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THE BEHAVIORAL BIASES OF INVESTORS: AN EMPIRICAL ANALYSIS OF CHINA AND RUSSIA

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INTRODUCTION

Behavioral finance is a new and spreading field in the area of economics and finance and focuses on the analysis of investing decision behavior through the application of psychology and traditional economic-finance elements. The main assumption of behavioral finance is that market inefficiencies are caused by investors, that are not always able to act in a rational manner, since human beings are naturally led to filter events through their experience and emotions.

Traditional finance assumes that all players in the markets are perfectly rational and always capable of increasing their payoffs and wealth, in contrast with irrational players, who lack the required skills for success.

To have a more specific knowledge of behavioral finance, the efficient market hypothesis must be taken into consideration. Firstly, advanced by Fama in 1965, it supports the idea that stock markets are perfectly efficient and security's prices always reflect all available information and when new announcements reach the market, prices adjust immediately. One interrelated theory to the efficient hypothesis is the random walk theory, which sustains that stock's prices cannot be predicted by analysing past price movements.

Throughout the 1970s, these theories were acknowledged by most of the community of researchers. Nevertheless, in 1979, Kahneman and Tversky first put under discussion the real validity of the EMH, pointing out that market's players often estimate wrong expectations about possible outcomes when they face risk. Indeed, it was demonstrated that a risk-averse behavior is generally common among investors. So, for the first time, it was taken into account the possibility that economic decisions could be distorted by psychological biases.

Then, in the 1990s, behavioral finance flourished along with the advancement of psychology, focusing on the main role of emotions in the decision making process. In those years, the economist Thaler contributed heavily to the discoveries of behavioral finance, being able to forecast the Internet stock bubble, by demonstrating that the American security market

was 20-30% overestimated and that prices could anyway increase due to the few number of investors willing to speculate on a decline[1].

Moreover, arbitrage does not assure that markets will be able to correct themselves, therefore, they will not fix prices quickly and efficiently.

Nowadays, the main objective of behavioral finance is to evaluate the possible factors that lead to market booms and collapses and to what extent the 'human element' is involved.

The main aim of this thesis, then, is to provide a general overview of the contents of behavioral finance and an explanation of the main behavioral biases that investors face when subject to certain psychological decisions when investing. The thesis deals in particular with the analysis of the main irrational behaviors in investing: overconfidence, availability heuristic, prospect theory, anchoring, framing and herding behaviors.

A specific attention is given to two countries, China and Russia. In the first case, the analysis will be focused on the trading performance of investors and their behavioral biases (disposition effect, overconfidence and representativeness bias), while in the case of Russia it will be addressed the problem of the efficiency of the stock market, with reference to the most widespread bias, herding. Among the many studies conducted on this subject, at the moment it can only be mentioned the research of the economists Ali Said and Alan Harper, who tested the efficiency of the Russian Stock Market. The results showed that the Russian stock prices do not incorporate all the information from past prices and investors can earn abnormally high profits by speculating on market inefficiencies[2].

[1] More precisely: "the US stock market is 20-30 percent overvalued; yet, prices can continue to increase because the investors who are willing to bet on a decline have too few dollars to prevail first, in the US market, the largest investors [...], typically use some rule of thumb for asset allocation [...], and are thus relatively insensitive to the level of asset prices".
Thaler, *the end of behavioral finance*, Financial Analysts Journal, 1999, vol. 55, n°6, p.12-17

[2] Said and Harper, *The Efficiency of the Russian Stock Market, a Revisit of the Random Walk Hypothesis,* Journal of Accounting and Financial Studies, 2015

1. INFORMATION ON FINANCIAL DECISION MAKING

In a logical world, financial choices are taken by investors in order to increase the expected payoffs. Rational investors have all the information available on expected risk and return and, on the basis of such information, they take decisions, valuing stocks according to their intrinsic value, that is the net present value of future cash streams minus the risk associated. After having acquired new knowledge about intrinsic values, investors react pushing up prices when there are profitable announcements and pushing them down when there are poor announcements. Generally, investors make use of models based on expected risk and the corresponding return for taking any decision, exploiting risk based pricing theories such as the Capital Asset Pricing Model and the Arbitrage Pricing Theory. Also environmental elements must be taken into account, which can be related to a particular situation in the market or to the investor himself and to deal with these conditions, an investor has to make use of behavioral psychology. Indeed, recent theory shows that investors are not always able to make rational decisions when doing investments, since they suffer from several behavioral biases, which turn them to be vulnerable. Tversky suggested that:

1) investors are not always risk averse,
2) they interpret the events differently,
3) their forecasts often result to be biased[3].

1.1 STOCK PRICES

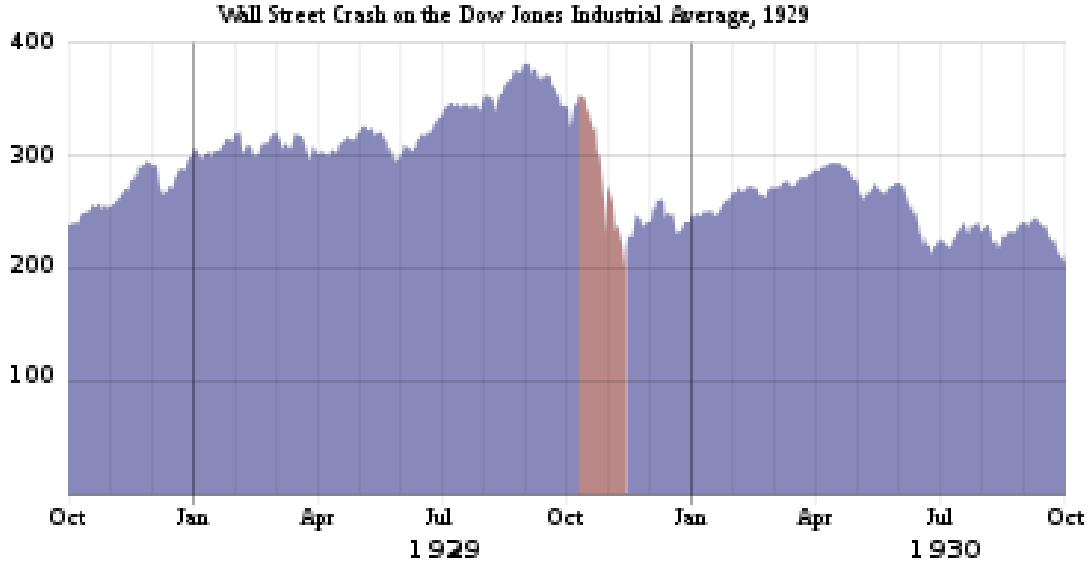
1.1.1 WHAT IS A STOCK?

In 1929, the security's prices on the New York Stock Exchange collapsed. This event, also known as the Wall Street Crash, determined the beginning of the Great Depression and it is considered as the most disastrous crash in American history. Companies that had lead technological innovations (radio, telephone…), such as Radio Corporation of America and General

[3] Tversky, Slovic, Kahneman, *The Causes of Preference Reversal*, the American Economic review, vol 80, n° 1, p 204-217

Motors, suffered from a huge fall in their stocks' value.

TAB 1. THE DOW JONES INDUSTRIAL AVERAGE, 1929[4]



The table above shows the stock's value of Dow Jones Industrial Average between 1929 and 1930. On September 1929, the D&J reached the maximum value of 381.2 points, before falling to 260 points on October 24, the so called Black Monday. On the following day, the Black Tuesday, its value fell by 30.57 points (23% decrease), continuing to decrease until D&J had lost 89% of its original value[5]. So, as it can be easily seen, stocks and stocks' prices pay a major role in determining the stability of the economic system.

But what is a stock? And what are the methodologies to assess its prices?

Stocks (or shares or equities) are financial tools that correspond to a fraction of the share capital of companies. They are usually issued in order to obtain funds in the form of equity capital and, as a compensation for the capital contribution, the party acquires the right to become a shareholder and, therefore, he is given administrative and financial powers.

Shares may be classified in different ways and may embody different characteristics. First of all, the holder of a common share has the right to

[4] www.spmib.it
[5] Data from Board of Governors of the Federal Reserve System (1943).

vote in the Annual General Meeting, that is an annual meeting of the shareholders where the holders of the majority of securities, who are present and have the right to do so, elect the Directors[6].

Other rights encompass:

1 The right to distribute the corresponding dividends paid. They can be seen as the return on the capital directly or indirectly granted to the company by shareholders. The method of payment depends upon the board of directors[7];
2 the right to receive proportionally the assets left, after liabilities due have been exhausted in case of liquidation;
3 the right to vote on matters of major concern (for example a merger) at the Annual Meeting or a Special Meeting[8].

Moreover, shareholders sometimes may enjoy the *preemptive right,* that is the right to receive additional shares in any future issue of new securities. In simple words, a corporation that aims at selling shares to the public, has first to donate them to shareholders.

Common stocks (or ordinary share) refer to those shares traded both on the public stock exchanges (e.g. NYSE) and those traded among private individuals, such as investors. The value of an ordinary share is given by the market environment, the value of the company issuing its securities and investors' feelings about the company. An example may be Class A Common stocks of Berkshire Hathaway Inc., whose stocks trade above

[6] However, the specific method for designating directors differs across companies. The most common difference is whether shares must be voted by straight voting or by cumulative voting. The former guarantees minority participation and the total number of votes that each shareholder may distribute is determined initially. The latter, instead, prescribes that directors are named one at a time. Another frequent method, much done in large public companies, is proxy voting, which allows a third party to vote on behalf of the shareholder.

[7] However, if a dividend is not announced by the board of directors, the company cannot default on an undeclared dividend and dividends given to shareholders are subject to tax purposes, even if companies have the possibility to cut out 70% of dividend amounts received.

[8] A special meeting may be called for removing some or all of current directors, changing in size of the board of directors, the nomination of new directors to occupy vacancies and or to abrogate amendments to the bylaws or certificate of incorporation.

330.000$ on the New York Stock Exchange on January 2020[9].

The other typology of shares includes Special shares; which value is often higher than Common shares. This is due to the fact that in most companies, shareholders (called also preferred shareholders) have the right to share a higher dividend and enjoy a priority participation in case of liquidation but they do not carry voting rights. For this reason, Special shares are usually issued by investors who seek for profitable returns from the company. The main categories are privileged share, limited voting and savings shares.

Estimation of shares is based on the discounting expected future cash flows, which, in case of stocks, are expressed by dividends and the subsequent selling price of the security. The earnings that investors receive is expressed in terms of capital gain, or the difference between the price at which the share is purchased and the price at which it is sold. Simply speaking, capital gain is the result of a rise in the value of the security over time.

Another way to earn higher returns from securities is derivatives. This is a riskier method since derivatives are financial securities that are determined by the value of the assets themselves (stocks, bonds). They can be distinguished between put options and call options. The former gives the possibility to buy at a fixed price at a certain date, implying that investors make profits when the security's price increases, because they can purchase it at a lower price and sell it at today's price; the latter gives the possibility to sell at a fixed price, so that investors earn when the security's price decreases, buying at a future lower price and sell it at a higher one.

There are two different approaches to assess share prices.

The most used method is fundamental analysis. It makes use of past and present data in order to make an estimation of the intrinsic value of the security on the basis of its future earnings and return on investment. It relies upon the idea that there could be an incorrect security's pricing in the markets in the short period but, eventually, markets will correct

[9] Source: www.Nasdaq.com

themselves[10].

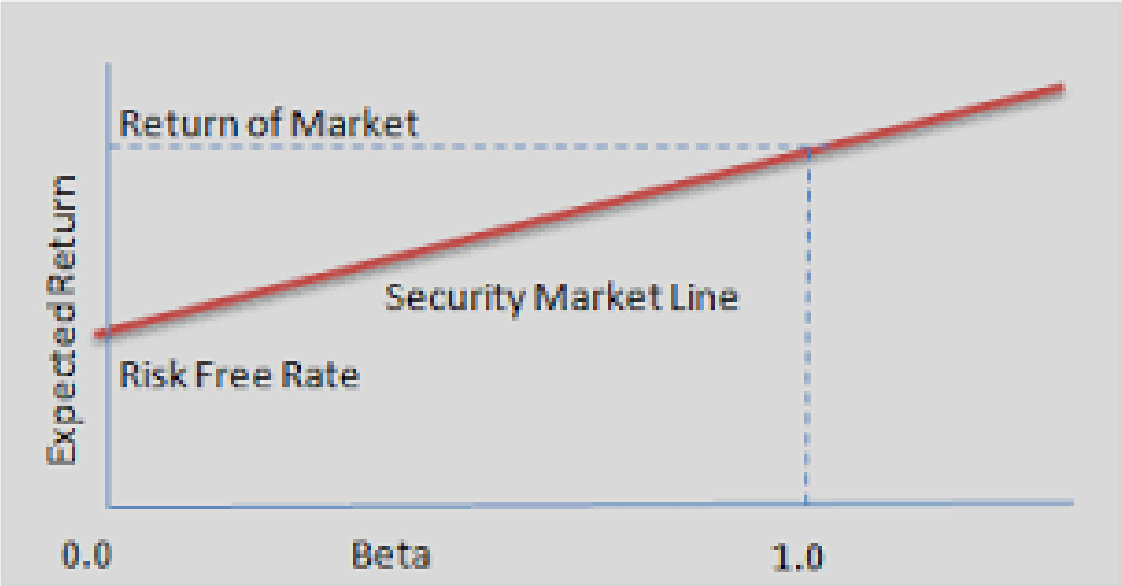
Technical analysis, instead, looks at the analysis of past stock data to determine the future direction of stock prices, stating that there can be found observable price patterns linked to behavioral and emotional reactions of investors to price fluctuations. However the main implication of this theory is the subjective nature of the analysis, which bases the price of the stock on its intrinsic value and on the standard deviation from this value due to changing environment and human feelings[11].

1.1.2 CAPITAL ASSET PRICING MODEL

The Capital Asset Pricing Model (CAPM), first modelled by Sharpe, Lintner and Treynor, represents the link between systematic risk and expected return for securities. It states that “in equilibrium the expected excess return on a security over and above the pure interest rate equals some constant times its ex ante risk, measured by the security's so-called beta coefficient”, underlying that all investments must lie along the security market line. This model is commonly used for determining the price of risky assets and the associated expected returns.

[10] “However, the application of this analysis may lead to significant abnormal returns, since a significant portion is generated after earnings announcements. Findings consistent with the analysis prediction of earnings”.
Abarbanell and Bushee, *Abnormal Return to a Fundamental Analysis Strategy,* American Accounting Association, 1998, p. 19-45.
[11] Mamaysky, Wang, *Foundations of Technical Analysis: Computational Algorithms, Statistical Inference and Empirical Implementation*, National Bureau of Economic Research.

TAB 2. THE CAPITAL ASSET PRICING MODEL[12]



The formula of the CAPM is given as:

$ERi = Rf + \beta i\ (ERm - Rf)$

Where:

- ERi is the expected return of investment
- Rf is the risk-free rate
- βi is the beta of the investment
- (ERm – Rf) is the market risk premium

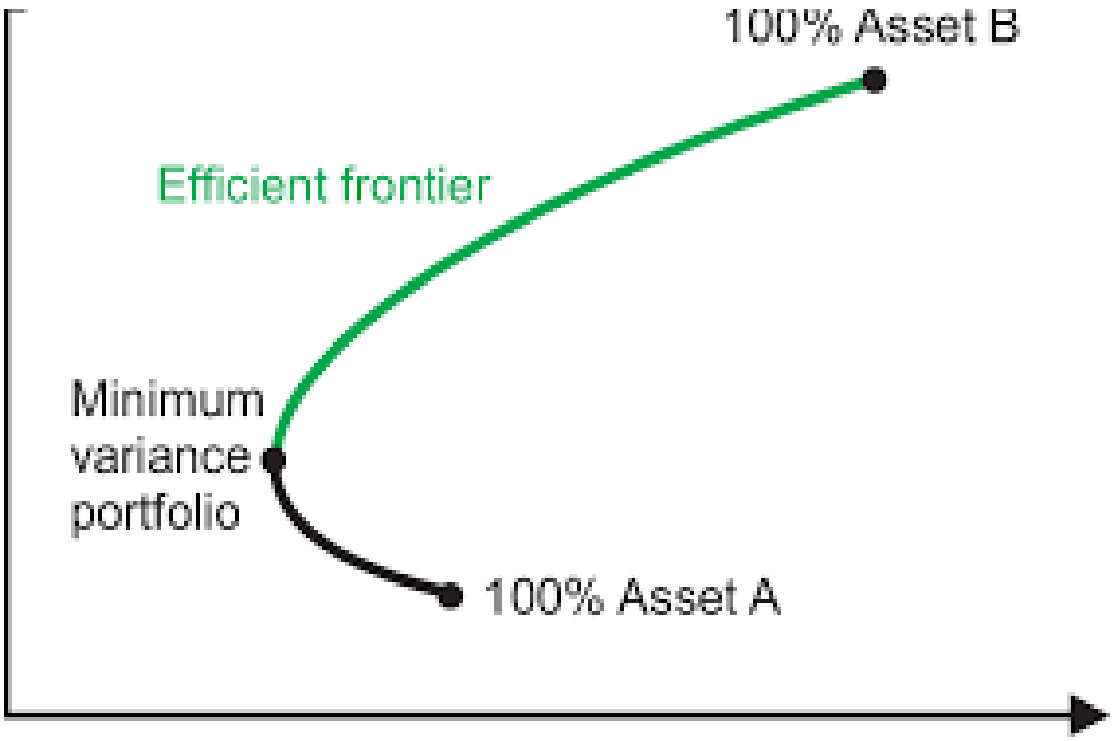
Beta shows the amount of risk related to the market portfolio; when its value is higher than one, the stock has more risk than the market, otherwise if its value is less than one. Then, investors assume to be rewarded taking into account risk and the time value of money, which is expressed by the risk-free rate. It is the expected interest that investors forecast from an investment with zero risk over an exact period of time or, in other words, the minimum return that an investor is willing to accept given that the possible rate of return is greater than the risk-free rate.

If an investor could apply efficiently the CAPM to optimize the return of a

[12] From Brealey, Myers, Allen, *Principles of Corporate Finance,* the Mc-Graw-Hill, p. 192

portfolio in connection with the risk, it would be possible to draw the efficient frontier, a curve in which lies the set of efficient portfolios, combining the highest expected return and a specific degree of risk.

TAB 3. THE EFFICIENT FRONTIER[13]



On the y-axis it is represented the expected return and on the x-axis the expected risk is drawn. The efficient frontier is the basis of portfolio theory, first theorized by Markovitz, that formalizes the concept of diversification in investing, advising that the expected return of a bundle of securities raises as the associated risk raises. Any combination of assets that lie on the Capital Market Line (CML) offers the best possible allocation and can be considered as a trade-off between return and risk. Since it is not possible to build an efficient portfolio that fits totally the CML, investors usually bear too much risk as they look for further return.
So, the Efficient Frontier Theory and the CAPM have equal implications between return and risk and, for both models, the estimations can be

[13] Markovitz, *Foundations of Portfolio Theory*, Journal of Finance, 1991, p. 469-477

forecasted only theoretically, since it is almost impossible to predict future returns.
Indeed, there are several hypotheses that have been revealed not applicable in the real world but, nevertheless, the CAPM allows to make comparisons between different investments.

The main drawbacks include:

- Beta implies that risk can be determined by a security's price volatility, but the method to assess volatility is imprecise since return and risk do not follow a normal distribution;
- the risk-free rate is given as stable over the periods. The portfolio used to calculate the risk premium gives only a theoretical value and it is not possible to purchase or invest in it. Indeed, the most common index used is the S&P 500, an imprecise estimation of risk;
- the presumption that it is possible to determine future cash flows through discounting has been revealed imprecise and inapplicable since an investor cannot calculate the expected return of a security efficiently.

1.1.3 ARBITRAGE PRICING THEORY AND ARBITRAGE

The arbitrage pricing theory is an alternative to the CAPM. This model, differently from the CAPM, does not focus on which portfolios are efficient but it postulates that a stock's return can be estimated through the linear relationship of return, a series of macroeconomic factors and "noise", elements unique of that company. More precisely, according to Ross "the APT is based on a linear return generating process as a first principle, and requires no utility assumptions beyond monotonicity and concavity. Nor is it restricted to a single period; it will hold in both the multiperiod and single period cases. […] Unlike the CAPM, there is no requirement that the market portfolio be mean variance efficient"[14].
Given that, there are two elements that characterize the expected return on a stock: first, the stock's characteristic and, second, its sensitivity to those factors.

[14] Roll, Ross, *The Journal of Finance*, Vol 35, n° 5, 1980

This link is represented by a regression:

$ERi = ERz + (Ei - ERz) \times \beta n$

Where:

- ERi is the expected return of the asset
- Rz is the risk-free rate
- βn is the sensitivity of the asset to a macroeconomic factor n
- Ei is the risk premium

Differently from the CAPM, in which markets are efficient, APT states that stocks may be mispriced, before the securities go back to their fundamental value. Thus, investors believe to make use of any deviation from intrinsic market value.

The APT is certainly more complicated than the CAPM since it takes into account multiple factors and requires substantial research to assess how a stock may respond to the macroeconomic elements, which is the systematic risk that portfolio diversification cannot cancel out. The factors more commonly used as price determinants are unexpected changes in inflation, gross national product, corporate bond spreads, changes in exchange rates, gross domestic product and so on.

Moreover, it is necessary to explain more in specific the concept of *arbitrage.*

It is the outcome of inefficiencies in the markets and provide that prices of securities may differ considerably from their fundamental value for a long time, even if investors, taking advantage of these inefficiencies, turn the markets to re-equilibrate themselves. With technology's innovations, it is even more problematic to make profits from mispriced securities since any incorrect pricing arrangement is corrected faster and eliminated quicker.

In general, the no-arbitrage principle takes place: there is no opportunity for arbitrage in financial markets, with the implication that two securities, having the same payoff, have the same price. If not, arbitrage possibilities would exist and investor could make profits. It also gives a better estimation of security's prices since it involves only the existence of one intelligent investor in the market.

1.2 THE EFFICIENT MARKET HYPOTHESIS

The efficient market hypothesis derives its formulation by the British statistician Maurice Kendall who, in 1953, published a paper on the Journal of the Royal Statistical Society on the behaviour of stock and commodity prices. Through the analysis of an economic time series, he predicted to find typical price cycles, but they did not seem to occur as "it began to appear that the classical method of analysing stationary economic fluctuations into cycles and residual elements broke down". Each series appeared to be a 'wandering' one, almost as if "once a week the Demon of Chance drew a random number… and added it to the current price to determine the next week's price" [15]. Briefly speaking, the prices of stocks and commodities seemed to follow a random walk.

The most crucial consequence of this theory is that prices of securities in financial markets reflect all publicly available information.

To better understand how an efficient market works, it could be useful to make a generic example. Suppose Space X, the company owned by Tesla Motors Inc., is attempting to develop a new type of rocket that will revolutionize space technology. Space X is convinced that the project has positive net present value.

Consider a share of stock in Space X. What are the elements that assess the willingness of investors to invest in shares of Space X at a specific price? The first factor would be the probability that the company will be the first to develop the new rocket. In an efficient market, it could be forecasted the price of the shares to increase as long as this probability raises. Now, presume the company hires a famous engineer to develop the rocket. When will the raise in the price of Space X's shares take place? The hiring announcement is published in an article on Monday morning. In an ideal market, the price of shares of the company will instantly adjust to this new announcement so that investors should not be able to buy the stock on Monday afternoon and make profit on Tuesday, meaning that the stock market had a day to adjust the announcement of Space X.

Briefly speaking, the efficient market hypothesis states that the price of shares of Space X stock on Monday afternoon will already incorporate the

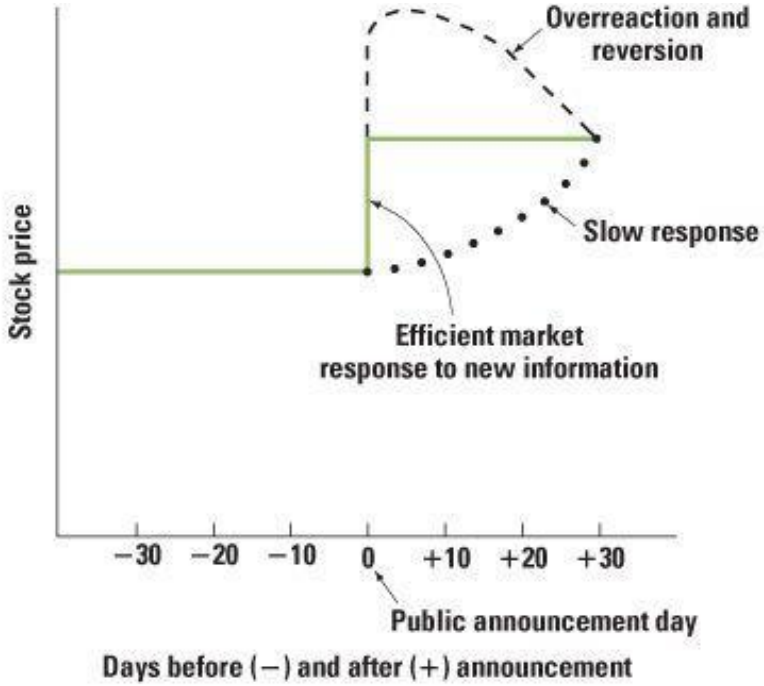
[15] Kendall, *The Analysis of Economic Time Series*, part 1: prices, 1952 (par 1)

information contained in the Tuesday morning announcement.

This theory has some implications both for investors and companies. First, it implies that every investment is good because the stocks' prices are correct so that investors should only forecast to gain a normal return and the price adjusts before they can speculate on it. Second, a security's price reflects all available information about the intrinsic value of the security, meaning that the price of securities corresponds to the present value. Thus, good chances of making extremely high profits are not possible in efficient markets. Third, security prices can be exploited to estimate the cost of capital, or, in other words, the opportunity cost of making a specific investment. The cost of capital can be better defined as the required rate of return to persuade an investor to make an investment.

The graph below shows the reaction of a stock price to new announcements in two different markets. The green line illustrates efficient market response to new information where price adjusts instantaneously to new information with no further price changes. The dotted line shows the slow reaction of a market, which needs 30 days to incorporate totally the information. The last line represents an overreaction and subsequent reversion to the original price. Both lines show the direction of inefficient markets.

TAB 4. REACTION OF STOCK PRICE TO NEW INFORMATION IN EFFICIENT AND INEFFICIENT MARKETS[16]



Efficient market response: The price instantaneously adjusts to and fully reflects new information; there is no tendency for subsequent increases and decreases.

Slow response: The price adjusts slowly to the new information; 30 days elapse before the price completely reflects the new information.

Overreaction: The price overadjusts to the new information; there is a bubble in the price sequence.

So now it is clear why prices follow a random walk pattern in competitive markets. If past price information could be used to forecast future price changes, investors would be able to obtain high profits, but in competitive markets[17] it is not possible.

And if investors try to make use of past prices information, prices adjust istantaneously until it is no longer possible to analyse past price fluctuations. As a consequence, all past information is reflected in today's prices and changes will be independent from one period to the other. No one can expect to earn consistently higher returns in this type of market nor

[16] Mishkin, Eakins, *Financial Markets and Institutions,* Seventh Edition, p. 481

[17] A competitive market is a theoretical market structure where a large number of producers compete with each other to satisfy the needs and wants of a large number of consumers.

can hope to collect more information because all information is incorporated in today's stock prices.

There can be identified three levels of market efficiency on the basis of degree of information embedded in security prices. The *weak* form efficiency states that a past stock's movement is unrelated to its future movement so that it is not possible to make large profits. The *semistrong* form implies that prices adjust immediately to public information with the implication that mutual funds, that rely heavily on publicly available information, do not outperform market indexes. Then, the *strong* form states that both public and private information is incorporated in a stock's price and even insider trading cannot give an advantage, since exceeding normal profits cannot be realized regardless the amount of research or information available.

The most important rationale behind the Hypothesis relies on the concept of arbitrage, in which arbitrageurs cancel out unexploited profit opportunities. An important element for this reasoning is that not every investor in financial markets must be well informed about the price of a stock to be lead to the point at which the efficient market hypothesis holds. Since financial markets are composed of so many playing participants and as long as there will be few investors looking for unexploited profit opportunities, they will eliminate those opportunities due to the expectations of some profit.

1.2.1 EVIDENCE IN FAVOR OF THE EMH

I. Random walk behaviour of security prices. Stock prices seem to follow a random pattern, that is, future changes in prices are not predictable as they could fall or rise in the future. To test this theory, two types of tests are commonly used by economists: firstly, stock market records are examined to see if present changes in prices are associated with past changes and thus, could be anticipated on this basis; secondly, data are analysed to verify if publicly information could be used to forecast changes. From both type of tests, results confirmed the random walk of stock prices.
II. Performance of investment analysts and mutual funds. Evidence from the efficient hypothesis argues that it is not possible to make

abnormally higher profits from purchasing a security, implying that analysts and mutual funds are not able to beat the market. A basic test is taking buy and sell suggestions from a group of advisers or mutual funds and make comparisons between the portfolio of the stock chosen and the whole market. Evidence showed that advisers are not able to outperform the market, even those who successfully predicted past stock prices and also mutual funds do not beat the market. Some analyst resulted to be lucky and some unlucky while mutual funds that acted well in one period did not perform better in the second. This implies that having done well in the past does not necessarily mean that they will act in a good way in the future.

III. Technical analysis. It prescribes the study of past data on prices to look for common patterns and similar cycles between prices, in order to establish the rules for buying and selling securities on the basis of the results obtained. The EMH shows that technical analysis is not useful simply due to the fact that past price data are not able to predict future changes. Two tests are generally undertaken to support the EMH. The first works on the evaluation of the performance of analysts, with the same results described in point 2. The second applies the rules found through technical analysis to new data showing that it is not possible to beat the market.

IV. Stock prices reflect public available information. Given this assumption, a good news about a company will not increase the price of its securities because the news is already embedded in stock prices. Factual evidence proves it since, generally, stock prices do not rise due to favourable earnings announcements.

1.2.2 EVIDENCE AGAINST THE EMH

Almost without exceptions, early academics believed that the EMH represented loyalty the reality. In 1980, Grossman and Stiglitz published a research, arguing that markets do not work in equilibrium but in a ‘equilibrium disequilibrium’ since “prices reflect the information of informed individuals (arbitrageurs) but only partially, so that those who expend

resources to obtain information do receive compensation"[18].

Indeed, recent empirical evidence shows that the efficient market hypothesis may not hold in reality and may not be applicable.

I. January effect. This anomaly indicates that stock price seem to have abnormal rises on January, rises which are predictable and not in line with the random walk theory. For example, from 1928 through 2018, the S&P 500 increased by 62% in January[19]. Some explanations for this anomaly may be traced on tax issues, since investors engage in tax-loss accumulation and repurchases before the end of December in order to soften their tax liabilities. Another explanation may be the tendency of investors to put cash bonuses into the market to obtain higher profits and the belief that January is the best month to invest in a program. However, this theory is not consistent with the behaviour of pension funds, not liable for taxes, since they do not take advantage of higher returns on January.

II. Small firm effect. It can be defined as the behaviour of small firms to outrun the stock market. Many studies confirm this anomaly, such as the Korean stock market, where, between 1982 and 1988, small firms showed abnormally higher returns than larger firms[20].

III. Excessive volatility. It expresses how much an asset's price fluctuates around the mean, with the consequence that a high volatile stock may change unexpectedly over a short time period while a lower volatile stock turns to be more stable.

IV. Market overreaction. It is an impetuous response by investors to unexpected information, which leads stocks to be overbought or oversold[21]. This violates the EMH, since overreactions should not occur since intelligent investors may earn abnormally high profits by buying a security after a poor earnings announcements and selling it when it has gone back to its fundamental value. Empirical examples

[18] Grossman and Stiglitz, *On the Impossibility of Informationally Efficient Markets*, American Economic Review, 1980, p. 393

[19] www. Investopedia. Com

[20] Cheung, Leung, Wong, *Small Firm Effect: Evidence from Korean Stock Exchange*, Small Business Economics, 1994

[21] "Any event in which there is a price reaction followed by a correction (reversal) can be taken as evidence of overreaction […], more likely to occur when dramatic, unanticipated news enters the market". Howe, *Evidence on stock Market Overreaction,* Financial Analysts Journal, vol 42, n 4, 1986, pp 74-77

are bubbles and crushes.

V. Mean reversion. It is the conjecture that a security's price will tend to fluctuate around the average price over time. When the actual market price is lower than the average price, the security is deemed to be attractive for purchase, when the opposite, it is expected to fall. As a consequence, a positive change may be predictable, implying that stocks do not follow a random walk.

VI. Do investors react slowly to new announcements? Generally, security prices do not immediately adjust to new information but they continue to increase after an unexpected profitable announcement and fall after a low profit one.

2. PSYCHOLOGICAL FACTORS IN DECISION MAKING

2.1 BEHAVIORAL BIASES IN FINANCIAL DECISION MAKING

Investors prefer allocating their resources in outputs that yield the higher profits and, to maximise their payoffs, they have to bear an equivalent amount of risk. According to the theory of rationality, investors act rationally while taking decisions and considering their investments. But in the real world, elements from inefficiencies in the financial market hamper rational conducts and influence the decisions and actions of investors.

These elements are called behavioral biases, which are errors stemming from bad decisions and that may end in erroneous actions. Behavioral finance is the field that analyses the outcomes of these psychological deviations during investments' choices and their consequences on the markets, through the development of models that help analyse those behaviors of investors that rational theories fail in explaining and interpreting. Roughly speaking, behavioral finance makes the attempt to investigate financial actions and to what extent they influence security and market prices and profits through the application of sociology's and psychology's knowledge since it is essential to know why investors base their actions on emotions and social factors.

The behaviour of investors can be split into two subfields: major and minor financial behaviour. The former asks whether the behaviour of investors are influenced by emotional faults; the latter focuses to what extent the EMH is able to clarify the performances of financial markets and in which way market inefficiencies are demonstrated. An important focus is given to the perception, which is considered to be the drive of the cognitive biases: it is the process by which stimuli from the environment are stored and analysed. The primary cause of errors in investing is the misinterpretation of reality and since investors allocate most of their resources in the stock market, perceptual biases are linked to their way of deciding. Research has studied several behavioral biases influencing investors' behaviour.

2.1.1 OVERCONFIDENCE

It can be defined as an "inopportune belief toward a witnessed reasoning, judgment and the person's cognitive abilities"[22]. According to Daniel and Hirshleifer, overconfidence has an important role in financial decision making since it has been found that overconfident investors trade more than rational investors. This is due to the fact that the investor believes to know more information than the others and this leads him to be more positive about the future. Therefore, the investor is brought to buy higher priced securities and, as the inadequacy of good knowledge comes to surface, the price of the securities begins to decrease, resulting in a decrease in the overall prices of the stock market. Usually, the assumed overconfidence leads investors to invest in highly output securities and trade them at a lower price[23].

This could be caused by too much investing in the security market since overconfident investors are more keen on to trade high volume stocks, enhancing market depth and dampening the expected return of investors.

Glaser and Weber have found that overconfidence may be divided into three categories: over ranking, timing optimism, illusion of control and desirability effect[24]. Over ranking happens when an investor considers his own performance to be better than the others, in the illusion to be superior than the average. This misconception represents a big problem when investing since it usually influences investors to bear too much risk. Timing optimism, instead, is the overestimation of how faster things can be achieved and the underestimation of time that takes to accomplish a specific activity. In business and investing, investors sometimes may miscalculate how much time an investment will need before paying off. The illusion of control shows when it is thought to keep control of a circumstance; on average, people have the conviction to have full control of a situation when in reality it does not appear to be so. As a consequence,

[22] Zhu, Yang, *Ambiguity vs Risk: An Experimental Study of Overconfidence, Gender and Trading Activity,* Journal of Behavioral and Experimental Finance, p. 125-131, 2016

[23] Daniel, Hirshleifer, *Overconfident Investors, Predictable Returns, Excessive Trading,* Journal of Economic Perspectives, vol 9, n 4, 2015, p 61-68

[24] Glaser, Weber, *Overconfidence and Trading Volume*, Geneva Risk Insur Rev, 1-36, 2007

investors are lead to believe circumstances to be less risky than the reality, resulting in failures to calculate and manage adequately risk.

Then, the desirability effect occurs when investors consider an event to be more probable just because that is the outcome they desire to happen, overestimating important factors that may lead to a total different result (the so called “wishful thinking”).

2.1.2 AVAILABILITY HEURISTIC

The availability heuristic is a psychological bias that depends upon prompt examples, stemming from thoughts when people take into consideration a distinct situation, concept or model. It relies on the idea that if an event comes easily into mind, it must be more important than other situations that are not been evoked. As a consequence, people, and in specific investors, are lead to believe that recent information is more important when measuring their thoughts and therefore, they make the mistake to conclude that new judgments are not biased.

A famous study was the one conducted by Tversky and Kahneman, who found out that the correlation effects between the occurrence of two events could be the basis of people’s considerations. To demonstrate this theory, Tversky and Kahneman conducted a research among American undergraduates’ students, who were asked to read a list of 39 names (20 were the names of no famous men, 19 names of famous men, 20 of less well-known women and 19 of famous women). It was found that 66% of the participants responded better for famous names than less famous names, and only 15% recalled more frequently less famous names. This research confirmed that the “frequency of judgments were based on the ease with which names could be recalled”[25].

Recent research has determined that people are not trustworthy due to the fact that they consider easily recalled information to be more reliable and therefore they fail in analysing all available situations.

[25] Mckelvie, *The Availability Heuristic: Effects of Fame and Gender on the Estimated Frequency of Male and Female Names*, Journal of Social Psychology, 1997, 63-78, 1997

Availability heuristic has also an important part in the forecast and analysis of business cycles and economic growth since it is one of the primary factors that affect investments. Indeed, a misleading perception of market conditions may bring investors to consider negative trading opportunities as profitable, failing in assessing the right degree of risk and the right return on safe investments.

2.1.3 PROSPECT THEORY

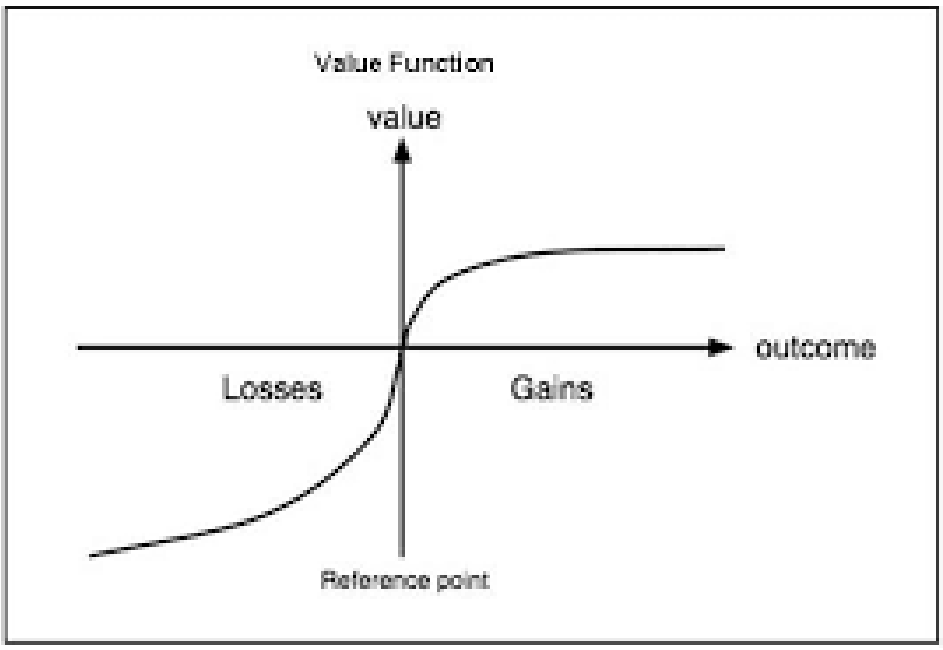
The Prospect theory, or Loss Aversion Theory, states that people consider losses and gains in different ways, basing their opinions on perceived gains and perceived losses. In other words, if two choices are available, one showed as a potential gain and the other as a potential loss, despite having the same outcome, the first choice will be taken. The basic idea under this bias is that the probabilities of gain and losses are perceived to be 50 and 50 instead of the true probability, meaning that the probability of a gain is usually considered higher.

The prospect theory was mainly used by Kanheman and Tversky to criticize the Expected Utility Theory, focusing on the assumption that people weigh their decisions with lower probabilities than the equivalent ones[26].

The table below shows the function associated with prospect theory: a function that is concave for gains (risk aversion), convex for losses (risk seeking) and steeper for losses than for gains (loss aversion).

[26] Tversky and Kahneman, *Advances in Prospect Theory; Cumulative Representation of Uncertainty,* Journal of Risk and Uncertainty, 1992, 397-323

TAB 5. PROSPECT THEORY[27]



The research of Tversky and Kahneman shows that a bigger emotional shock is caused by losses that a corresponding gain, therefore, given two choices in different ways but yielding the same outcome, the choice giving the perceived gains will be taken.
For example, suppose an investor is facing two choices, where the outcome in both is the gain of 20$. The first situation allows him to gain directly 20$, while in the second he obtains 40$ and then loses 20$. Although the outcome is the same, an investor will be more willing to choose the first option since a direct gain is seen as more profitable and favourable then bearing a loss in a second moment. Therefore, in investing, prospect theory has two implications. First, investors choose risk easier if they consider their investments less frequently. Second, when the returns will raise enough to outweigh losses, investors will choose more risk.

[27] www.Researchgate.com

2.1.4 ANCHORING

Anchoring is a behavioral bias consisting of a strong belief in an initial information given (called 'the anchor') while taking a decision. It takes place when an individual bases his future decisions through the anchor. An example may be the discounted price of goods. If one good is selling for 30$ and another one with original price of 50$ is selling for 30$, the second good will be chosen, since the original price is generally a benchmark for making purchases compared to its original value.

Similarly, in investing, investors often neglect collecting enough information due to the immense flow of news that overrun markets. Research has found that when an important data is available, investors make forecasts by starting from a first value then adapted to give the ultimate value. Anchoring leads investors often neglect good financial opportunities since they regard the initial price of stocks as anchors for looking at future security's prices.

As a consequence, they tend to maintain for too long investments that have lost their value, bearing too much risk and believing that the price of the stocks will go back to their fundamental value. Sometimes it may also happen the 'post-earning announcements phenomena': when the earnings of a firm are made public, the security price will react to the new information, going to a new intrinsic value and the original price will become an anchor for future decisions.

2.1.5 FRAMING

Framing indicates the behavior of those individuals that get influenced by the way in which decisions are presented. It is based on the concept that people react in different ways to new information depending upon the way it is given. In investing framing as several consequences. First of all, investors perceive differently the investments opportunities, whether they offer more gains or losses. The ultimate result of the two opportunities may be the same, but the choice taken will rely upon which choice has the better outcome[28].

[28] "Framing refers to the process by which people develop a particular conceptualization of an issue or reorient their thinking about an issue […]. An attitude

For example, an investor is facing two situations. The first presents a gain of 400$ during the year, but the investor will lose 200$ because of market volatility, while in the second situation the investor will gain 400$ and at the end he will possess 200$ of profits. The final result of both options is 200$ but the second situation will be preferred since it is framed to offer more gains than losses.

As a consequence, investors are led to react to investment opportunities in a wrong way and, although two situations may have the same outcome, they will accept choices framed as risky gains. Framing is also used by companies to deceive investors into determined schemes. For example, companies may alter some information to exalt their positives and this will lead investors to consider risky and unprofitable opportunities.

2.1.6 HERDING

Herding is a behavior that was initially found in animals and describes their trend of hunting in groups, looking for protections from predators and finding mates and food. This theory was then extended to human behavior, being studied mostly in the context of financial markets. Indeed, in markets several definitions of herding have been developed. For example, Bikchandani & Sharma have defined it when investors ignore their common beliefs and mimic their peers, while Nofsinger & Sias have observed herding when "a group of investors trades in the same direction over a period of time"[29].

There are two different types of herding: intentional and spurious (or unintentional). Intentional herding implies that the investors ignore their ideas and perceptions for following intentionally the actions of others. It arises mainly from unsophisticated investors who are not able to process information in a correct way and centre their actions around pseudo-signals,

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toward an object, in this view, is the weighted sum of a series of evaluative beliefs about that object. Specifically, Attitude = vi ∗ wi, where vi is the evaluation of the object on attribute i, and wi is the salience weight (wi = 1) associated with that attribute". Chong and Druckman, *Framing Theory,* Annu. Rev. Politic. Sci, 2007

[29] Nofsinger & Sias, 1999 (as cited in Chiang & Zheng, 2010, p.1911).

which are just noise. This is a typical behavior that occurs when investors behave in an environment where information is incorrect and misleading and, as a consequence, they look at the behavior of other participants. One incentive for intentional herding could be compensation concerns. Spurious herding, instead, occurs when investors make similar decisions because they get similar information. One possible cause is the exposure of investors to same market information which lead them to make unintentionally similar decisions.

In order to assess herding behavior, two methods are mainly used. One method implies the calculation of asset betas, which show significant persisting variance attributable to irrational behaviors, like herding. The method theorizes that the observed betas can be divided into several components: a ‘true’ equilibrium beta and some secondary elements, which are caused by irrationality. The other, instead, requests the observation of the dispersion of asset returns: during periods of high uncertainty returns on securities will be distributed more closely around overall market returns.

Indeed, herding is generally associated with periods of financial stress and turmoil, accompanied with uncertainty. Also oil price fluctuations are considered potential reasons for herding.

3. EVIDENCE FROM ASIA

A subsequent step in the study of behavioral biases of investors is the analysis of Asia, which reveals to be an interesting case study for behavioral finance, due to the different levels of capitalism and financial markets. Most of the emerging countries of this area, such as China, have been recently switching in the last decades from a social economy to a more capitalist one. Then, there are countries, such as Japan, that have had large and established economies since hundred years. For this reason, differences in knowledge and experiences have an important role in explaining differences in the behaviors of investors. Thus, the purpose of this analysis is to concentrate in particular in the case study of two specific countries, China and Russia and provide an explanation of their stocks' market efficiency.

3.1 CULTURAL DIFFERENCES

The research has found that Asians are affected more by cognitive biases than westerners, since there exist psychological and cultural differences between the two populations. According to Hofstede, differences from a cultural point of view are due to a dichotomy between individualism and collectivism. Indeed, Eastern populations tend to rely on a more collective reference model than Western people. Hofstede identifies these differences in five dimensions: power distance, uncertainty avoidance, individualism/ collectivism, masculinity/ femininity and long-/ short-term orientation[30].

In eastern cultures:

- Inequalities of power and wealth have been grown within the society, where a caste system does not allow changes for individuals;
- Family plays a central role in society, where close ties within members of the same group are enhanced and where everyone step in to help members of their family;
- High level of gender differentiation dominates culture with females being controlled by male dominance;
- There is low tolerance for uncertainty and ambiguity. Society is rule-

[30] Armstrong and Kotler, *Marketing: An Introduction,* Global Edition 11e, Pearson, 2013

oriented so that laws and regulations decrease uncertainty;
- Values of long-term obligations and respect for tradition are prescribed, with support of strong work principles and long-term payoffs.

As a consequence, Asians tend to have a different perception of risk and bear differently losses. For example, according to Yates et al.,the Chinese education system stimulates students to rely on traditions rather blame them, while the American system stimulates students to criticize others' and their own beliefs[31].

Several studies have been conducted to analyse the cognitive behavior of Asians investors. For instance, Chen et al. focus on the behavior of investors and their actions that could lead them to take bad investment decisions. In particular, it was found out that Chinese investors are more likely to suffer from overconfidence and disposition effect than American investors.
Instead, Tan et al. study herding in the Chinese markets. In China, there are mostly traded two types of shares: A shares, owned by Chinese investors, and B shares, owned by foreign investors. The research shows that herding is higher for A shares during periods of high boom market and high fluctuations while B shares do not highlight any herding behavior.
Lin et al. analyse Taiwanese market to study pecking order and managerial optimism and they found that Taiwanese managers are more likely to suffer from optimism because they believe their firms to be undervalued, preferring to raise capital in form of debt than equity[32].

3.2 CHINA CASE STUDY

As mentioned before, research has found that, through the collection of brokerage account data in China, Chinese investors are in general more likely to make poor investments: the securities purchased underperform those sold.

[31] Yates, Zhu, Ronis, Wang, *Probability Judgment Accuracy: China, Japan, Us,* Organizational Behavior and Human Decision Processes 43, 1445-171, 1989
[32] Lin, *Elucidating Rational Investment Decisions and Behavioral Biases: Evidence from the Taiwanese Market,* African Journal of business Management, 2011

Investors may also suffer from three cognitive distortions:

1) they tend to be subject to the disposition effect, since they appreciate more securities that have increased in price, paying more attention to the gains instead of losses;
2) they tend to be overconfident;
3) they suffer from the representativeness bias[33].

In general, investors with more experience are more likely to suffer from behavioral biases. More specifically, five criteria of investor experience have been evaluated: investors with more experience, younger investors, active investors, investors with more wealth and those who live in cosmopolitan Chinese cities.

The studies of Chen et al. have focused on trading performance of investors in China. The security market is relatively new and only in the last decades Chinese market has been opening to the rest of the world and, for this reason, Chinese investors are seen as having less experience that investors from western countries, like the Us. Most of the literature has been analysing the biases of the capitalistic economies, showing how western investors suffer from mental shortcuts, poor investment decisions and heuristic simplifications and, since the eastern investors are less familiar and experienced with certain investment processes, the mental shortcuts may be even stronger.

Data from 46,969 brokerage accounts were collected and four type of tests were conducted:

1) trading performance of investors was analysed through the collection of subsequent returns of securities sold;
2) it was determined to what extent Chinese investors were likely to hold poor securities and sell the well-performing ones;
3) it was examined the tendency of portfolio diversification, trading activity and risk in relation with overconfidence;
4) it was assessed the extent of representative bias, taking into account different characteristics of investors (age, wealth, activity).

[33] Chen, Kim, Nofsinger, Rui, *Behavior and Performance of Emerging Market Investors: Evidence from China*, October 2005

As mentioned in the previous chapters, investors may suffer from different types of cognitive biases, leading them toward predictable and non-optimal decisions. In the case of Chinese investors, they may undertake wrong decisions due to their lack of investing experience, even if has been shown that even experience and sophistication may not offset those biases. Instead, they are led to sell their well-performing securities and to invest in high risky stocks.

The Chinese security market consists of two stock markets, the Shenzhen Stock Exchange (SZSE) and the Shanghai Stock Exchange (SHSE), which were created in April 1991 and November 1990. The two markets regulate themselves and cross listing is not permitted. The exchanges are opened five days a week, from Monday to Friday and each market has two trading sessions: the morning session begins at 9:30 and ends at 11:30, while the afternoon one opens at 13:00 and closes at 15:00. The SZSE and SHSE have experienced high development in the last years and are among the biggest markets: there are about 1,250 listed firms with more than 500$ billion of total market capitalization; more than 100 brokerage companies and more than 70 million investors (even if it must be said that in proportion to the Chinese population, the number of investors is small with respect to the western countries)[34].

The study of Chen et al. takes into account 46,969 investor accounts, from May 20,1998 to September 30, 2002. During this time, data register 1,208,596 purchases and 1,091,848 sales, regarding investors' age, trading activities of buying and selling, the size of the account and the city in which it is allocated[35].

In order to calculate the returns, monthly returns data from China Stock Market & Accounting Research (CSMAR) has been used.

In order to show that Chinese investors make bad investment decisions, it

[34] www. Nasdaq.com

[35] There are two types of shares in China, A-shares and B-shares. The primary difference between the two share types is their ownership restrictions. A-shares are owned by Chinese citizens. Until February 28, 2001, B-shares were only owned by foreigners. As such, only A-shares are included in our dataset. There are 1,139 stocks in the data sample, including 502 A-shares traded on the Shenzhen exchange and 637 A-shares traded in Shanghai.

was examined the performance of securities bought and then sold. For example, consider the case in which an investor sells a security to buy another security. If the security bought is outperformed by the stock sold before, the investor would have benefited more by holding the first security. Thus, the investor made a non-profitable decision.

An average of successive returns of securities bought and sold were analysed and a total return of each security during 84 trading days, 252 trading days and 504 trading days was computed.

The panel A of table 7 indicates that the return for the security purchased was 3.59% and 5.57% for the 84 trading days, with a difference of -1,40%, significant at 1% level. For the other two periods of the series the difference in returns was -2.45% and -1,80%. These estimates indicate that in general, Chinese investors make poor investment decisions.

To investigate to what extent individual characteristics impact decisions, a regression was made into the difference of stocks' return, taking into account age, account value, trading and place of activity:

Purchase-Sales Return = α + $\beta 1$(*Account* Age) + $\beta 2$(|*40-Investor's* Age|) + $\beta 3$ (Frequent Trading Dummy) + $\beta 4$(*Account* Value) + $\beta 5$(*Urumuchi).*

In Panel B of the table the adjusted-R2 indicates that between 0.8 and 3.1% of variance accounts for the investors' characteristics.

A positive coefficient for account age, investor age and high trading demonstrate that:

1) Securities sold outperformed securities purchased the longer a brokerage account has been opened;
2) that experience seems to enhance better investment decisions;
3) high trading accounts are more efficient. Instead, the negative coefficients for account value and city mean that largest accounts are affected more by bad decisions and that investors in the city of Urumuchi (judged as the city with less experienced investors) face poor investment decisions.

3.2.1 DISPOSITION EFFECT

In order to assess the disposition effect, proportion of gains realized and proportion of losses realized are generally computed[36].

If PGR is greater than PLR, investors show tendencies to sell good securities more than losing ones. In panel A of table 8 are reported the estimates and their difference for all periods. PGR is 0.209 greater than PLR (significant at 1% level), meaning that Chinese investors are hesitant in incurring in losses. In panel B instead, there are reported the investors characteristics included in the regression.

The results advise that investors who trade often and who have larger accounts are less affected from disposition effect.

However, middle-aged investors and those from big cities are more likely to suffer from disposition effect. Overall, data suggest that Chinese investors are more inclined toward this bias[37].

[36] PGR= realized gains/ realized gains+ paper gains
PLR= realized losses/losses+ paper losses

[37] "To disentangle the multivariate effects of investors' personal characteristics, we re-estimate regression (1), but this time the dependent variable is PGR, PLR, or the difference (PGR-PLR). Panel B reports the coefficient estimates. The third regression, where PGR-PLR is the dependent variable, shows the disposition effect (i.e., the larger the difference, the greater is the individuals' disposition to sell winners and hold losers). The regression results suggest investors who trade often and investors who have larger accounts suffer *less* from a disposition effect. However, middle-aged investors and investors from cosmopolitan cities seem to suffer *more* from a disposition effect. Thus, the findings are mixed. We also conduct a logit regression as a robustness check. Feng and Seasholes (2005) show that PGR and PLR measures are mechanically linked to right hand side variables in cross- sectional analysis (specifically, see Feng and Seasholes' Appendix D). Therefore, as in Grinblatt and Keloharju (2001a), we use a logit regression where the dependent variable is equal to one (zero) if PGR is greater (less) than PLR. The fourth model in Table 3, Panel B, shows the logit regression results. From this model, we see that investors with older accounts suffer more from a disposition effect, while account size is not related to the disposition effect. Therefore, the findings from the logit model are more consistent than the third regression model in showing that those investors one might think are savvier are *not* the ones that are less inclined toward a disposition effect". Chen, Kim, Nofsinger, Rui, *Behavior and Performance of Emerging Market Investors: Evidence*

3.2.2 OVERCONFIDENCE

Panel A of table 9 discloses the mean number of securities in the accounts, the mean monthly turnover of each account and total mean monthly return of securities in each account. It can be argued that Chinese investors do not possess many securities on average and for this reason they appear to not diversify as well as western investors. They also seem to trade frequently: the mean monthly turnover is 27.3% or 327% in annual terms, four times greater than American investors, who trade at a rate of 7,59% or 91% annually.
This could be due to the lack of investment vehicles in China. Again, investors' characteristics, number of stocks, returns and turnovers, have been included in the regression, as seen in panel B. It can be noted that investors with older accounts own fewer stocks, have high turnover and higher returns, while young investors trade more than older ones (showing an overconfidence trend). Investors that invest very often possess 1.9 more securities and earn 0.5% more per month. Larger accounts are more diversified in terms of securities, trade less and earn a lower return (they exhibit the least overconfidence).

3.2.3 REPRESENTATIVENESS HEURISTIC

Table 10 describes the past returns for the securities purchased in the pre four-month return, pre four-month abnormal return, pre one-month return and pre one-year abnormal return (calculated as actual returns minus expected returns).

In panel A it can be noted that in general investors purchased past winning securities. The return for the four month was greater than 17%, 32% abnormal returns, while for the one-year returns were 2.9%, 0.4% abnormal returns. It seems that investors look more for recent performance of their securities.

Including investors' characteristics in the regression, as shown in panel B, it is evident that investors with longer accounts and middle-aged investors

from China, October 2005

are less myopic. However, individuals who trade more and have larger accounts show a higher propensity to buy past stock. Investors from Urumuchi tend to focus more on past one-year security, suggesting that they are less myopic.

3.2.4 CONCLUSION

The empirical results showed that Chinese investors make investment errors (they sell securities that outperform the securities bought), they are hesitant in incurring in losses (disposition effect), they are often overconfident (they trade very often) and they suffer from representativeness bias (they buy new short-term securities). From the regressions, it was found that investors who are middle-aged, active, wealthier, experienced and live in cosmopolitan cities are less likely to incur in cognitive biases. However, they are often unable to overcome those errors.

3.2.5 DATA[38]

TAB 6. DESCRIPTIVE STATISTICS ON BROKERAGE ACCOUNTS AND TRADES

The table below discloses the statistics of the brokerage accounts and buying/ selling trades during the period May 20, 1998/ September 30, 2002 of a Chinese investor. Further difference in the data comes from opening of the account (less than 3 years or more than 3 years), from the age of the investor, from the frequency of trading and from the city of the account's location.

	Number of accounts	Mean value value of accounts	Mean yrs. account is open	Number of purchases	Number of sells	Mean transaction volume
All accounts	46,969	113,455	3.33	1,308,596	1,091,848	2,538.04
By account age:						
Open < 3 years	16,789	135,132	1.65	298,422	230,506	2,899.36
Open ≥ 3 years	19,984	116,874	4.74	689,128	587,867	2,553.56
By age of investor:						
18-28 years old	4,682	121,265	2.31	89,553	75,314	2,283.77
29-49 years old	31,391	101,272	3.49	857,417	717,814	2,515.53
50-75 years old	2,437	73,765	3.38	76,322	62,743	1,965.39
By trading activity:						
Frequent trading	4,694	224,959	4.18	639,578	572,459	2,762.58
Infrequent trading	42,275	101,075	3.24	669,018	519,389	2,309.04
By account value:						
Small	15,656	7,023	3.07	200,783	177,167	616.07
Medium	15,657	25,612	3.36	369,631	307,735	1,051.37
Large	15,656	307,737	3.57	738,182	606,946	3,826.72
By city:						
Wuhan	4,772	66,365	2.50	146,197	123,604	2,050.86
Urumuchi	12,327	56,001	3.08	242,174	197,112	1,518.21
Futian (Shenzhen)	5,271	313,712	3.07	156,788	135,211	5,675.71
Shekou (Shenzhen)	11,991	101,455	4.59	394,261	337,092	2,604.26
Shanghai	8,175	108,903	3.28	257,334	210,265	1,926.79
Pudong (Shanghai)	4,433	126,656	2.52	111,842	88,564	2,042.23

[38] Tables and caption from Chen, Kim, Nofsinger, Rui, *Behavior and performance of emerging markets investors: Evidence from China,* 2005, p. 25,26,27,28

TAB 7. TRADING PERFORMANCE

Panel A indicates the subsequent returns of stocks for three periods: four-month period (504 trading days), one-year period (252 trading days) and two-year period (504 trading days).

Panel B reports the coefficient of the regression equation:

Purchase – Sales = α + $\beta 1$(*Account* Age) + $\beta 2$(*40–Investor's* Age|) + $\beta 3$ (Frequent Trading Dummy) + $\beta 4$(*Account* Value) + $\beta 5$(*Urumuchi).*

The *t-statistics* are reported in parentheses and the symbols ***, **, and * denote statistical significance at the 1, 5 and 10 % levels.

Panel A: Univariate results

	4-month returns	1-year returns	2-year returns
Purchases	0.0359	0.1124	0.1064
Sales	0.0557	0.1371	0.1243
Purchase - Sales	-0.0140*** (-182.58)	-0.0245*** (-90.49)	-0.0180*** (-41.87)

Panel B: Regression results

	Dependent variable: (Purchase – Sales) for:		
	4-month returns	1-year returns	2-year returns
Intercept	-0.0060** (-2.50)	-0.0548*** (-17.83)	-0.2131*** (-36.42)
Account Age	0.0038*** (11.00)	0.0052*** (11.82)	0.0181*** (21.58)
| 40 – Investor's Age |	0.0002 (1.37)	0.0007*** (3.49)	0.0009** (2.27)
Frequent Trading Dummy	0.0031 (1.41)	0.0312*** (10.98)	0.0560*** (10.34)
Account Value	-0.0059*** (-6.34)	-0.0036*** (-3.10)	-0.0039* (-1.76)
Urumuchi	-0.0036** (-2.09)	-0.0058*** (-2.56)	-0.0104** (-2.46)
Adjusted R^2	0.0081	0.0147	0.0314

TAB 8. THE DISPOSITION EFFECT

Panel A indicates the mean proportion of gains and losses for transactions in 46, 969 brokerage accounts from the period May 20, 1998 to September 30, 2002. PLR is the ratio of realized losses to the sum of realized losses and paper losses and it is also reported the difference between PGR and PLR.

Panel B accounts for the following regression:

Dependent Variable = α + $\beta 1$(*Account* Age) + $\beta 2$(*40–Investor's* Age) + $\beta 3$ (Frequent Trading Dummy) + $\beta 4$(*Account* Value) + $\beta 5$(*Urumuchi).*

As before, the symbols ***, **, and * indicate statistical significance at the 1, 5 and 10% levels.

Panel A: Univariate results

	PGR	PLR	PGR – PLR (t-stat)
All Accounts	0.5190	0.3098	0.2092*** (82.60)

Panel B: Results results

	Dependent variable:			
	PGR	PLR	PGR–PLR	=1 if PGR>PLR
Intercept	0.7007*** (134.40)	0.4662*** (78.01)	0.2345*** (37.79)	0.1213*** (6.92)
Account Age	-0.0271*** (-15.42)	-0.0301*** (-14.95)	0.0030 (1.44)	0.0319*** (4.18)
| 40 - Investor Age |	-0.0016*** (-13.52)	-0.0010*** (-7.52)	-0.0005*** (-4.12)	-0.0044**** (-16.55)
Frequent Trading Dummy	-0.0747*** (-14.16)	0.0061 (1.01)	-0.0808*** (-12.88)	-0.9509*** (-36.34)
Account Value	-0.0864*** (-41.94)	-0.0771*** (-32.65)	-0.0092*** (-3.78)	-0.0146 (0.64)
Urumuchi	0.0080* (1.96)	0.0316*** (6.74)	-0.0236*** (-4.84)	-0.1063*** (-8.63)
Adjusted R^2	0.1297	0.0726	0.0117	

TAB 9. OVERCONFIDENCE

Panel A indicates the average number of securities held in each account, the mean monthly turnover, and the mean monthly returns for the accounts (all three estimates can be included in the dependent variable of the regression).

Panel B accounts for the following regression:

Dependent Variable = α + $\beta 1$(*Account* Age) + $\beta 2$(|*40–Investor's* Age|) + $\beta 3$ (Frequent Trading Dummy) + $\beta 4$(*Account* Value) + $\beta 5$(*Urumuchi).*

Account Age is the number of years the account has been open, the second variable is the absolute value of age of an investor, Frequent Trading Dummy is a dummy variable for those accounts in the top 10%, Account Value is the value of the account in terms of equity and Urumuchi indicates the city where the accounts are held.

Panel A: Univariate results

	Mean # of stocks owned	Mean monthly turnover	Mean monthly returns
All accounts	2.60	0.2731	0.0042

Panel B: Regression results

	Dependent variable:		
	Mean # of stocks owned	Mean monthly turnover	Mean monthly returns
Intercept	1.4847***	0.2312***	-0.0062***
	(56.18)	(122.26)	(-15.05)
Account Age	-0.0023	0.0104***	0.0026***
	(-0.58)	(35.71)	(41.60)
| 40 – Investor's Age |	0.0007	0.0007***	0.0000
	(0.39)	(5.29)	(0.52)
Frequent Trading Dummy	1.9291***	0.0616***	0.0055***
	(61.53)	(27.49)	(11.16)
Account Value	0.8714***	-0.0093***	-0.0006***
	(78.44)	(-11.81)	(-3.81)
Urumuchi	0.0026	-0.0043***	-0.0001
	(0.12)	(-2.90)	(-0.54)
Adjusted R^2	0.3016	0.0711	0.0636

TAB 10. PAST PERFORMANCE OF STOCKS PURCHASED

Panel A indicates past returns and past abnormal returns of Chinese brokerage accounts during the period mentioned before. It is also reported the mean return for the 4-month period and the 1-year period before the purchase of securities (both values are included in the dependent variable). Panel B accounts for the regression:

Past Performance = *α* + *β1(Account* Age) + *β2(|40–Investor's* Age|) + *β3* (Frequent Trading Dummy) + *β4(Account* Value) + *β5(Urumuchi).*

Panel A: Univariate results

	Past 4-month returns	Past 4-month abnormal returns	Past 1-year returns	Past 1-year abnormal returns
All accounts	0.1722	0.3250	0.0286	0.0043

Panel B: Regression results

	Dependent variable:	
	Past 4-month abnormal returns	Past 1-year abnormal returns
Intercept	-0.0149***	-0.0993***
	(-8.59)	(-37.48)
Account Age	-0.0023***	-0.0034***
	(-8.79)	(-8.50)
| 40 - Investor Age |	0.0007***	0.0010***
	(5.64)	(5.52)
Frequent Trading Dummy	0.0036	0.0128***
	(1.84)	(4.28)
Account Value	0.0087***	0.0192***
	(12.14)	(17.51)
Urumuchi	-0.0018	0.0089***
	(-1.34)	(4.29)
Adjusted R^2	0.0094	0.0155

3.3 RUSSIA CASE STUDY

After the fall of the Soviet Union, in 1992, Russia started the conversion from an economy focused on the nationalization of businesses toward a capitalistic-oriented economy, with the result of a deep change in the economic structure. Russia is the largest country for land mass, the 9th largest country in terms of population with 139 million people and the 8th largest economy in terms of purchasing power[39]. It is also the largest producer and exporter of oil and natural gas. For this reason, due to its size and importance in the global economy, it is essential for Russia an efficient security market to attract foreign investors and increase economic growth. Indeed, the economic development is deeply affected by the Russian security market, through processes for the allocation of resources between different sectors of the economy.

In the last decades there has been also a quick increase in foreign investments and the stock market has experienced a growing number of foreign investors, showing increasing development and importance. Nonetheless, the Russian security market has not been analysed in depth by researchers.

The stock market is composed by two principal stock exchanges: The Moscow Central Stock Exchange (MCSE) and the Moscow International Stock Exchange (MISE) and a number of minor exchanges. The exchanges are regulated by two main bodies, instituted in 1994, the Central Depository Clearing Body and the Russian Federation Commission on Securities and Capital Markets (FCSM). Moreover, the Russian trading system (RTS) is an electronic trading system created in 1995 to consolidate the regional stock markets where participants are able to use one or more web-sites, announce quotes, be updated on the situation of the stock markets, strike deals and conclude trades online. The RTS lists more than 400 securities, with more than 50 bonds deriving from foreign investors; it is calculated every 30 minutes with real-time prices and, since 2000, it is considered the largest stock exchange in Russia [40].

[39] www.history.com
[40] www.rts.ru.

3.3.1 EFFICIENCY OF THE RUSSIAN STOCK MARKET

As mentioned above, although the Russian market plays an important role in global economies, little research has been done regarding its efficient allocation of capital and stocks. In this case, it will be mentioned the research of Abrosimova et al., which tries to analyse the efficiency of the Russian security market considering the sample period between 1th September 1995 to 1th March 2001. In particular, the study is focused on daily, weekly and monthly RTS trading indices (its lists include the largest and most liquid Russian companies and it is relatively stable compared to variations of securities prices). To establish the predictability of the indices, the null hypothesis of a random walk theory has been tested and unit root tests, autocorrelation tests and variance tests have been performed.

The methodology used by researches relies on the idea that non stationarity is necessary for assessing the stocks' random walk, the non-stationary indices are then divided into trend stationary and difference stationary. If a time index is trend stationary, its pattern is predictable and non-consistent with weak form efficiency theory. On the other hand, if an index is difference stationary, unit root tests and autocorrelation tests are conducted on daily, weekly and monthly RTS data[41].

From the results of the research, it has been shown that the RTS index is difference stationary, implying the application of autocorrelation and variance ratio tests[42]. The former highlighted that the Random Walk did not

[41] More specifically, Unit root tests: "the RTS index series are tested for the presence of unit roots using the Dickey- Fuller and augmented Dickey-Fuller and Philipps-Perron Tests (…). The null hypothesis cannot be rejected at 95 and 99% confidence intervals. Conclusion: the null hypothesis cannot be rejected at the 95% and 99% confidence levels. Since both alternative hypotheses are not accepted, we conclude that the RTS Index series are Difference Stationary. Since the presence of a unit root is a necessary but not a sufficient condition for a random walk process, we proceed to the autocorrelation tests". Abrosimova, Dissanaike, Linowski, *Testing the Weak Form Efficiency of the Russian Stock Market,* 2002

[42] "Autocorrelation analysis is performed for 30 lags of daily and weekly RTS returns (…). *Conclusion:* On the basis of autocorrelation tests, the null hypothesis of the random walk cannot be accepted for daily and weekly returns. However, we cannot reject the null hypothesis for the monthly returns. Variance ratio tests are conducted for two null hypotheses: the random walk (with a drift) with homoscedastic increments and the random walk (with a drift) with heteroscedastic increments. For each null

apply to daily and weekly data indices, whereas the monthly data seemed to follow a predictable trend.

To conclude, the research did not have success in showing any weak-form inefficiency using daily, weekly and monthly returns. This could be due to the fact that the RTS index comprises the largest and most liquid securities of investors or that longer time data might be more efficient in identifying market inefficiencies.

Another study worth mentioning is the one conducted by Said and Harper, who tested the efficiency of the Russian security market. The daily index returns from July 2003 to December 2012 have been analysed in order to test the random walk theory and efficiency of the security market. As for the previous research, autocorrelation and variance tests have been used. If important auto-correlations are found in the data, security returns may not follow a predictable pattern and the market would be considered as inefficient in the weak form, whereas, if the random theory applies, investors would not be able to forecast future returns and the market would be efficient.

The results of the autocorrelation and variance ratio tests show that the Russian security market is not efficient in the weak form during that period, implying that investors may be able to obtain abnormal high returns by

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hypothesis, variance ratios are computed for 30 lags of daily and weekly data and for 15 lags of monthly data (…). Variance ratio tests are conducted for two null hypotheses: the random walk (with a drift) with homoscedastic increments and the random walk (with a drift) with heteroscedastic increments (…). The null hypothesis is accepted if the variance ratio is not significantly different from one. The test statistic has a standard normal distribution asymptotically (…) *Conclusion:* we cannot accept both null hypotheses of the random walk with homoscedastic / heteroscedastic increments for daily and weekly data; we cannot reject the null hypothesis of the random walk with heteroscedastic increments for monthly data. On the basis of all the performed tests, the null hypothesis of the random walk cannot be rejected for monthly data. Therefore, we do not proceed further in our analysis of monthly returns. However, the null hypothesis cannot be accepted for daily and weekly data. It means that these data may follow some predictable patterns". Abrosimova, Dissanaike, Linowski, *Testing the Weak Form Efficiency of the Russian Stock Market,* 2002

forecasting future price trends on the basis of past security data[43].

3.3.2 HERDING

Research has found that Russian investors tend to suffer from a particular behavioral bias, herding behavior. Indars and Savin's studies have been mainly done to examine herding toward markets, to what extent it is embedded in Russian investors and which are the potential factors leading to its emergence.

In general, it believed that herding has an easy grip on the Russian markets for some reason. First of all, Russia has seen a period of sever political and economic challenges in the last decades, which could have caused investors' uncertainty; even if it is one of the world's biggest country, it is believed that the Russian market offers little protection to investors and that information asymmetries dominates. To analyse herding in the case of the Moscow Exchange, it has been studied the relationship between market returns and dispersion of individual assets returns for the period April 4, 2008 to December 30, 2015. The empirical evidence has shown that there is a regular herding behavior in the exchange, particularly in the days of negative returns, extreme upwards oil price movements and periods of turmoil (financial crisis of 2008 and annexation of Crimea in 2014). The data demonstrate also evidence of spurious herding in the days of important macroeconomic new releases, sanctions and high-liquidity days. As mentioned before, data have been extracted on individually adjusted stock prices, market capitalization, book to market ratio, trading volumes and number of shares outstanding in the Moscow exchange. Also oil prices have been included. Having done so, the dataset obtained includes 1842 daily observations, with 120 companies, being the 85.7% of tot market capitalization of the exchange[44].

For what concerns the data about the macroeconomic announcements, such as unemployment rate, changes in interest rates etc., the news have

[43] Said, Harper, *The Efficiency of the Russian Stock Market: A Revisit of the Random Walk,* Academy of Accounting and Financial Studies Journal, Vol. 19, 2015. In Table 11 and 12 are reported the empirical findings in specific. See 3.3.3

[44] Edgars Indars, Aliaksei Savin, *Herding Behavior in an Emerging Market: Evidence from Moscow Exchange,* SSE Riga Student Research Papers, 2017

been collected from the Central Bank of the Russian Federation. The extent of the dataset allows to analyse herding in the context of three important events from an economic and political point of view: the Subprime crisis of 2008, the Russian crisis of 2014 and the annexation of Crimea, which led to severe sanctions[45]. The first event has been regarded as the most severe period, as seen in figure 13, where from 15 May to 30th December the weighted composite index of 50 Russian securities collapsed by more than 50%. This period includes also the worst events in the Russian market: the conflict between Russia and Georgia in august 2008 and November 10-14th, when the security market showed the worst decline among all world's financial markets.

[45] "In order to trace herding, Chang et al. (2000) propose to use cross-sectional absolute deviation of returns (CSAD):

$$CSAD_t = \frac{1}{N}\sum_{i=1}^{N} |R_i - R_m|$$

(…) Using this dataset, the authors create an equally-weighted market portfolio and rebalance it to account for changes in portfolio composition. We then calculate CSAD for the whole sample, as specified in Equation 1. This allows to set up the basis of the model for testing herd behaviour in Moscow Exchange. The authors then divide companies in the sample into quartiles based on the following criteria: number of analysts following a company and market capitalization. Thus, we additionally obtain two sets of portfolios, for which we calculate CSAD. Edgars Indars, Aliaksei Savin, *Herding Behavior in an Emerging Market: Evidence from Moscow Exchange,* SSE Riga Student Research Papers, 2017

TAB 11. MICEX INDEX[46]

Dynamics of MICEX Index, a value-weighted composite index calculated based comprised of the 50 most liquid Russian stocks. The second event, instead, which goes from 20 of February 2014 to 18th March 2014, with the sign of the Treaty, shows an increase by 10.8%. The period after is seen as the beginning of the Russian crisis, enhanced by sanctions and high uncertainty.

Researches have tried to investigate five main areas of correlation between herding and markets: overall market-wide herding, herding and calendar effects, herding and information environment, herding and liquidity, herding and oil price fluctuations.

For the purpose of this analysis, there will be reported only the results of all the regressions. The summary of the results is presented in table 14. There is found irrational herding during bad-days announcements, Subprime Crisis, Crimea annexations and days of macroeconomic news. Spurious herding is observed during days of high liquidity, macroeconomic announcements and sanctions. Another observation may be that small stocks with fewer analysts might be more likely to suffer from herding.

The findings on the securities traded in the Moscow Exchange show that the market manifests traces of irrational market-wide herding behavior over the whole period from 1th April 2008 to 30th December 2015. The results

[46] www.tradingeconomics.com

are consistent with the general trend of emerging countries like China and Taiwan in opposition to the developed countries such as US. This could reflect the fact that Russia cannot yet be compared to the well-developed and largest economies (US, UK) where herding is just a periodic phenomenon. Moreover, overall herding behaviour of the security market may reflect the actions of Russian investors, who are more likely to mimic each other in bad days' announcements. This could be the sign of the fact that bad days reflect periods of crisis where the market prices tend to fall suddenly, since these are times of high uncertainty and investors try to get information about future prices by following the market.

As mentioned before, there was found a herding behavior associated with periods of high uncertainty, especially during the subprime crisis and battle of Crimea. Little evidence, instead, is traced during the Russian crisis of 2014-2015. Those events above triggered unexpected events and repercussion in the markets, where investors, who could not rely on trustworthy information, tried to infer it from the market, causing herding. For example, as Crimea annexation revealed, investors reacted immediately by retreating from Russian equity funds. On the other hand, in the case of the crisis of 2014-2015, uncertainty did not cause markets crush since it could have been anticipated by investors after the annexation of Crimea. The evidence of spurious herding in that period may suggest that there could be fundamental factors driving herding during. This could happen during days of sanction announcements, which could lead to changes in fundamental information at companies' and markets' level. Indeed, as new information becomes public, it is accessible by all investors, who make investments and analysis in a similar way. Similarly, to bans, investors' expectations on markets and economy are influenced by macroeconomic announcements (GDP growth, unemployment…) and, indeed, there is evidence of spurious herding also during these periods. It is notable that relevant irrational market-wide herding is common, due to unsophisticated investors, who are not able to process and analyse information correctly.

For the correlation between oil price fluctuations and herding, there are no signs of relevant herding behavior during extreme-up movements, which range from 5% to 1%. This could be due always because of unsophisticated investors may misinterpret positive price announcements, seeing them as profits' opportunities. Instead, for extreme negative oil price fluctuations, no

relevant herding has been found, since the Russian oil companies are largely controlled and supported by the government and, for this reason, price shocks do not cause them too much damage.

3.3.3 CONCLUSION

To sum up all the findings, it can be assessed that herding behavior is common in the Russian security market and it mainly occurs during the days of negative market returns. The evidence suggests that irrational herding in Russia is correlated during periods of market turmoil which increases uncertainty, macroeconomic announcements and extreme upward oil price fluctuations while spurious herding is pronounced during days of sanction announcements, macroeconomic announcements and high-liquidity days.

3.3.4 DATA[47]

TAB 12. AUTOCORRELATIONS SERIES: RUSSIAN STOCK MARKET

There are 16 periods analysed by the the auto-correlation test. The first period indicates an auto-correlation of .135, a standard error of .020 and a value of 45.178, with 99% of significance, meaning that the security returns of the RTS do not seem to follow a random walk trend. The periods 3, 5, 8, 9, 10 and 15 have all negative auto-correlations with a P-value of .000, with 99% significance (…).

	Autocorrelation	Std. Error[a]	Value	df	Sig.[b]
1	.135	.020	45.178	1	.000
2	.012	.020	45.549	2	.000
3	-.039	.020	49.346	3	.000
4	.021	.020	50.484	4	.000
5	-.002	.020	50.496	5	.000
6	.014	.020	50.955	6	.000
7	.020	.020	51.911	7	.000
8	-.062	.020	61.514	8	.000
9	-.019	.020	62.419	9	.000
10	-.012	.020	62.771	10	.000
11	.033	.020	65.457	11	.000
12	.021	.020	66.523	12	.000
13	.063	.020	76.286	13	.000
14	.032	.020	78.896	14	.000
15	-.011	.020	79.175	15	.000
16	.031	.020	81.619	16	.000

a. The underlying process assumed is independence (white noise).
b. Based on the asymptotic chi-square approximation.

[47] From the study *Efficiency of the Russian Stock Market,* p. 46-47
From the Study *Herding behavior,* p. 29

TAB 13. VARIANCE RATIO TEST

The table is divided into two parts. The first component of the table displays the joint test while the second part of the table shows the individual tests. Since the P-value is significant it can be concluded that the Russian Trading System Index does not follow a random walk and can be classified as a weak form inefficient. The second part of the table displays the individual tests for different periods. As seen all periods are significant and it can also be concluded that the Russian Trading System Index is a weak form inefficient. The bottom part of the table shows the output for the variance ratio calculations of the mean, individual variance and the observations associated with each calculation.

Joint Tests	Value	df	Probability
Max |z| (at period 2)*	5.888503	2481	0.0000
Wald (Chi-Square)	35.33646	4	0.0000

Individual Tests

Period	Var. Ratio	Std. Error	z-Statistic	Probability
2	1.118220	0.020076	5.888503	0.0000
4	1.166780	0.037560	4.440400	0.0000
8	1.205107	0.059387	3.453735	0.0006
16	1.214950	0.088371	2.432367	0.0150

*Probability approximation using studentized maximum modulus with parameter value 4 and infinite degrees of freedom

Test Details (Mean = 0.000574248673672)

Period	Variance	Var. Ratio	Obs.
1	0.00051	--	2481
2	0.00057	1.11822	2480
4	0.00059	1.16678	2478
8	0.00061	1.20511	2474
16	0.00062	1.21495	2466

TAB 14. SUMMARY OF EMPIRICAL RESULTS

	Total herding (CSAD)	Spurious herding ($CSAD_{FUND}$)	Irrational herding ($CSAD_{NON-FUND}$)
Overall	No	No	Yes
Up-days	No	No	No
Down-days	No	No	Yes
Subprime crisis	Yes	No	Yes
Crimea annexation	Yes	No	Yes
Russian crisis	No	No	No
Sanctions announcements	No	Yes	No
Macroeconomic announcements	Yes	Yes	Yes
Companies with least analysts	No	No	Yes (portfolio 2)
Companies with most analysts	No	No	No
Smaller companies	No	No	Yes (portfolio 2)
Larger companies	No	No	No
Low liquidity (Amihud measure)	No	No	No
High liquidity (Amihud measure)	Yes	Yes	No
Low liquidity (Volume measure)	No	No	No
High liquidity (Volume measure)	No	Yes	No
Oil price extreme up	No	No	Yes
Oil price extreme down	No	No	No

CONCLUSION

The purpose of this thesis is to provide an explanation of the various cognitive errors of investors and find their empirical application.
The first part was dedicated to the analysis of some financial decision methodologies of investors, including the models for assessing a security price: The Capital Asset Pricing Model (theorized by Sharp, Lintner and Treynor), which represents the link between systematic risk and expected return for stocks and the Arbitrage Pricing Theory (theorized by Ross), which focuses on the link between returns, macroeconomic factors and elements unique to companies.
Then the Efficient Market Hypothesis is taken into account. It states that prices of stocks in financial markets reflect all publicly available information so that one investment is good as any other for investors because the prices already incorporate all information and arbitrage possibilities are not allowed.
According to this model, investors all act rationally to maximize their returns: they have all the information available and all the models to estimate risks and returns. To be successful in the markets, it is necessary to behave according to rational patterns and overcome wrong behaviors.
Modern financial theory, instead, suggests something different, so that investors are not always able to act in a rational manner when investing but they face many cognitive and psychological biases.
Among many biases, some are those in which this thesis is focused. First of all, overconfidence occurs when the investor believes to know more information than the others and so, he is led to invest in highly output securities and trade them at a lower price.
Second, the availability heuristic leads investors to have a misleading perception of market conditions so that they consider negative investing opportunities as profitable.
Third, according to the prospect theory, investors choose risk easier if they consider their investments less frequently and when the returns will increase to the point that they outweigh the losses, investors will choose more risk.
Fourth, due to the anchoring effect, investors often neglect collecting enough information due to the immense flow of information in the markets and, consequently, investors often refuse to take good financial opportunities.

Fifth, as a consequence of the framing theory, investors react to investment opportunities in a wrong manner and they are willing to accept choices framed as risky gains, even if two events have the same outcome.
Sixth, herding prescribes that investors that operate in a misleading environment look at the actions of other participants. Herding can be spurious or intentional: intentional when investors intentionally follow the actions of others and spurious when investors take similar decisions due to similar information.
Then, in the third part of the thesis these behavioral biases are applied to two case studies, China and Russia (Eastern markets have been chosen due to the different levels of capitalism, financial markets and culture with respect to the Western economies).
In the case of China, Chen at el. found that investors are more likely to suffer from the disposition effect, overconfidence and representativeness bias as the empirical evidence demonstrates that: Chinese investors tend to sell stocks that outperform the ones bought, they are hesitant in incurring in losses, trade very often and buy short-term securities. In particular, the study suggests that Chinese investors seem to have less experience than western investors (46, 969 brokerage accounts were analysed).
In the case of Russia, Indars and Savin found that herding is a common behavior in markets due to some political and economic circumstances. Through data from the period April 4, 2008 to December 30, 2015 it has been possible to show that regular herding behavior occurs in the days of negative returns, extreme upward oil price movements and periods of turmoil. Moreover, irrational herding is linked to small companies while spurious herding is correlated to days of sanction announcements, macroeconomic releases and high-liquidity days.

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