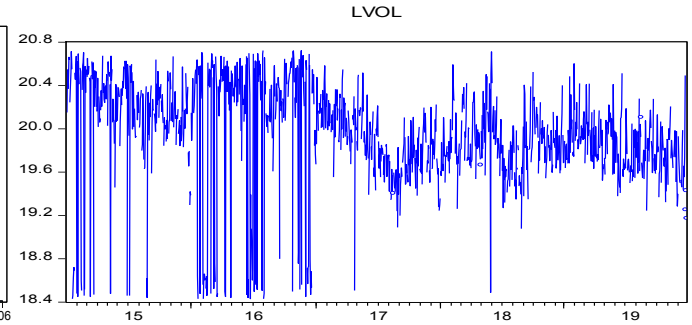
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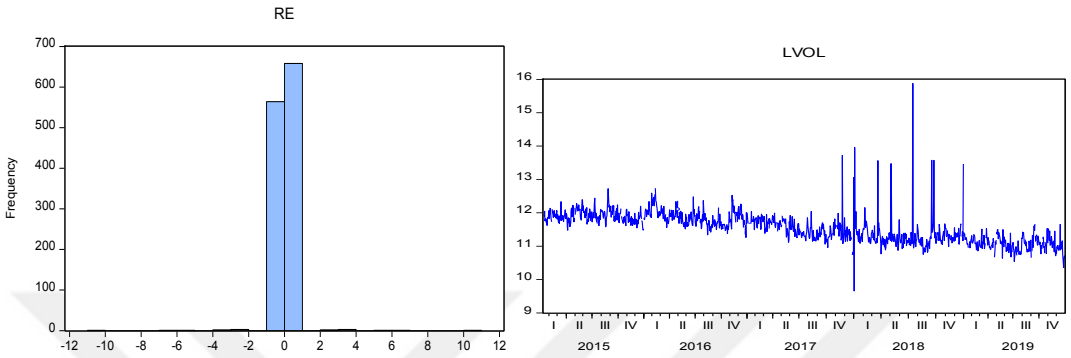


Italian Stock Exchange

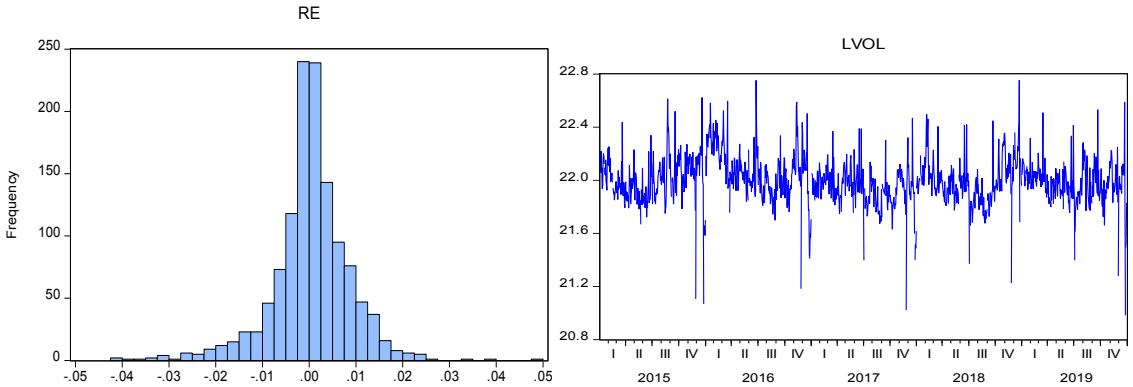




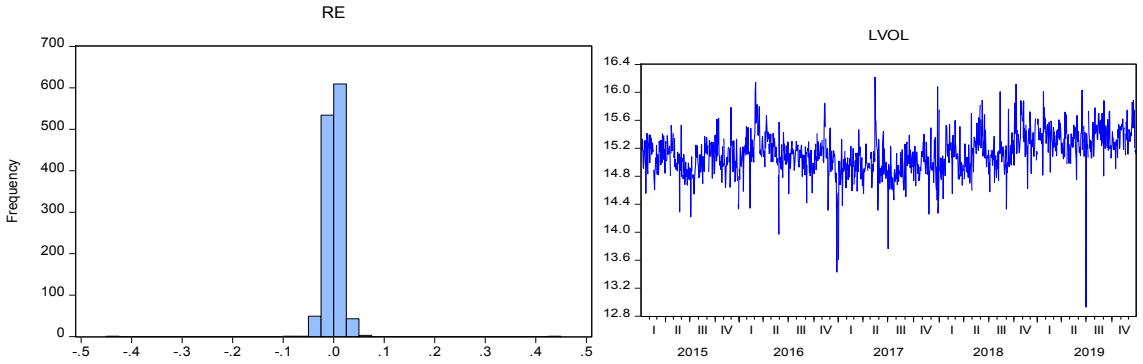
Japanese stock exchange



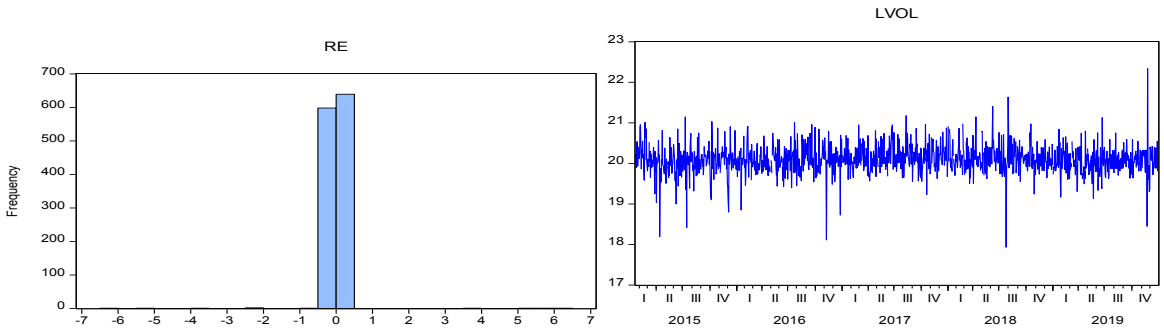
American Stock Exchange



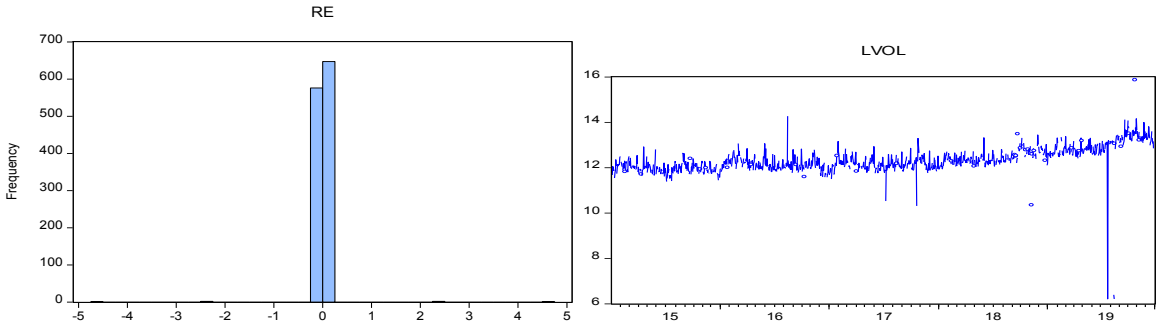
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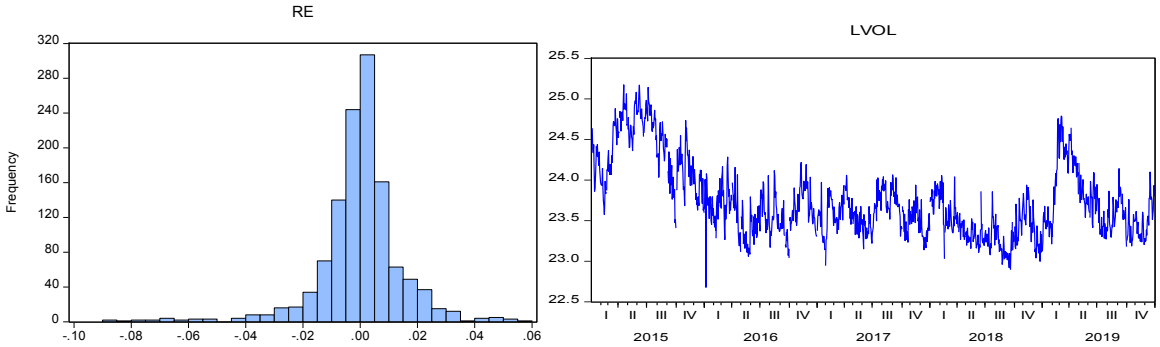
Russian Stock Exchange



Indian Stock Exchange



Chinese Stock Exchange



South African Stock exchange:

