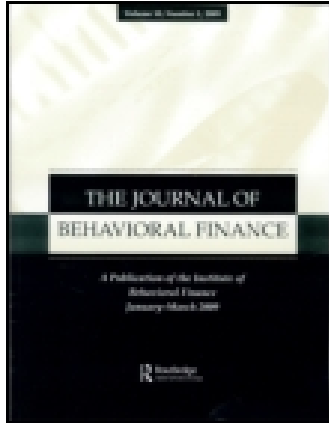


This article was downloaded by: [95.125.40.163]

On: 18 December 2014, At: 15:22

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of Behavioral Finance

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/hbhf20>

Behavioral Finance in Joseph de la Vega's Confusion de Confusiones

Teresa Corzo^a, Margarita Prat^a & Esther Vaquero^a

^a Universidad Pontificia Comillas

Published online: 02 Dec 2014.



[Click for updates](#)

To cite this article: Teresa Corzo, Margarita Prat & Esther Vaquero (2014) Behavioral Finance in Joseph de la Vega's Confusion de Confusiones, *Journal of Behavioral Finance*, 15:4, 341-350, DOI: [10.1080/15427560.2014.968722](https://doi.org/10.1080/15427560.2014.968722)

To link to this article: <http://dx.doi.org/10.1080/15427560.2014.968722>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Versions of published Taylor & Francis and Routledge Open articles and Taylor & Francis and Routledge Open Select articles posted to institutional or subject repositories or any other third-party website are without warranty from Taylor & Francis of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. Any opinions and views expressed in this article are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor & Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

It is essential that you check the license status of any given Open and Open Select article to confirm conditions of access and use.

Behavioral Finance in Joseph de la Vega's Confusion de Confusiones

Teresa Corzo, Margarita Prat, and Esther Vaquero

Universidad Pontificia Comillas

In this paper, we link Joseph de la Vega's work *Confusion de Confusiones*, written in 1688, with current behavioral finance and propose that Vega be considered the first precursor of modern behavioral finance. In addition to describing excessive trading, overreaction and underreaction, and the disposition effect, Vega vividly portrays how investors behaved 300 years ago and includes interesting documentation on investor biases, such as herding, overconfidence, and regret aversion.

Keywords: Behavioral finance, Investor biases, Stock market history, Overconfidence, Herding, Regret aversion

INTRODUCTION

Research on behavioral finance has seen explosive growth in the last 30 years. However, we can trace evidence of behavioral finance in writings before this period. In this paper, we claim that the work *Confusion de Confusiones* (hereafter CC), written by Joseph de la Vega in 1688, is the first study we have a record of that documents investor biases and thus is a clear precursor of the current behavioral finance literature.

Joseph de la Vega's work has been widely studied from different points of view. He wrote about diverse subjects, primarily philosophy and poetry. His active commercial life began in Amsterdam in 1683. CC was a consequence of his financial experience. This is the first and oldest book about the stock exchange and even today is a good description of financial transactions.

As with every first book of its class, some authors (Neal [1983]) have conferred on it great importance in the constitution and operations of other markets, such as the London Stock Exchange. This work has been studied not only by economists (Perramon [2011], Leinweber and Mandhavan

[2001]) but also by historians (Gelderblom and Jonjer [2005], Petram [2011]). A sign of the importance of this book is that the European Federation of Stock Exchanges (FESE) offers an annual prize in the name of José de la Vega to the best study on financial markets.

This book is not a work on stock exchanges or economics, nor is it a legal analysis. It acts more as a description of the beginning of the activities and games of the stock exchange. Nobody by that time had tried to understand and describe this activity. Even in Amsterdam, there was no technical work about this frantic activity.

The style of Vega's book is very rhetorical and makes frequent references to Latin and Greek mythology, rendering it difficult for modern readers to approach. Vega is aware of this difficulty but prefers to be understood by only a few readers.

There will be readers capable of understanding all of what I say. Perhaps there will not be many but there will be some and this is what I want. (para. 142)

It is evident from the reading of this book that stock exchange activity is something subject to all sorts of uncertainty. The prices of the two companies then traded in Amsterdam varied wildly due to natural phenomena or to the irrational activity of the traders. In turn, news that was true, false, and invented complicated the formation of prices. Joseph de la Vega detects and colorfully documents some investor behaviors that currently are frequent topics in the behavioral finance field. In addition, he offers several

Copyright © Teresa Corzo, Margarita Prat, and Esther Vaquero. This is an Open Access article. Non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly attributed, cited, and is not altered, transformed, or built upon in any way, is permitted. The moral rights of the named authors have been asserted.

Address correspondence to Teresa Corzo, ICADE, Universidad Pontificia Comillas, c/o Alberto Aguilera 23, 28006 Madrid, Spain. E-mail: mcorzo@upcomillas.es

pieces of advice that anticipate the current state of behavioral finance.

Other precursor studies of behavioral finance have been identified, such as the 1896 work by Gustave le Bon, *The Crowd: A study of the Popular Mind*, an influential book on social psychology, and Selden's [1912] *Psychology of the Stock Market: Human Impulses lead to Speculative Disaster*, but all of these studies were written later than CC.

Using the taxonomy of applications of behavioral finance described by Barberis and Thaler [2005]—the cross-section of average returns, closed-end funds and comovement, investor behavior, and corporate finance—the work of Joseph de la Vega can be framed in the area of documenting investor behavior. In addition, within this broad field of studies on investor behavior, CC focuses only on some of the main biases.

Vega's book, CC, written in Spanish, was translated into Dutch in 1939, and some scripts were translated into English in 1957. In this paper, we will use, where possible, the 1957 English translation, but on several occasions we offer the reader the present authors' translation, as the English translation is not complete. Author's translations are indicated at the end of quotations. The Spanish version used in this paper is the one edited jointly with the Dutch translation in 1939, as it has numbered paragraphs, which facilitates quotation. The paragraph number is specified in brackets.

The paper is organized as follows. In the second section we introduce Joseph de la Vega and his work. In the third section we document the behavioral biases found in CC, and we comment on them. We conclude in the fourth section. At the end of the paper, we include an Appendix, where the original Spanish quotes cited along this paper can be found.

JOSEPH DE LA VEGA AND HIS WORK

Joseph de la Vega is the author of *Confusion de Confusiones*, but the first confusion concerns his own name and birthplace.

His name varies between his works for two reasons. In Spain at that time, a change of place or kingdom of residence often led to this variation, but also Jews frequently changed their names when they converted to Christianity or emigrated (Torrente [1980]).

His family was from Cordoba, but it is not clear whether he was born in 1650 in Cordoba or in Amsterdam because his parents had immigrated to Amsterdam by that time.

CC, published in Amsterdam in 1688, does not pretend to be a treatise on the stock exchange; rather, it is "a set of the experiences of a gambler" (Anes [1986]) that contains references to complex exchange operations, philosophical elements based on classical culture, and a complete description of how the Amsterdam Stock Exchange operated. Joseph de la Vega lived in the collapse of the Oriental

Indies Company of the Netherlands, which financially ruined him.

Joseph de la Vega describes the workings of the exchange, in particular those of the "ruedas or corros" (rings), in which everybody could work directly or by means of an agent. For him, the distinction between "bulls" and "bears" is very important. He calls the bulls "liefhebberen" and the bears "contramineros." He also describes at length the way in which orders are made and formally settled.

The book is structured in dialogues, a form very much in vogue in the 17th century. The three protagonists in the dialogues are an erudite shareholder; a cautious merchant, who gradually becomes aware of a new way of making money; and a quick-witted philosopher. The philosopher is initially skeptical but becomes enthusiastic by the end of the work.

There is no order in the book, and the subject changes constantly. The first dialogue concerns the origin and etymology of the word "share," the meaning and use of options (opsies) and the techniques performed by actors in the exchange. In the second dialogue, Vega discusses the volatility of prices and the reasons for this instability, events that cause changes in the behavior of buyers and sellers. The third dialogue considers contracts, specifically how participants agree to prices, when they sign the agreements and how they deliver the shares or merchandise to the buyer. The fourth and final dialogue considers the speculative aspects¹ of this business, which he attributes to the diverse abilities of the actors but also to external influences (rumors or false news).

The author defines this business as "enigmatic":

This enigmatic business which is at once the fairest and most deceitful in Europe. (para. 16)

In addition,

Even as it was the most fair and noble in all Europe, so it was also the falsest and most infamous business in the world. (para. 21)

In his initial dedication to D. Duarte Núñez de Costa, Vega considers the stock business a game of chance:

This unique business is normally called a game. Why? I will personally call it 'men' because every man wants to play it. (para. 5, Author translation)

In the same dedication, he says that the exchange business has a questionable origin:

If in this game the one who most steals most wins, how can I be the best at stealing the humorous thing without giving the game all my time? (para. 5, Author translation)

Joseph de la Vega has multiple aims in writing this book: to entertain the reader, to describe the share business, and to tell the truth. This last objective implies telling the reader the risks of the game (Benito [1969], p. 22).

It is necessary to paint with the tools of truth the means of deceiving the adversary. (para. 6, Author translation)

Although it is clear throughout the book that the exchange occurs in a market, only in the third dialogue is there a clear mention of the premises where trading takes place. However, Vega states that this business can be conducted everywhere:

The business is so constant and incessant that hardly a definite place can be named where it goes on. (para. 203)

In the opinion of Vega, the stock exchange has only one role: to earn money (Torrente [1980], p. 91). For this reason, the originality of this book is its technical explanation of aspects that nobody had previously described in detail.

Most of the operations and activities that Vega describes remain valid. The author does not consider that the exchange has a social role, a place where companies can find investors and where savers can allocate their savings. In addition, he does not consider the stock exchange the only place where the share business will take place.

According to Vega, the stock exchange has no relation to general economic welfare and is of no use for implementing political economic policy.

Even if Vega states that this game can be the falsest and most infamous business in the world, he provides some consideration of the range of players' moral sense:

Innumerable men earn their living in its shadow. And those who are satisfied with the fruits and do not insist on pulling up the roots... will admit that they do pretty well in such business. (para. 19)

This statement implies that depending on the moral sense of the players, trading can be a business of gamblers.

In paragraph 65, he mentions the reasons why shareholders must have information because of their influence on business development:

The conditions in India, European politics, and opinion on the stock exchange itself.

In Vega's opinion, the behavior of the shareholder depends in a great way on his overconfidence, although sometimes this overconfidence is derived from the actions of powerful people:

There are times in which the powerful investor is followed by many, even at the cost of losing money. (para. 73)

Groups of bull and bear investors drive the behavior of other investors who often lack knowledge or discretion. These uninformed investors follow the tendency of the moment and buy or sell without a clear motivation, trusting in their luck and hoping that the tendency of the markets will favor their position.

BEHAVIORAL FINANCE IN CONFUSION DE CONFUSIONES

As Subrahmanyam [2007] asserts, behavioral finance allows for the explanation of financial phenomena on non-rational behavior among investors. Behavioral models are based on how people actually behave and, based on extensive experimental evidence, explain the findings better than classical finance. A pioneer person bridging the gap between psychology and finance is Paul Slovic, especially in his works of late sixties and early seventies.² The development of behavioral finance as we currently know it began with works by Tversky and Kahneman [1973, 1974], who describe heuristics employed when making judgments under uncertainty, and Kahneman and Tversky³ [1979], who propose the revolutionary *prospect theory*, a descriptive model of decision making under risk, which became an alternative model to expected utility theory. Other early studies in behavioral finance are works by Thaler [1980] and De Bondt and Thaler [1985]. However, Richard Thaler⁴ sets the true origin of behavioral finance on October 19, 1987, when stock prices fell more than 20% without any important news and when many economists began to take behavioral approaches to finance more seriously. In addition, Shiller [2003] highlights that in the 1990s much of the focus of academic discussion shifted away from the econometric analysis of stock prices, dividends, and earnings and moved toward developing models of human psychology as it relates to financial markets.

As we noted earlier, in this study we claim that Vega produced the first work available that documents behavioral biases in finance. Specifically, his work focuses on investor biases.

Within the broad area of investor bias, we find evidence in CC of three major biases: herding, overconfidence, and regret aversion. In relation to overconfidence bias, there are several examples of excessive trading and overreaction and underreaction. In addition, in relation to the regret aversion bias, we find clear examples of the disposition effect.

Next, we detail the quotes where we find these biases and comment on their relationship with actual behavioral finance.

Herding

One of the most common investors' behaviors and the first we find evidence of when reading CC is herding. According to Shiller [2000], herding behavior, although individually

rational, produces group behavior that is, in a well-defined sense, irrational. Herding behavior has frequently been observed in the housing market as well as in the stock market, such as the 1987 stock market crash (e.g., Shiller [1990], Thaler [2005]) and the bursting of the dot-com bubble (Shiller [2005]); see also, for example, the early work by Charles MacKay, *Memoirs of Extraordinary Popular Delusions*.

As Devenow and Welch [1996] write, imitation and mimicry are perhaps among our most basic instincts. Herding can be found in fashion and fads, such as in simple decisions as how best to commute and what research to pursue. There is an especially prominent belief not only among practitioners but also financial economists (when asked in conversation) that investors are influenced by the decisions of other investors and that this influence is a first-order effect. Some other recent well-known papers on herding are Grinblatt, Titman and Wermers [1995], Wermers [1999], and Welch [2000].

Herding behavior is said to arise from an informational cascade. The idea of informational cascades (Devenow and Welch [1996]) is that agents gain useful information from observing previous agents' decisions to the point where they optimally and rationally completely ignore their own private information. Joseph de la Vega directly presents this same idea:

Merchant: In this chaos of opinions, which one is the most prudent?

Shareholder: To go in the direction of the waves and not fight against the powerful currents. (para. 67, Author translation)

Despite all these absurdities, this confusion, this madness, these doubts and uncertainties of profit, means are not lacking to recognize what political or business opinions are held by persons of influence. He who makes it his business to watch these things conscientiously, without blind passion and irritating stubbornness, will hit upon the right thing innumerable times, though not always. (para. 79)

This observation is related to the paper by Bickchandani, Hirshleifer and Welch [1998], where we find that learning by observing the past decisions of others can help to explain some otherwise puzzling phenomena about human behavior. For example, why do people tend to converge on similar behavior, in what is known as "herding"? Why is mass behavior prone to error and fads?

Therefore, it is not important that the basic value of the shares be practically nothing as long as there are other people willing to close their eyes and support those contradictions. (para. 81)

However, we note here that herding is used by Joseph de la Vega in a different sense than in the actual behavioral literature. In CC, herding helps investors to avoid making the

wrong decision—the decision that will make you lose money—whereas in recent research, herding leads people and even entire populations to make systematic erroneous decisions (Devenow and Welch [1996]).

Nevertheless, both perspectives recognize that herding is linked to imperfect expectations, but Vega argues that this herding behavior, even when actors know that it is not consistent with the right information, will help them to avoid losses and to recognize the irrationality of prices. It is likely that the difference lies in the holding period considered; Vega does not appear to be adopting a long-term perspective in making these affirmations. In addition, we should consider that Vega wrote his essay before the first bubbles appeared and burst.

Overconfidence

Overconfidence bias is one of the most commonly explored biases in the behavioral finance literature. It is also among the most often observed biases in the financial markets. In fact, there are some authors, such as Plous [1993], who argue that overconfidence is the most dangerous bias. An early trace of this bias can be found in Slovic [1972].

Overconfidence is derived from one's self-perception, so people tend to overestimate their skills and capabilities. In moments when one believes that he can achieve impossibly high targets or when one repeatedly succeeds, the overconfidence phenomenon arises because one does not realize what is actually achievable. Related to this phenomenon, evidence has been found of the undervaluation of other's capabilities.

In this paper, we focus on financial markets. In such markets, as Batchelor and Dua [1992] state, investors tend to undervalue investors' community forecasts while simultaneously believing in their own forecasts.

It should be noted that there are a range of approaches complementary to overconfidence. In addition, overconfidence leads to different consequences, which have been widely studied. Among all of these approaches, one of the most interesting is the one that explains that people, when facing a certain event, are prone to overvalue their capabilities instead of undervaluing themselves and underestimating their skills, as reported in Shiller [2000] and Hirshleifer [2001].

Overconfidence can be observed periodically throughout the four dialogues in CC. The authors will focus on the most relevant references to overconfidence.

According to the news, the shares should be quoted at 1000, but the actual value is only 500; however, the shares should be quoted at 400, but it happens that they are quoted much more highly. (para. 71, Author translation)

As can be observed, the shareholder highlights the difference between the intrinsic stock value and its market value, simply trying to show that such a difference is due to a personal and distorted perception of reality. This inaccurate

perception may be derived from strong confidence (that is, overconfidence) in one's opinion rather than in what is evident.

According to Griffin and Tversky ([1992], p. 1), "people are often more confident in their judgments than is warranted by the facts"; this statement brings to mind paragraph 74 in CC, which states that transactions are made without any justification:

They will sell without knowing the motive; and they will buy without reason. They will find what is right and they will err for fault of their own.

In this paragraph, such strong overconfidence is due to the lack of fundamental reasons supporting what the shareholder does. It could be said that this behavior is a mix of both overconfidence and herding.

It happens that an investor continues to make the same investments primarily because in the past he did well, and either he does not worry about whether there have been any changes or, if he knows, he does not take them into account into his forecasts or decision-making processes. Therefore, it is his instinct and continuing to do what he has always done that explain his behavior.

In fact, sometimes there are reasons explaining why a trade no longer exists or has changed; therefore, engaging in such behavior is not rational. However, there are still investors who extrapolate from the past to justify predictions without reconsidering them. In response, Joseph de la Vega makes a definitive statement:

It is contrary to philosophy for contraminors to continue to sell when there is no longer any reason to do so, and in their insistence, the effect persists after the cause has ceased to exist." (para. 120, Author translation)

It has been shown that one of the forms taken by overconfidence is trading solely based on how well one does and think he does, which is neither reasonable nor rational. Therefore, as Joseph de la Vega states, these investors will have to find a comprehensive explanation they can provide the investor community that justifies what they are doing:

Speculators do not fail to seek protection against such excesses, using even the faintest reasons capable of sustaining their thesis. (para. 77, Author translation)

Overconfidence bias also considers how people hold on to their achievements and past successes, believing that they can continue to succeed forever. De la Vega warns us about this thinking and attempts to make us avoid engaging in such behavior:

If fortune is on your side, be grateful, and do not ruin things with unjustified pride. (para. 95, Author translation)

Overconfidence not only is related, as stated in the previous paragraph, to holding onto past achievements, but it also leads to the undervaluation of the setbacks traders face and

the belief that such events will never recur. In fact, if one faces a bad outcome in trading, the investor should be more tough and rational, as De la Vega reminds us:

It is a mistake to say that you are not going to err twice. (para. 172, Author translation)

Another aspect directly linked to overconfidence is the effect that overconfidence bias has on trading volume. For example, Shefrin [2000] links overconfidence to high trading volume. He is not the only author with this opinion. Among others, Shiller [2000] states that regardless of the mechanism leading to overconfidence, this attitude becomes an important driver of high trading volume in speculative financial markets. He believes that were people not overconfident, trading volumes would be substantially lower.

Following Thaler [2005], we can say that one of the clearest predictions of rational models of investing is that there must be limited trading. In a world where rationality is common knowledge, potential buyers are reluctant to buy if potential sellers are reluctant to sell. In contrast to this prediction, the volume of trading is very high. We refer to this fact in behavioral finance as excessive trading.

Excessive Trading

In CC, we find that there was already excessive trading at Vega's time, and it is interesting to note some wise advice that he gave on this subject.

Barber and Odean [2000] find that investors would do substantially better if they traded less. Transaction costs are a cause of this underperformance. Vega provides some sensible advice in this respect:

I am of the opinion that one should trade little because my philosophers tell me that in order to increase your strength, you should not eat a lot but rather digest your food well. (para. 125, Author translation)

He also has an original take on the enthusiasm with which shareholders normally conduct business:

A person who is always in action (buying and selling) you will without doubt call a shareholder. (para. 211, Author translation)⁵

In addition, he comments that the interest in shares and in this business is so great that everybody wants to be part of the game:

The trade has increased so much over the last five years that everybody is now involved: women, old people, even children. (para. 240, Author translation)

As stated earlier, the most prominent behavioral explanation of such excessive trading is overconfidence.

One possible explanation for this increase in trading volume is provided by Griffin and Tversky [1992], who describe how more experienced investors are more

confident in their predictions and thus about their decisions, leading them to initially tend to trade more than inexperienced investors. However, given the previously mentioned herding effect, inexperienced investors will observe the activities of the experts and tend to copy them, as the experts' overconfidence is contagious.

Overreaction and Underreaction

According to De Bondt and Thaler ([1987], p. 1), overreaction occurs when "they [people] overweight recent information and underweight base rate data." That is, such overweighting leads to extreme reactions that drive asset prices substantially above or below their fundamental value. It should be noted that overconfidence usually generates overreactions or underreactions (Kent, Hirschleifer and Subrahmanyam [1998]). This overreaction can be accompanied with the source of speculative bubbles. For this reason, phenomenon of bubbles can be studied from the perspective of overconfidence bias and subsequent overreaction.

In CC, there are few clear references to this bias because these statements usually appear alongside references to overconfidence bias. However, Vega makes the following statement concerning overreaction bias:

Unexpected news arrives, and shareholders panic. Shares are sold, but shareholders soon feel a sense of despair; they feel mistaken, and after some time they discover that they were wrong in their dealings. (para. 69, Author translation)

There is a clear connection between this statement and a finding made three centuries later by De Bondt and Thaler [1987], who state that vast distances between price and intrinsic value are based on the belief in more recent news (regardless of its truth or the sources' credibility) rather than a company's history and fundamentals. Such a case, as De la Vega says, provokes both extreme upward (overreactions) and extreme downward (underreaction) reactions.

Such extreme reactions make lead to two investor profiles: those who tend to overestimate good results and forecasts, and pessimists, who analyze the news under a negative scope, leading them to become even more pessimistic. Joseph de la Vega broadly explains the behavior of these two groups of investors. He calls optimists "liefhebberen" and pessimists "contraminores." In paragraphs 83 and 86, Joseph de la Vega clearly defines them and observes that regardless of the actual news, both investors continue to follow their instinct and maintain their outlooks. Vega makes the following statement about liefhebberen:

They are not afraid of the fires, nor do they fear the earthquake. (para. 83, Author translation)

He says the following about contraminores:

They exaggerate the risks so much that the onlookers think they are witnessing death, even to the point of preferring death and disaster to anything else. (para. 86, Author translation)

We can observe in the descriptions of these liefhebberen and contraminores the precursors of modern bulls and bears.

Regret Aversion

Finally, we find in CC that investors show regret aversion and are somehow prone to a disposition effect. Regret is an emotional reaction, a pain felt when facing negative effects or the lack of positive effects of one's own decision or move (or lack of move). In finance, an investor may suffer such a feeling when his action, or lack thereof, yields a loss or a lost gain. Loomes and Sudgen [1982] developed a theory of regret. According to those authors, regret theory depends on two fundamental assumptions: first, several people experience the sensations we call regret and rejoicing; second, in making decisions under uncertainty, they try to anticipate and consider these sensations. The authors suggest that representing one fundamental factor in people's choices that has been overlooked in conventional theory are people's emotions.

In behavioral finance, this feeling is referred to as *regret aversion*, defined as the fear of regretting having made bad decisions. There is a large body of evidence of regret feelings in CC:

Some people are always unhappy. If they have bought and the prices fall, they are unhappy because they bought; if the prices rise, they are unhappy because they did not buy more. If they have sold they are unhappy because they sold for less than they could have; if they did not buy or sell, they are unhappy because they did not do anything; if they receive a tip and they did not follow it, they are also unhappy. Everything produces unhappiness. (para. 51, Author translation)

As Shefrin and Statman [1985] state, regret aversion represents an important reason for why investors may have difficulties realizing gains as well as losses. The positive counterpart to regret is pride, but as Kahneman, Knetsch and Thaler [1991] argue, regret is stronger, and this asymmetry between the strength of pride and regret leads inaction to be favored over action, which may be an obstacle to rational decisions.

The default option consisting of changing nothing, that is, inaction, may lead a trader to take an even greater risk. Traders may do so because regret is usually less pronounced when a bad result comes from a "decision not to act" rather than from a decision to act (Zeelenberg,

Van den Bos, Dijk and Pieters [2002]). In his book, De la Vega appears to be clearly aware of the effects of regret aversion on investors, offering advice intended to make investors act and take their profits:

Take every game without showing any remorse about missed profits. . . It is wise to enjoy that which is possible without hoping for the continuance of a favorable situation and the persistence of good luck. (para. 73)

Regret aversion is one of the causes of the so-called *disposition effect* (Shefrin and Statman [1985]), and the advice given by Joseph de la Vega also points to this topic.

Disposition Effect

The finding that investors are prone to sell winners too early and hold losers for too long has been labeled the disposition effect by Shefrin and Statman [1985]. Thaler [2005] proposes two behavioral explanations for these findings: investors may have an irrational belief in mean reversion, or they may rely on prospect theory and narrow their cognitive framing of the situation. Shefrin and Statman [1985] find the roots of the disposition effect in four elements: prospect theory, mental accounting, regret aversion and self-control.

Without mentioning the psychological causes leading the investor to inactivity (and probably without knowing anything about them), Joseph de la Vega was convinced that shares should be sold quickly when there was money to be made, and he makes this point on several occasions in his book:

A wise man eats right away the fruits found in season without any delay. (para. 97)

It is wise to collect some profit without waiting to collect all profit. Profits can be compared to arrows and it is wise to collect the profit of each arrow. (para. 127)

..Miracles should not be expected from the stock exchange and the only ones who will be happy will be the ones who enjoy the initial successes. (para. 128)

His advice appears to be confirmed in light of the results described by Odean [1998], who reports that the average performance of stocks that people sell is better than that of stocks they hold on to.

The statements in CC may also be closely related to the problem of *self-control* (Thaler and Shefrin [1981]), which concerns the control of emotions. The investor's rational impulse may not be strong enough to prevent the investor's emotional reactions from interfering with her rational decision making. If Vega's advice is followed, an improvement in self-control will be a direct result.

CONCLUSION

In this paper, we link Vega's *Confusión de Confusiones*, written in 1688, with current behavioral finance. We claim that Vega was a pioneer in the depiction of shareholder behavior, as his book contains several examples of investor bias.

Vega's work is the first study written about a stock exchange—the Amsterdam Stock Exchange during the 17th century—and its participants, the shareholders. CC was written in Spanish and was translated into Dutch in 1937 and into English in 1957. In 2010, it was also translated into Chinese. Although CC is not the only literary work of Vega, it is the one that has created the most interest and has been studied from several perspectives (i.e., Perramon [2011], Gelderblom and Jonjer [2005], Petram [2011]).

In this paper, we connect Vega's documentation on investor behavior with current investor biases studied in modern behavioral finance. We find evidence of three major biases in CC: herding, overconfidence, and regret aversion. In addition, we identify references to excessive trading, overreaction, and underreaction, as well as the disposition effect. In an old-fashioned and rhetorical Spanish style, Vega vividly portrays 17th century investor behavior, and we find with some satisfaction that what he describes does not differ from the behavior of modern investors.

ACKNOWLEDGMENTS

The authors are grateful to the Servicios de Estudios of Madrid Stock Exchange for facilitating the reading of different editions of *Confusion de Confusiones*. The paper benefited from comments of Antonio Arroyo, Ricardo Gimeno and an anonymous referee.

FUNDING

Teresa Corzo acknowledges financial support from the Spanish Ministerio de Ciencia e Innovación via project ECO2011-29144.

NOTES

1. See in relation to this point Leinweber and Madhavan [2001].
2. i.e., Slovic [1969, 1972].
3. Amos Tversky and Daniel Kahneman wrote many papers together that have greatly contributed to the development of the behavioral area, but it is not the aim of this paper to cite them all here.

4. Preface to *Advances in Behavioral Finance*, ed. Richard Thaler [2005].
5. This quote in Spanish is a play on words with the word *acción*. The meaning of this word is both action and share (stock).

REFERENCES

- Anes, G. *Introducción: en Confusión de Confusiones*. Ámsterdam, 1688. Madrid: Bolsa de Madrid, 1986.
- Barber, B. and T. Odean. "Trading is Hazardous to Your Wealth: The Common Stock Performance of Individual Investors." *The Journal of Finance*, 55, (2000) pp. 773–806.
- Barberis, N. and R. Thaler. "A Survey of Behavioral Finance." In R. Thaler (ed.), *Advances in Behavioral Finance vol.II*. New York: Russell Sage Foundation and Princeton University Press, 2005, pp. 1–75.
- Batchelor, R. and P. Dua. "Conservatism and Consensus-seeking Among Economic Forecasters." *Journal of Forecasting*, 11, (1992), pp. 169–181.
- Benito, J. "Boceto biográfico de la bolsa." *Anales de la Universidad de Murcia*, 27, (1969), N° 1–2–3–4.
- Bickhchandani, S., D. Hirshleifer and I. Welch. "Learning from the Behavior of Others: Conformity, Fads and Informational Cascades." *The Journal of Economic Perspectives*, 12, (1998), pp. 151–170.
- De Bondt, W. and R. Thaler. "Does the Stock Market Overreact?" *The Journal of Finance*, 40, (1985), pp. 793–805.
- De Bondt, W. and R. Thaler. "Further Evidence on Investor Overreaction and Stock Market Seasonality." *Journal of Finance*, 42, (1987), pp. 557–581.
- Devenow, A. and I. Welch. "Rational Herding in Financial Economics." *European Economic Review*, 40, (1996), pp. 603–615.
- Gelderblom, O. and J. Jonker. "Amsterdam as the Cradle of Modern Futures Trading and Options Trading, 1550-1650." In W.N. Goetzmann and K.G. Rouwenhost (eds.), *The Origins of Value, The Financial Innovations that Created Modern Capital Markets*. Oxford: Oxford University Press, 2005, pp. 189–205.
- Griffin D. and A. Tversky. "The Weighing Evidence and the Determinants of Confidence." *Cognitive Psychology*, 24, (1992), pp. 411–435.
- Grinblatt, M., S. Titman and R. Wermers. "Momentum Investment Strategies, Portfolio Performance and Herding: A Study of Mutual Funds Behavior." *American Economic Review*, 85, (1995), pp. 1088–1105.
- Hirschleifer, D. "Investor Psychology and Asset Pricing." *The Journal of Finance*, 56, (2001), pp. 1533–1597.
- Kahneman, D., J. L. Knetsch and R. H. Thaler. "Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias." *The Journal of Economic Perspectives*, 5, (1991), pp. 193–206.
- Kent, D., D. Hirschleifer and A. Subrahmanyam. "Investor Psychology and Security Market Under- and Overreactions." *Journal of Finance*, 53, (1998), pp. 1839–1885.
- Kahneman, D. and A. Tversky. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica*, 47, (1979), pp. 263–292.
- Le Bon, G. *The Crowd: A Study of the Popular Mind*. London: T. Fisher Unwin, 1896.
- Leinweber, D. J. and A. N. Madhavan. "Three Hundred Years of Stock Market Manipulations." *The Journal of Investing*, 10, (2001), pp. 7–16.
- Loomes G. and R. Sudgen. "Regret Theory: An Alternative Theory of Rational Choice Under Uncertainty." *The Economic Journal*, 92, (1982), pp. 805–824.
- MacKay, C. (1841). *Memoirs of Extraordinary Popular Delusions*. London: Richard Bentley (first ed.). Harriman House Classics, Petersfield, 2008.
- Neal, L. "Efficient Markets in the Eighteenth Century. The Amsterdam and London Stock Exchanges." In J. Attack (ed.), *Proceedings of the Business History Conference*, Urbana, IL, 1983.
- Odean, T. "Are Investors Reluctant to Realize their Losses?" *The Journal of Finance*, 53, (1998), pp. 1775–1798.
- Perramon, J. M. *Influencia de la Informació Económica en la Borsa a Confusión de Confusiones*. Barcelona: Universitat Autònoma de Barcelona, 2011.
- Petram, L. O. "The World First Stock Exchange: How the Amsterdam Market for Dutch East India Company Shares Became a Modern Securities Market, 1602-1700." University of Amsterdam: Faculty of Humanities, 2011.
- Plous, S. *The Psychology of Judgment and Decision Making*. New York: McGraw-Hill, 1993.
- Selden, G. *Psychology of the Stock Market: Human Impulses lead to Speculative Disasters*. New York: Ticker Publishing, 1912.
- Shefrin, H. *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*. Oxford: Oxford University Press, 2002.
- Shefrin, H. and M. Statman. "The Disposition to Sell Winners to Early and Ride Losers Too Long." *The Journal of Finance*, 40, (1985), pp. 777–790.
- Shiller, R. "Speculative Prices and Popular Models." *Journal of Economic Perspectives*, 4, (1990), pp. 55–65.
- Shiller, R. "From Efficient Markets to Behavioral Finance." *Journal of Economic Perspectives*, 17, (2003), pp. 83–104.
- Shiller, R. *Irrational Exuberance* (2nd ed.). Princeton, NJ: Princeton University Press, 2005.
- Slovic, P. "Analyzing the Expert Judge: A Descriptive Study of a Stockbroker's Decision Process." *Journal of Applied Psychology*, 53, (1969), pp. 255–263.
- Slovic, P. "Psychological Study of Human Judgment: Implications for Investment Decision Making." *The Journal of Finance*, 27, (1972), pp. 779–799.
- Subrahmanyam, A. "Behavioral Finance: A Review and Synthesis." *European Financial Management*, 14, (2007), pp. 12–29.
- Thaler, R. "Toward a Positive Theory of Consumer Choice." *Journal of Economic Behavior & Organization*, 1, (1980), pp. 39–60.
- Thaler, R. "Preface." In R. Thaler (ed.), *Advances in Behavioral Finance, vol. II*. New York: Princeton University Press and Russell Sage Foundation, 2005, pp. xi–xvii.
- Thaler, R. and H. Shefrin. "An Economic Theory of Self-Control." *Journal of Political Economy*, 89, (1981), pp. 392–410.
- Torrente Fortuño, J. A. *La bolsa en Joseph de la Vega*. Madrid: Bolsa de Madrid, 1980.
- Tversky, A. and D. Kahneman. "Availability: A Heuristic for Judging Frequency and Probability." *Cognitive Psychology*, 5, (1973), pp. 207–232.
- Tversky, A. and D. Kahneman. "Judgment Under Uncertainty: Heuristic and Biases." *Science*, 185, (1974), pp. 1124–1131.
- Vega, Joseph de la. *Confusión de Confusiones*. Ámsterdam, 1688. Madrid: Bolsa de Madrid, 1997.
- Vega, Joeseph de la. *Confusion de Confusiones* (M. F. J. Smith, ed.). Den Haag: Martinus Nijhoff, 1939.
- Welch, I. "Herding Among Security Analysts." *Journal of Financial Economics*, 58, (2000), pp. 365–396.
- Wermers, R. "Mutual Fund Herding and the Impact on Stock Prices." *The Journal of Finance*, 54, (1999), pp. 581–622.
- Zeelenberg, M., K. van den Bos, E. Van Dijk and R. Pieters. "The Inaction Effect in the Psychology of Regret." *Journal of Personality and Social Psychology*, 82, (2002), pp. 314–327.

APPENDIX

Original Spanish quotes cited along the paper. These quotes have been extracted from the 1939 edition in Dutch and Spanish (ed. M. F. J. Smith). This edition has numbered paragraphs, and we use these numbers to identify the quotes

as we have done along the paper. The quotes are cited in the same order as they appear within the main text.

142: "Havrá algunos, aunque sean pocos que lo entiendan y sobrarne á mi que lo entiendan algunos, aunque sean pocos."

16: "Un negocio enigmático que es el mas real y mas falso que tiene la Europa."

21: "el mas real y mas noble que ha via en la Europa y el mas falso y infame que ha via en el mundo."

5: "Llámase generalmente juego este negocio, y yo digo que es del hombre este juego. . . porque todos *entran* en él. Luego, si en este Juego quien mas roba mas gana, como puedo dexar de robar las horas á lo preciso si pretendo ganar con estos robos lo gracioso?"

6: "pintar con el pinzel de la verdad las estratagemas con que lo tratan los tahures que lo desdoran."

203: "Es tan continuo e incessable el negocio que apenas hay lugar fixo que pueda intitularse su palestra."

19: "hay innumerables que ganan la vida á su sombra yaseguro que los que se contentaren con cogerle el fruto á su sazón, sin aspirar á arrancarle de una vez las raíces. . . confesarán ser . . . las flores muy odoríferas y los frutos muy sabrosos."

65: "*El estado de la India, la dispocision de la Europa y el juego de los accionistas.*"

73: "Hubo coyuntura en que la patada de un grande hizo abrir por *sympathia* aqui la tierra en cuya voracidad se hundieron muchos."

67: *Mercader*: Y en esta variedad de opiniones y diferencia de combates, qual es la mayor prudencia? *Accionista*: Inclinar hacia donde echa la corriente y seguir las olas quien pretende que le baylen delante las aguas.

79: "Y sin embargo de todos estos d vaneos, desconciertos, desvarios, dudas y incertezas para los aumentos, no faltan medios para conocer cándidamente hacia donde inclinan la mayor parte de los sugetos de suposicion, tanto en lo político como en lo esencial, y el que hiziere proffession de seguirlos con sinceridad de animo, sin passion que lo ciego ni capricho que lo altere, no dezará de acertar infinitas vezes, sino acertare todas, y reconocerá al ajustar la cuenta que no hay sutileza como hirse tras el juego ni ciencia como arrojarse tras la corriente."

81: "Que importa pues, que estén las acciones moribundas, y que tengan herederos forçosos á quien deviera tocar el avanço de las tribulaciones, si hay cintas y agudezas con que les hazen dar de cabeça para lo que intentan, torciéndoles la garganta para donde quieren?"

71: "apuntan las nuevas dever valer las acciones 1000 y ellas se obstinan en valer 500; buelven á mostrar las sombras el numero de 400 y ellas á subir."

74: "venderan sin saber porque motivo, comprarán sin saber porque causa y acertarán o errarán sin saber porque razón."

120: "Opónesse la philosophia el uir vendiendo los contraminores, despues de haver parado la causa porque venden,

pues mis philósophos me afirman que en cessando la causa, cessa el effeto. *Sublata causa tollitur effectus*, y en esta obstinacion hallo que va prosiguiendo el effeto despues de cessar la causa."

77: "No dexan de encontrar los especulativos algun arrimo para defença destas monstruosidades, sutilizando las razones de subir."

95: "Si os diere la mano la Fortuna para conseguir en nuestro juego el laurel, agradecidle modestos la ternura, celebrad decorosos la dicha y no desflores con el orgullo el cariño."

172: "Es ignorancia afirmar que no os ha de succeder segunda vez el desayre porque como poco acostumbrado á los disgustos, ya se os representa en el primer infortunio que os faltan los cielos."

125: "Lo que os aplaudo es el consejo de negocear poco, pues ademas de conformarse con mi genio, me advierten mis philósophos que no se aumentan las fuerças con comer mucho sino con digerir bien."

211: "teniendo por indubitable que les aplicareis el título de *accionistas* por estar *siempre en acción.*"

240: "Aumentósse en estos cinco años de suerte este empleo que es raro el sexo que no lo exercita, sin excepcion de viejos, niños y mujeres."

69: "Llega una nueva impensada á la rueda de los accionistas, creen algunos á primer vista que cada circunstancia que se inventa es un leon para rendirlos y una fiera para devorarlos; huyen de las acciones, desesperan de la ganancia, esclaman por el engaño y al cabo vienenea averiguar con tanta verguença como pena que los dientes se passaron á los mormuradores y las uñas á los ambiciosos, con que no hallan pies ni cabeça á lo imaginado y quedan sin pies ni cabeça en lo vendido."

83: "á ellos ni los muebe el incendio ni los fatiga el estrago."

86: "exageran de tal modo los riesgos, y encarecen de manera las agonias que quien los oyere entenderá ser mas suave la muerte que la amenaza, y mas dulce el exterminio que el amago."

51: "si el que compra algunas partidas vé que baxan, rabia de haver comprado; si suben, rabia de que no compró mas; si compra, suben, vende, gana y buelan aun á más alto precio del que ha vendido; rabia de que vendió por menor precio: si no compra ni vende y ván subiendo, rabia de que habiendo tenido impulsos de comprar, no llegó á lograr los impulsos; si van baxando, rabia de que, habiendo tenido amagos de vender, no se resolvió á gozar los amagos; si le dan algun consejo y acierta, rabia de que no se lo dieron antes; si yerra, rabia de que se lo dieron; con que todo son inquietudes, todo arrepentimientos, todo delirios, luchando siempre los insufrible con lo feliz, lo indomito con lo tranquilo y lo rabioso con lo deleytable."

73: "*Que no hay cosa como ganar y arrepentir, . . . es prudencia gozar lo que se puede, sin esperar estabildades de la ocasion, ni constancias de la Fortuna.*"

97: “no hay mayor habilidad en el que la de comer luego los frutos en que nos regala la ocasión, sin esperar á hajarles con el tiempo la flor, ni á cercenarles con la dilacion el gusto.”

127: “El dictámen de recoger la ganancia sin aspirar á conquistar de una vez los talentos . . . es tan discreto, que mal piensa de la Fortuna (dize un docto) el necio que la finge

desarmada, quando la juzga poderosa, porque acumulando aljivas en los thesoros, y rayos en erarios, cada favor es un harpon y cada beneficio una flecha.”

128: “. . .para mostrar que no se deven esperar milagros de la suerte y que solo el que se contentare con las primeros agasajos sabrá gozar tranquilo de sus milagros.”