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*“Behavioural Corporate Finance: Insights into human's irrationality”*

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## **Abstract**

In the last decades the field of behavioural finance has seen an exponential evolution, giving issues that facilitates people's economics decision making.

As the name suggests, behavioural finance gathers two main academic worlds: the one of cognitive psychology and the other one of finance.

The idea is to deviate from the neoclassical conception that represented human beings as completely rational (Homo Economicus), shedding light on a more modern view, which represents mankind as a biased creature. This specific view of behavioural analysis into humans' mind is quite new. Until Kahneman and Tversky's Prospect Theory was published in 1979, the most spread perspective was the neoclassical approach that embodies humans' rationality viewpoint.

This thesis aims firstly at contextualizing the historical factors that brought to the rise of this new branch in economics that is born as an opposition to the Efficient Market Hypothesis; Subsequently, through the instruments that behavioural finance offers, shed a light on how biases represent an important burden in managers' decision-making and how they constitute a substantial threat on firm's cash flows.

Finally, this thesis will offer an in depth analysis on the relation between CEOs overconfidence and M&A activities with the aim of understanding if this important bias can influence takeover activities.

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## **Chapter 1: The History of Behavioural Finance**

From the second half of the 20<sup>th</sup> century the traditional idea that saw the human being as a creature that was completely rational and economic, the so called Homo Economicus approach, was completely questioned by a new perspective. Finally in the emergent economic theories, the irrational side of mankind found particular relevance. Human's actions are in fact modified by a several cognitive biases that play a substantial role in the decision making process. In this contest, probably two of the founding fathers of this new branch in the economic field are Daniel Kahneman and Amos Tversky that in 1979 with their Prospect theory shed light on the irrationality of human beings by analysing the individual behaviour in circumstances that involved risk. Behavioural finance in particular is born as an opposition to the EMH and proposes an explanation to market inefficiencies.

### **1.1 The Efficient Market Hypothesis (EMH)**

In 1953, Maurice Kendall, a British statistician reported a paper to the Royal Statistical Society on a study carried out on stock prices. He was impressed in seeing that prices didn't reflect regular and linear cycles but rather they followed a "random walk". Maurice Kendall in providing his theory, that prices follow a random walk, meant that stock prices movements in subsequent years were independent of one another. The major implication about the Efficient Market Hypothesis and the random walk analysis, proposed by Fama in 1965, was that past prices could not be used to predict future prices. Fama strongly believed in his core concept that market prices reflected all available information, and thus that stock prices corresponded to their fundamental value. For this reason in 1970 presented three different approaches to the EMH. The weak form, which argues that all the prices reflect all the information available in the past prices, the semi-strong form that affirm that the prices reflect all available information in the market, thus leading to investors' impossibility to outperform the market, and the strong form which claimed that, prices reflected not only all public information but also private ones.

Is fundamental to stress that the Efficient Market Hypothesis are not intending that all investors act rationally, but they do underline that markets are rational. This means that markets cannot foresee future but they can construct unbiased future estimates. With respect

to the Efficient Market Hypothesis and their relation with financial investments it is important to point that stock prices are constantly and rapidly adjourned with all the information available on the market, thus implying that neither technical analysis nor even fundamental analysis can help investors to substantially beat the market.

During the 1970s the EMH theory was widely spread and accepted by economists, which suggest that people strongly used to believe that markets and securities reflected all available information. Starting from 1979, Kahneman and Tversky questioned the validity of the EMH publishing their masterpiece on prospect theory, that was mainly based on people decision making process involving risk and probabilities. Their approach was substantially an opposition to the widely spread expected utility theory as their main assessment was that people often embrace incorrect choices when risk is involved. Prospect theory was one of the first approach that analysed human being in taking financial decisions involved with risk and it represented the stepping stone to investigate mankind under a psychological point of view.

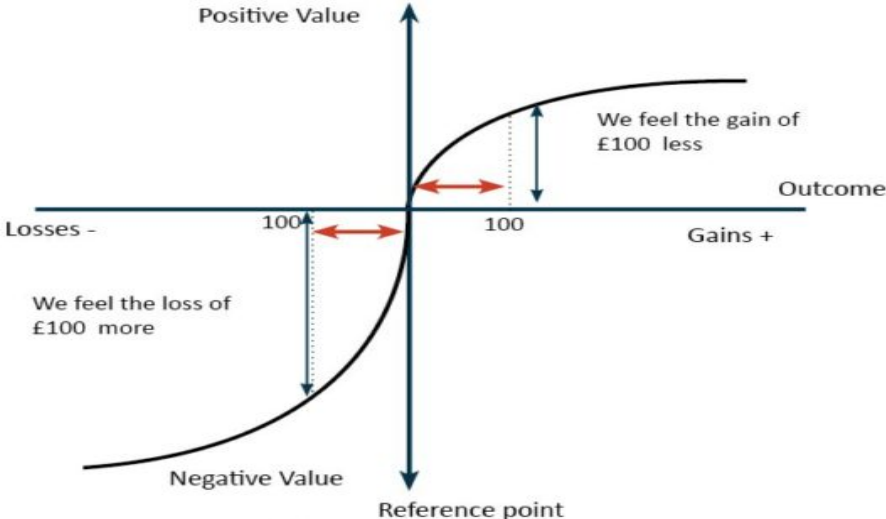
## **1.2 Kahneman and Tversky's Prospect Theory**

The importance gained through the years by the field of behavioural finance, which is nowadays recurrent in corporate finance issues, investments and insights regarding market efficiency must be attached to the enormous findings of Kahneman and Tversky's prospect theory of 1979. Prospect theory was suggested as an alternative approach to the well-developed subjective expected utility (SEU) theory. Alongside with the EMH the subjective expected utility theory depicted human beings as fully rational agents and this was the consequence of market efficiency; by considering that markets provide investors with reliable information, individuals can make decisions in a rational way that will result in a final utility maximization. The idea of prospect theory is that the conventional approach do offers the best-detailed analytical predictions however it fails not for the specific theories but rather for the institutional parameters that regard for example moral hazard and principal-agent problem that could lead to irrational behaviour. Kahneman and Tversky's intention is not to replace the well spread theories of EMH and SEU, which they still consider as being normative but rather to shed light to humans behavioural trap that generate cognitive mistakes. The main difference between the subjective expected utility theory and the prospect theory is that while in the former choices are defined as reference-independent in the latter choices are reference-

dependent. Prospect theory assesses that utility is based on individuals' approach towards gains and losses, which are established relative to a reference point. This means that utility is conditioned by changes in the wealth of a person relative to some reference point. On the other hand in the subjective expected utility theory there is no reference point. The affection of utility is based on the interaction of both the individual's wealth condition and the subjective valuation of this condition. The perspective of Prospect theory is that what is crucial to individual's utility is the change in the wealth condition rather than the general wealth condition at any given point.

In an interview released on Forbes magazine (Ackman, 2002), Kahneman gave his own interpretation on Bernoulli's (1738) choice evaluation regarding the Amsterdam spice trade. Bernoulli investigated on the result of a gamble and the specific utility of the result basing on the expected utility theory. The gamble in question regarded the investment on a ship and a cargo that had to cross the sea; this gave positive outcome if the expedition succeed and negative outcome otherwise. However, in Bernoulli's evaluation, the mistake was considering the final wealth of the outcome rather than thinking in terms of gain and loss. Kahneman assessed that thinking in terms of final outcome brings the individual in a condition of risk neutrality rather than thinking in terms of gains and losses. Actually this is referred as the main distinction between the SEU theory and the prospect theory and the different mathematical forecast are depicted in Kahneman and Tversky's value function of 1979. The prospect theory, in fact, illustrates a utility function with both negative and positive domains and the shape reflects how changes in wealth burden on investor's future decisions. On the other hand SEU theory depicts a utility function bounded only to positive domains where, in addition gains and losses are perceived equally in terms of change in utility.

**Figure 1: Representation of Kahneman and Tversky's Utility Function**



(Source: <https://www.economicshelp.org/blog/glossary/prospect-theory/>)

In addition, prospect theory stresses that the slope of its value function is steeper for losses than for gains by an amount of about 2 to 2.5 times. This means that prospect theory evaluates losses as more influencing than gains. Basically concerning SEU theory, adding and deducting 1\$ gives the same outcome in terms of utility. The shape of the curve in prospect theory is concave in the positive axis as for the SEU theory, however it is also convex in the negative domain and this results an S-shaped value function. In particular the value function keeps the same properties of diminishing returns to wealth and risk aversion in the positive domain as it is for the SEU theory. The two different slopes of the value function represent the key assessments of the prospect theory based on the concept that utility of gains increases in relative small percentages related to the disutility of losses. The interesting point is that in this particular scheme having an excess in gains over losses can still produce a negative outcome in utility, thus driving the individual to reject something that would not be reject in SEU theory. This gives the final prospect where sometimes individuals are perceived as not fully rational in particular circumstances, where the concept of rationality stands for wealth maximization.

### **1.3 Behavioural finance through the 1980s**

Starting from 1980, Thaler, based on Kahneman and Tversky's Prospect Theory, opened the main review of the economic theory of that time based on the rational maximizing model. This approach was structured on the idea that humans collect all the possible information before taking decisions and thus they are fully rational at the end of their evaluation process. In 1980, Thaler's idea was actually that the rational economic theory didn't portrayed human beings in real life as he found that people are often hampered by mistakes such as neglecting to reject sunk costs and underweighting opportunity cost. With this particular critique the sphere of behavioural finance is born. At the beginning of 1985, Thaler and De Bondt collaborated in a study that regarded the overreaction of the stock market. Substantially their hypothesis was that the presence of a cognitive bias in an individual could represent the impetus for equities' mispricing in the New York Stock Exchange. Actually their study encapsulated the psychological field in order to examine how individuals react to sudden and tragic announcements on stock returns. Their conclusion fully supported their first assessment

thus proving that people do absolutely overreact to bad news and this creates huge consequences on their future portfolio decisions. In 1988, the two psychologists Andreassen and Kraus additionally tested the accuracy of the Efficient Market Hypothesis by showing to people a stream of past stock prices in order to investigate on individuals' investment behaviour. Basically the result confirmed that when people recognized in stocks' past prices a repetitive trend, they actually tended to extrapolate the information that generated a substantial impact on their investment decisions. For sure the '80s through its inquiries and discoveries placed the stepping-stone that generated in peoples' mind the doubt on the validity of the EMH.

#### **1.4 From the 1990s to the Current State**

Through the 90s the attention shifted from concepts that regarded especially the time series on prices, dividend policy and earnings to a meticulous analysis of the consequences that human behaviour had on financial markets. In particular, in 1991 Thaler and Shiller introduced the National Bureau of Economic Research that centred a series of conference on behavioural finance. The curious thing was that the revolution on the behavioural sphere was proceeding alongside with the one on psychology thus stressing more the correlation between feelings and decision-making. This created the big effort that supported the evidence of the strong impact that feelings had on investment decisions. The important findings on behavioural finance field helped Thaler in 1999 to predict the huge disruption of the Internet stock boom thus putting a stop to the widely credited EMH of the previous years that saw all humans as being fully rational. However in those years due to lack of information about the psychological field and its relation to humans' investment decisions, Thaler's (1999) idea was only an assessment without proofs and in relation to this in fact said "Until such data become available, we will never fully understand what I think will become known as the 'Great Internet Stock Bubble'". Thaler's conviction was that the market was actually 20-30% overvalued and the only justification for its increasing trend was that investors who were inclined to bet on a decrease had fewer dollars to triumph over the leading mass that were pushing up the prices. Moreover people used a general rule for their financial investments, around 60% was allocated on equities; with this regard Thaler thought that financial investors should have been deciding their asset allocation basing on possible market crash. As was expected, the Internet tech bubble crack in 2000 alongside with the Down Jones Industrial



Average that lost more than the 30% of its value. In 2003, Shiller recognized that the role of emotions played an important role in this upward/downward trend of the market as investors' faith increased sharply from 1989 to 2000. He argued that the media were actually spreading the wrong feeling about the market's upward trend, which in turn had a strong impact of influence on people. Thaler's predictions in 1993 alongside with Shiller's post analysis in 2003, shed light on the important tools that the field of behavioural finance could offer in investment approach. During the years, behavioural finance tried to determine the main elements that caused the stock booms and crashes and how they are related with human mistakes. In 2014, Statman explained that behavioural finance replaced the idea of rational people, which was present in the modern finance approach, with the one of normal people thus alluding to the biased sphere of human beings. In 1999, Thaler was convinced that investors were actually divided into two groups: the fully rational investor and the quasi-rational investor. According to Thaler there is no existence of a fully rational investor and on the other hand the quasi-rational investor seeks to make decisions in order to end up with good investments, however he can be diverted by mistakes and biases. For this reason is the quasi-rational investor that must be taken into account in the behavioural finance field.

### **1.5 Challenging the Efficient Market Hypothesis**

The general idea of behavioural finance is that it proposes alternative evidence on market inefficiencies in the Efficient Market Hypothesis (Baker & Ricciardi, 2015; Hirshleifer, 2015). In 2015, Hirshleifer proved a fallacy in the semi-strong market form efficiency by demonstrating that the stock price of the firm EntreMed jumped 600% up after having published old information that were know yet five months earlier. Actually this experiment and its result demonstrate an inconsistency especially with the semi-strong hypothesis that took for granted the rapid adjournment of prices with respect to new published information. The field of behavioural finance analyses finance under a psychological and sociological point of view rather than addressing it under a market efficiency perspective.

In 2014, Statman gave an additional division between the standard finance approach and behavioural finance. Basically, Statman's idea was that the standard approach to finance considers markets as being fully efficient and people as completely rational. This implies that the difference on portfolio returns is given just by risk. On the other hand the behavioural approach to finance assumes that markets are not fully efficient and people are completely

rational and thus the difference on portfolio returns is not just a function of risk but rather it depends also on other factors. In 2016, Thaler suggested that economics should embody both normative models and descriptive models where the former illustrates the best solution to precise problems, while the latter should encapsulate the psychological sphere of humans' behaviour.

The aim of behavioural finance is to analyse finance by using social and psychological factors rather than with an efficient market viewpoint. Behavioural analysts spent last decades in demonstrating how emotions have a substantial impact on a person's financial behaviour. For example, Kuhnen and Knutson (2011) found that being in a good mood increased risk-taking behaviour and on the other hand, Lerner and Keltner (2001) demonstrated that fear generates risk-averse behaviour and pessimistic emotions.

## **Chapter 2: Behavioural Approach to Corporate Finance**

The field of “corporate finance” aims to explain a particular topic in finance, which can be defined as the interaction of managers and investors and how this synergy plays a substantial role in the value of the firm.

One of the concepts at the basis of modern corporate finance thought is the belief that investors, and in general corporate entities, act rationally in the market. If the idea of rationality is correct, managers can take decisions assuming that markets fully reflect all available information, which in turn means that securities are always perfectly priced. Rational behaviour, which can appear as a subtle point, contains a broader and more interesting issue. Under rationality, investors must not be scared that managers will take charge of self-interested risky projects. However in the last decades, the modern approach of economic literature, based its studies on the issue that individuals do not always behave rationally, and this represented a fallacy in the Efficient Market Hypothesis. This incongruity, motivated scientists to analyse economic irrationality, which is not in turn considered by modern corporate finance, under a psychological point of view.

In the next paragraphs the attention will shift to the explanation of how the behavioural approach analysed in the previous chapter, has a strong impact at a corporate level. The intention is to introduce the main behavioural traps and briefly expose which are the main effects that they have on corporations. The concentration then will shift to the two main biases of overconfidence and optimism that are recurrent in most of the average of managers. In particular the burden of overconfidence will play a substantial role in the next chapter in which will be analysed in the context of Mergers and Acquisitions.

### **2.1 Behavioural Corporate Finance**

Behavioural finance gathers the economic and psychological field to explain financial decisions taken by managers. It is different from the modern finance view, which saw corporate entities as fully rational. Behavioural finance in fact embodies the irrational aspect of the individual and aims at the explanation of how this can be a serious burden on the decision making analysis. The behavioural approach to corporate finance flipped the traditional one, which was characterized on firms’ value-based management and three

conditions: rational behaviour, capital asset pricing model and efficient markets highlighting that all these three components are affected by psychological factors. Behavioural corporate finance is based on the concepts of limited arbitrage and individuals' irrationality. In financial markets, the concept of arbitrage can be explained as the exploitation of stocks mispricing. The simplest definition of arbitrage is to buy low and sell high. The perspective of the supporters of the EMH presumes that the professional investors will take advantage of these price variations caused by irrational investors, in this way, these price variations will be temporary. On the other hand, the supporters of the behavioural approach states that since the effect of mispricing is not well balanced as the supporters of the EMH argue, the professional investors must be inclined in accepting a higher level of risk seeking to exploit the market mispricing. In the end, under the behavioural approach, this elevated risk will lead the professional investors to perform badly thus reducing a small quantity of mispricing. For this reason, this process is defined as limited arbitrage.

The concept of limited arbitrage underlines that in real market, stocks that may not find perfect substitutes bound to put in place arbitration; this sheds a light on the reason why new information does not always affect changes in stock price. On the other hand, the concept of irrationality is based on the awareness that people make precise errors in making financial decisions, precisely they are overconfident and overestimates past experiences.

Behavioural corporate finance, through the use of psychology, is interested in describing the biases that affect managers' economic decisions and how they have a strong impact on the firm's cash flows. As Shefrin (2001) states: "Behavioural corporate finance theory plays a great role in the practice of corporate finance".

The studies on behavioural corporate finance are mainly focused on topics that regard the psychological impact on capital budgeting decisions, mergers and acquisitions and capital structure. The behavioural issues on corporate finance analyse the biases that influence managers on decisions that concern the well being of the firm; moreover the intent is to channel them toward an almost rational behaviour. In particular Shefrin analyses two types of barriers that threaten the value maximization goal of managers: an internal and external one.

- The internal one is associated with the so-called behavioural cost that are described by Shefrin as mistakes made by managers due to emotional influences

- The external one derives from errors made by analysts in evaluating the true fundamental value of a stock that can lead managers in a confusion status when they have to evaluate different alternatives.

There is a substantial discordancy on the behavioural cost that we have analysed so forth between the so-called supporters of value-based company management and the promoters of the behavioural corporate finance. The former define behavioural cost as a phenomenon that can be completely avoided through incentives while the latter are convinced that behavioural cost are a more complicated issue than what is usually thought and for this reason they cannot be eliminated through incentives.

Basically, the analysis of behavioural corporate finance gave rise to two different approaches. The first one is based on the effect of the irrationality of investors' behaviour and the second one analyses the consequences of the managers' irrational behaviour. The 4<sup>th</sup> chapter of the Handbook of Corporate Finance by B. Espen Eckbo that will be adopted as guideline in the following paragraphs illustrates empirical issues on the study of the two approaches that are necessary in order to represent the perfect balance in managerial and investment behaviours.

## **2.2 The irrational investor approach**

The idea at the basis of this first approach is that investors' decisions are not fully rational and this behaviour has a strong impact on managers' decisions that in turns are perceived as being rational. In this approach it is assumed that arbitrage in security market is imperfect, thus stock prices may be too high or too low and this can have an influence on stock issuance. Rational managers perceive mispricing in the sense that are able to understand the incongruity between the stock price and its fundamental value and make decisions in order to emphasize mispricing or not. At the same time, managers seek to balance three main objectives. The first one is trying to increase the fundamental value of the firm. This may be done through selecting and investing in projects that increase the present value of the future cash flows of the firm. The fundamental value can be expressed as  $f(K, \cdot) - K$ , where  $f$  is increasing and concave in new investment  $K$ . The second goal regards catering activities, which are manager's decisions intended to increase stock prices above its fundamental value which are represented by the function  $\delta(\cdot)$ , where  $\delta$  depends on the nature of investor sentiment. The third goal regards the exploitation of temporary stock mispricing that is done

through a market timing financing policy in which managers supply shares that are momentarily overvalued and repurchase the ones that are undervalued. Long run shareholders gain  $e\delta(\cdot)$ , where  $\delta$  is the difference between the current price and the fundamental value and  $e$  is the fraction of the firm sold. The three goals together suggest in the irrational investor approach the behavior of a manager that seeks to find the correct balance between investing and financing decisions in order to:

$$\max_{K,e} \lambda [f(K,\cdot) - K + e\delta(\cdot)] + (1 - \lambda)\delta(\cdot),$$

(Source Handbook of Corporate Finance Volume 1 by B. Espen Eckbo)

Here  $\lambda$ , which is a number between zero and one, expresses the manager's horizon. When  $\lambda$ , is equal to one, the last term cancels out and it represents a manager that wants only to create value for actual long-run shareholders and this means that there is no catering activity. We consider  $\lambda$ , as an exogenous factor, which is determined by personality, company issues and remuneration contract. The managerial activities of selling equity or exercising options in the near term can have a decreasing impact on  $\lambda$ ,

If we differentiate the equation with respect to  $K$  and  $e$ , we have the two equations that represent the optimal investment and financial policy of a rational manager that acts in inefficient capital markets

$$\begin{aligned} f_K(K,\cdot) &= 1 - \left(e + \frac{1-\lambda}{\lambda}\right) \delta_K(\cdot), \\ -f_e(K,\cdot) &= \delta(\cdot) + \left(e + \frac{1-\lambda}{\lambda}\right) \delta_e(\cdot). \end{aligned}$$

(Source Handbook of Corporate Finance Volume 1 by B. Espen Eckbo)

The first condition is about investment policy in which the marginal value from investment depends on the standard cost of capital, normalized to be one here, net of the impact that this incremental investment has on mispricing, and hence its effect through mispricing on catering and market activities. On the other hand the second condition relies on financing activities where the loss of value created from moving the firm's actual capital structure toward equity depends on the direct market timing gains and the effect that the additional issue of equity has on mispricing, and hence its impact on catering and market timing gains.

### 2.3 The irrational manager approach

In this second approach the idea is that managers are not fully rational in taking financial and investment decisions. An assumption of this approach is that managers are able to decide themselves, thus emphasizing that are not controlled by the governance system. Basically, there are two types of decisions taken by managers which can be defined as: unintentional and intentional. The unintentional decisions result as a consequence of mistakes done by managers while the intentional ones are the effect of a difference between managers and shareholders interests. The mistakes that happen in the unintentional decisions are a consequence of psychological factors that can be for sure diminished through managerial training.

The psychological and economical materials on managers are really ample. The idea at the basis is that individuals do not always perform rationally and logically. Most of the studies that have been done in corporate finance rely mainly on to main biases that are the ones of optimism and overconfidence. Optimism and overconfidence resulted to be two of the main traps that are recurrent in managers' personality and has been proved that they generate in the individual the propensity in taking riskier projects than the average. Even if managers at the beginning of their careers are recognized with no biases, the effect of success generated by their achievements will lead managers to turn into overconfident ones. In our analysis we start by assuming that managers are optimistic about the value of the firm's asset and investment opportunities. He then tries to manage two main goals. The first one as stated for the irrational investor approach is to maximize the fundamental value of the firm. This may be expressed by  $(1+\gamma) f(K, \cdot) - K$ , where  $\gamma$  is an optimism parameter. Must be noticed here that managers are optimism both of the asset in place ( $f$  can include a constant term) and new opportunities. The second managerial goal is to minimize the perceived cost of capital. This lead to a similar expression that we analyzed in the previous paragraph for market timing but with the exception that an optimistic manager strongly believes that there is no right time to issue equity. For market efficiency the true fundamental value of the firm is given by  $f - K$  and in particular managers suppose that the company is under its fundamental value by a quantity  $\gamma f$  and thus in selling a portion of the firm  $e$  they expect that the actual long run shareholders will suffer a loss of  $e\gamma f(K, \cdot)$ .

Putting the two goals together, the optimistic managers will balance investment and financing activities in order to

$$\max_{K,e} (1 + \gamma)f(K,\cdot) - K - e\gamma f(K,\cdot).$$

(Source Handbook of Corporate Finance Volume 1 by B. Espen Eckbo)

If we differentiate with respect to  $K$  and  $e$ , the result gives the two optimal choices for an optimistic manager that operates in efficient capital markets concerning investment and financial policy

$$f_K(K,\cdot) = \frac{1}{1 + (1 - e)\gamma}, \quad \text{and}$$

$$(1 + \gamma)f_e(K,\cdot) = \gamma(f(K,\cdot) + ef_e(K,\cdot)).$$

(Source Handbook of Corporate Finance Volume 1 by B. Espen Eckbo)

The first condition regards investment policy where managers decide to overinvest where the marginal value creation is less than one rather than setting the marginal value created from investment equal to the true cost of capital. The more optimistic ( $\gamma$ ) is the manager and the less equity ( $e$ ) he is forced to raise in financing investment, the greater the problem. The second condition regards financing policy where the loss of additional value from shifting the firm's current capital structure away from equity is balanced against the perceived market timing losses.

## 2.4 Cognitive Biases and Effects

Most of the behavioural traps that are known have been studied and defined by Daniel Kahneman and Amos Tversky, two of the main pillars of the behavioural finance field. Their studies in fact have been honoured with the Nobel Prize received in 2002 by Kahneman. Essentially Kahneman and Tversky define three different psychological phenomena, which are: Biases, Heuristics and Framing.

### 2.4.1 Biases

The nearest word that can be used to define a bias probably is prejudice; in fact, a bias is the tendency to commit a mistake caused by false beliefs.

Basically the biases are divided in four different categories: Optimism bias, Overconfidence, Confirmation Bias and Illusion of control.



**Optimism bias:** Is the tendency to overestimate positive results and underestimate negative ones. Basically is difference between personal expectations and the actual result. The excessive optimism has been one of the milestones of the Prospect Theory discussed by Kahneman and Tversky in which the main idea is that people tend to flip small probabilities with big ones. According to Kahneman and Tversky this is a limited ability that humankind has in evaluating extreme probabilities. With this regard at corporate level this bias can lead to a reduction in the company's profit. On the other hand regarding M&A activities, managers, affected by overconfidence and excessive optimism, tend to overestimate the outcome of the possible synergy underestimating the risk correlated with the deal.

**Overconfidence:** The concept of overconfidence is particularly linked to personal beliefs. People that are overconfident generally lose the awareness of their own limits. Overconfidence pushes an individual's mind toward the conception of being more intelligent than the average ("better than the average effect"). Usually a common mistake is to think that overconfidence is the same concept as optimism. It is true that they often go hand-in-hand but they are two different issues. Some managers can be extremely pessimistic but still be overconfident. If managers are too overconfident, an underestimation of risk (choosing an interest rate which is too low) can lead in the reduction of the value of the firm.

**Figure 2: Net Present Value Formula**

$$NPV = -I + \frac{E(X_1)}{1+r} + \frac{E(X_2)}{(1+r)^2} + \frac{E(X_3)}{(1+r)^3} + \dots$$

Source: (<http://people.bath.ac.uk/mnsrf/Teaching%202011/Cass%202010%20BCF.pdf>, p13)

**Confirmation Bias:** Is the tendency to consider only information that fully support your belief thus ignoring the ones that are in contrast with your own view. Sometimes managers use to spent a lot of time on issues that can support their opinions rather than looking for reasons that can disprove their point of view.

The confirmation bias can occur not only at individual level but it also influences groups leading to an event called "groupthink". In general, a group exhibits the "groupthink"

phenomenon when reaching the unanimity is more important than the actual valuation of alternatives. This can occur due to stress conditions or when the leader of the group has a stronger personality compared to the other members.

The consequence of this bias can be for example a lack of responsiveness that can lead to a reduction in the profits of the firm.

***Illusion of control:*** Is the perception of the individual of having full control on each situation. In general managers tend to overestimate the control that they have on results. Psychological evidence demonstrates that the awareness of having excessive control increases the degree of optimism. For this reason, this bias has been always analysed alongside with excessive optimism and overconfidence. It has been questioned but without pragmatic results whether this particular mental trap can exist independently and if it can have an impact in deals regarding M&A.

#### **2.4.2 Heuristics**

Heuristics are defined as mental shortcuts used to solve more difficult cognitive issues. Every human being make use of heuristics and these are automatic processes that happen in an individual's mind, however these paths can lead sometimes to mistakes that in the specific case of managerial decisions could threaten the well being of the firm. Basically there are four different kinds of heuristics and these are: Representativeness, Availability, Anchoring and Affect.

***Representativeness heuristics:*** Kahneman and Tversky first introduced the notion in 1974. Representativeness heuristics are basically linked with the tendency of the individual to express judgments and forecasting future on the basis of stereotypes. This often results in overestimates done by managers on future events with the reluctance of accepting the empirical evidence. Since 1982, Fortune Magazine has conducted different interviews to managers concerning corporate reputation. Questions regarded the quality both of the management and of the shares of a given company and the financial soundness of the firm. The result of this questionnaire was that managers believe that good stocks belong to good companies and in addition that good companies are also the safer ones. This little interview actually confirmed that executives behave using representativeness heuristics

***Availability of information:*** Sometimes managers end up in making decisions using information that are more available with respect to others that are less. In 1973, Kahneman

and Tversky investigated on this particular heuristics on the basis of cognitive psychology regarding the judgement of frequency and probability.

**Anchoring:** In the anchoring heuristic the individual has the tendency to literally anchor himself towards beliefs that he is not going to deviate, thus the decision making process will automatically orbit around this preconceptions. The main consequence is connected with the loss in the value of the company caused by a distortion in the managerial estimates.

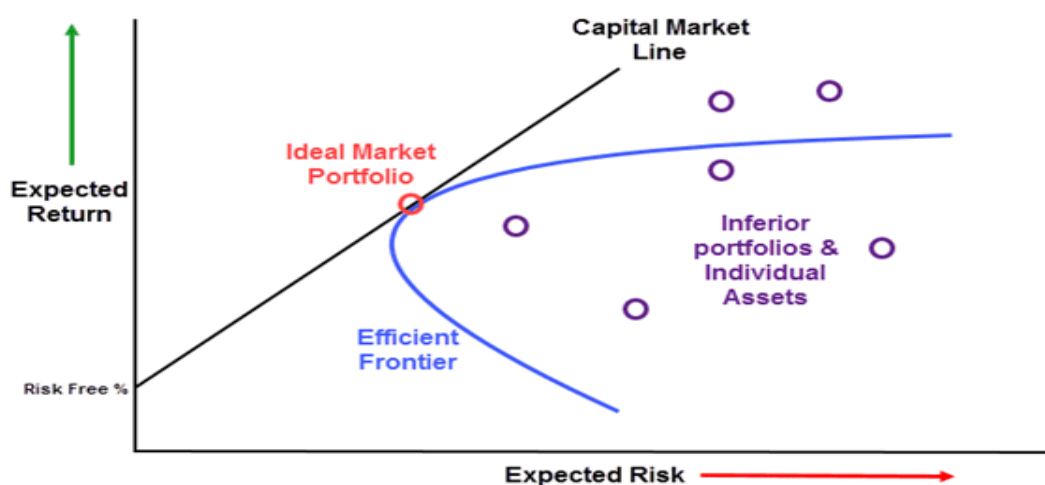
**Affect heuristic:** Is the subject's tendency to build its own assessments on the basis of emotions and feelings thus not considering analytical and pragmatic evaluations. For this reason a lot of companies base their own choices regarding projects using the payback rule in addition to IRR and NPV.

This is a mental shortcut that can lead the manager to prefer projects that will end up in a negative NPV due to emotional evaluations.

Since 1997, Fortune magazine conducted the same type of interviews as the ones mentioned above regarding the relation between risk and performance. Obviously the sample group was different however the answers were more or less the same. Managers in fact think that the relation between risk and performance is strictly negative, considering, on their assumptions that, more solid firms should give a higher level of return.

Nevertheless, recalling the CAPM the correlation between the risk called beta and the return is decisively positive ( $R=R_f + \beta (R_m - R_f)$ ).

**Figure 3: Graphical Representation of CAPM (beta on the horizontal axis and return on the vertical axis)**



(Source: <https://www.investopedia.com/terms/c/capm.asp>)

Thus the results of the investigation made by Fortune suggest that managers are fully affected by heuristics in their assessments on risk and performance. In particular these heuristics are formed by a combination of representativeness and affects that lead managers to biased conclusions. The affect heuristics generates in human beings the willingness to obtain benefits preventing risks. Benefits are positively perceived while risks are negatively thus leading to a negative correlation between benefits and risks. Basically, affect heuristics and representativeness heuristics brings managers to negatively relate return with risk.

### **2.4.3 Framing Effects**

The framing is a key issue in the prospect theory analysed by Kahneman and Tversky thanks to which Kahneman received the Nobel Prize in 2002 for having introduced two of the main framing effects which are: loss aversion and “sure” loss aversion. The concept of loss aversion arises in people that are more scared about risk that can lead to losses, rather than the thought of gaining from a general financial decision. For example, although its tax exemption status, managers renounce in recurring at the debt capital structure. The second framing effect is the “sure” loss aversion in which the individual seeks to recover a previous loss by pushing himself toward a circumstance with a higher probability of loss. Managers affected by this bias jeopardize the wealth of the company by choosing sometimes investments with a negative NPV.

Psychologists have worked several years in finding a method that can help managers and investors to manage these biases. The process of debiasing, in fact, is an important tool that helps the individual in the recognition of those mistakes that are a crucial burden for the well being of the company.

### **2.5 Overconfidence and Optimism: Two burdens for the well being of the company**

The two biases of overconfidence and optimism that we have described in the previous paragraphs hide in their nature some threats that are recurrent in the corporate finance issues. As we stated so forth, overconfidence and optimism boost managers towards projects with

negative NPV. In fact these two biases encourage managers in activities of overestimation of future projects' cash flows without considering the risk associated with those same projects.

“In 1987, Motorola had the idea to develop a new form of communication that could allow people to receive and make calls all over the world. Basically Motorola's engineers decided to submit the plan of the new technology to the three main corporate bodies of the company: Robert Galvin, who was the CEO during those years, John Mitchell and William Weisz. Substantially the project required an investment of 5 billions of dollars, with profits expected in 11 years. Although the project required a huge amount of money and faith, the three managers accepted the plan proposed by the engineers.

The curiosity about this new project named Iridium stands in the fact that during the presentation of the program submitted by the engineers, the three managers didn't ask any question about the economic side of the project that included: provisions about the cash flows of the project, IRR of the project, payback analysis.

In 1998, Iridium launched their first telephone and in 2002 the service covered the entire world. Nevertheless the low levels of market demand and the huge amount of debt taken to build the technology led Iridium to fall into bankruptcy. It was one of the biggest fails in American history during those years. “

(Source: “Finanza aziendale comportamentale” (2007) Hersh Shefrin, it. vers. Enrico Maria Cervellati)

This little anecdote helps in the introduction of the two main factors that lead a manager to fall in the overconfidence trap. The first one is the illusion of control; in fact, psychological researches demonstrated that the excessive feeling of self-confidence drives managers to underestimate the associated risk.

The second factor is strictly linked with the idea of risk managing. It has been proved that managers are more confident with risk that they personally took into account and are oriented to underestimate the same risk presented by others.

As stated at the beginning, excessive optimism leads managers to choose projects with negative NPV due to overestimates in the future cash flows that these same projects could mature. However it is interesting in defining how excessive optimism affects both projects in public and private sector.

On February 1<sup>st</sup> 2005 the Wall Street Journal reported that military expenses for missions in Iraq were three times bigger than the expectations (60 billions of dollars). Another example

can be done for the project approved in 1985 called The Big Dig in Boston with an expected cost of 2,6 billions of dollars. Actually the real cost in 2005 was around 15 billions of dollars. In general has been proved that the estimates on projects related with transport infrastructures were 28% lower than the real value in 9 cases out of 10. Moreover, the excessive optimism leads to overestimate also the expected revenues of a given project. A recent study, demonstrated that passengers of European transport infrastructures were 39% lower than the expectation.

Some distortion happens also in the private sector where only 42% of the projects respect the expected budget and only the 37% of them is completed in the timetable. But which is the implication of these behavioural traps? The answer lies in high probability of financial distress.

Financial distress is defined as the difficulty to maintain promises to creditors, and sometimes it leads to bankruptcy. In fact, overconfident managers tend to overvalue projects that sometimes end up with negative NPV, wasting thus firm's capital. This implies that the firm will have less free cash flow that will lead to financial distress if sudden incidents occur.

## **2.6 Measuring CEO Overconfidence: A Proof on Financial Distress**

Analysing the decisions that managers make on their personal portfolio of company stock options has been a common measure in behavioural research in order to define CEO overconfidence. This study was first introduced by Malmendier and Tate in 2005 and is substantially based on following idea: Since the 1990s and specifically during 1990s, the principal US managers have collected stocks and option rewards in addition to their salary (Hall and Murphy 2003). This option rewards constitute a problematic issue for executives considering that they have limited ability in addressing this issue. In fact this options may be blocked until their "vest", that is the possibility to sell them only after a number of years or either after a fixed performance objective. This means that the executives cannot exercise this reward until they are vested and in addition managers are restricted from taking short positions in the firm's stock.

Based on these requirements, a rational manager in order to lower risk will exercise these options only once they are vested, before expiration in order to diversify. The right timing will depend on the "moneyness" of the option (that means, the amount by which the current price of the stock will exceed the strike price at which the executive has an option to purchase

the stock). On the other hand, overconfident CEO are optimistic about the future performance of their company and are more willing to hold these options with the expectation of having an higher return in the future.

However the CEOs behaviour related to this relevant issue it is strongly connected with the firm's performance. In particular, past analysis tried empirically to verify if managers' overconfidence could bring firm to go bankrupt. Two students (Chao-Rung Ho and Yuanchen Chang, 2009) of the National Chengchi University (Taipei, Taiwan) based their paper "CEO overconfidence and Corporate Financial Distress" on this specific study. Basically, they run a logistic regression of this form:

$$\Pr\{Y_{it} = 1|O_{it}, X_{it}\} = G(\beta_1 + \beta_2 O_{it} + X'_{it} B).$$

Source:(Chao-Rung Ho and Yuanchen Chang, p13, 2009)

Where G is the logistic distribution. O represents the overconfidence measure and X is the set of control variables. Y is the dependent variable, which is equal to 1 in the case, the firm, suffers from financial distress and is equal to 0 otherwise. The study that has been done is a general hypothesis testing (there are two main hypothesis, namely H0 (null hypothesis) and H1. The aim of the test is to refuse/accept H0 with the scope of verifying if the primary hypothesis is true or not) where the null hypothesis (H0) is that the coefficient  $\beta_2$  on the overconfidence variable O is equal to zero. Actually the examination demonstrated a substantial correlation between overconfidence and financial distress estimated by changing the impact of overconfident and rational CEOs on firm's performance. Moreover, it has been tested the huge impact that the Wall Street Journal has on managers in US. In fact articles that presented CEOs as being "confident" or "optimistic" pushed overconfident executives that are particularly inclined in sheltering their reputation to reduce the likelihood of financial distress by decreasing mergers that are not fruitful for the firm and to select carefully projects that could result to be disruptive for the well-being of the company.

## **Chapter 3: Mergers and Acquisitions: The Neoclassical and the Behavioural approach**

Mergers and Acquisitions (M&A) is an important issue at corporate level considering that every transaction can substantially increase the value of the two firms. With this regard a takeover has the principal aim of creating synergies, and for this reason a firm's executive will conclude a transaction only if the value of the synergy is positive. However this is not always the case and for this reason this chapter will first introduce the neoclassical approach to the topic which is in line with the first sentences stated above and then there will be an analysis, by applying the behavioural tools, in order to understand why the trend of M&A activities appears to be in waves, that is, in this case a big contradiction of the neoclassical view.

### **3.1 M&A: The Neoclassical Approach**

The theory at the base of the Neoclassical Approach, that we stated so forth, which is the one that considered mankind as a fully rational creature (Homo Economicus) plays an important role in the topic of M&A. If human beings act in a fully rational way, and thus their main corporate goal is to increase shareholder's value, then in the specific case of M&A they occur only if the final outcome is an increase in the value of the company (Nielsen and Bierregaard, 2010). This implies that managers are not going to consider mergers and acquisitions that are not profitable for the firm, since the opposite will discredit the Neoclassical Approach. The set of motives linked to a M&A are fundamental since they will guide the search for the target firm and are a of key importance in order to define whether not the M&A agreement can be defined rewarding. This represents an analysis that the firm must incur before taking into account this transaction since the goal must result in a value maximization of the firm. In the traditional approach related to M&A, that is the one that refers to the EMH, prices are considered to be efficient, thus this imply that the prices of the acquiring firm and the ones of the target firm reflect their fundamental value. In addition, the concept of M&A is strongly related to the creation of a potential synergy. The transaction of an M&A is carried out only if the value of the synergy is positive, that is, the value of the two firms combined is greater that the value of the two firms that operate separately

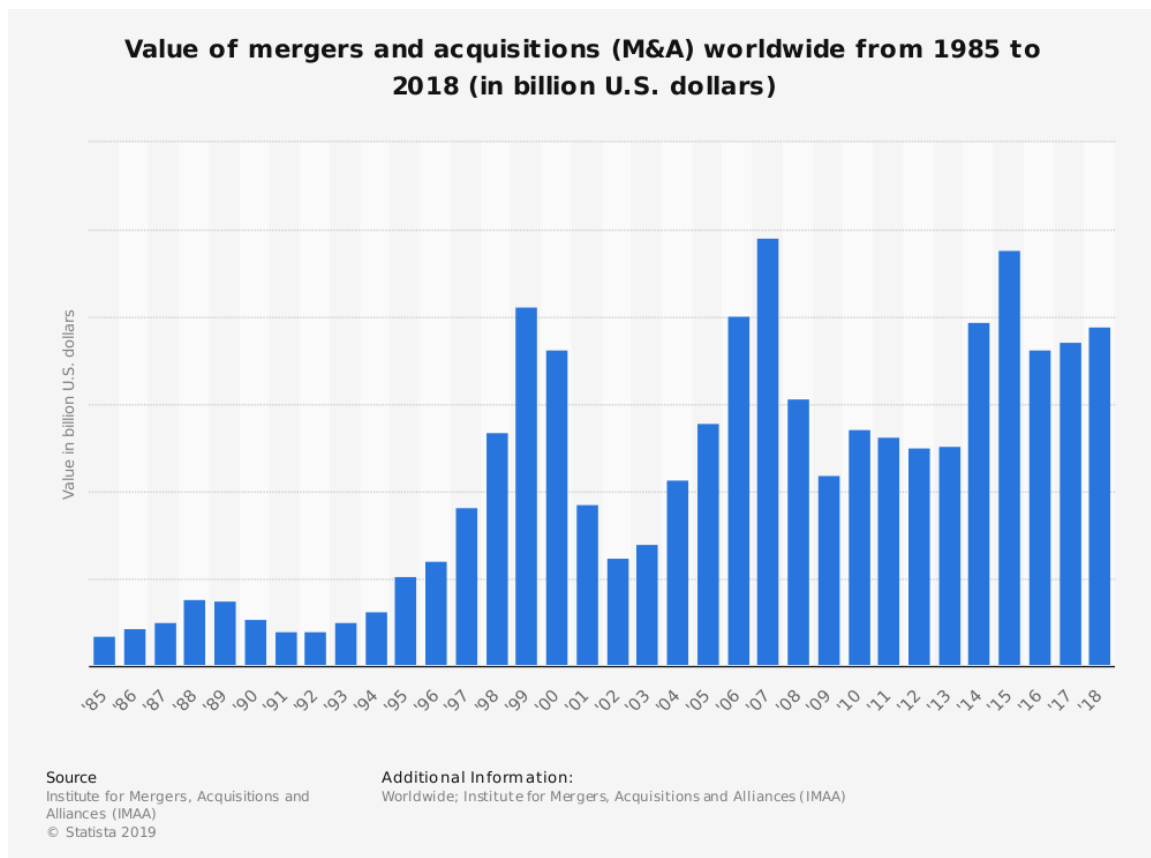


$$\text{Value (firmAB)} > \text{Value (firmA)} + \text{Value (firmB)}$$

Actually, there are two main types of synergies that are classified on the basis of the intent of the operation: revenue enhancing and cost enhancing synergies. Revenue enhancing is one of the most widespread motives for engaging in an M&A activities and it regards the objective of the firm in increasing the stream of cash flows given the combination of the two firms together. On the other hand, cost-enhancing synergies are based on the idea that the combination of the two firms could operate in a more efficient manner thus lowering the costs that the individual firms have by operating separately (Hillier et al., 2011).

From the buyer's perspective, the positive value of the synergy thus is strongly related to extent to which the value created is substantially higher to the costs associated with the acquisition.

**Figure 4: Value of M&A worldwide from 1985 to 2018 (Source: Statista)**



The figure above, taken from the website Statista provides information about the worldwide value of Mergers and Acquisitions from 1985 to 2018, submitted by the Institute for Mergers, Acquisitions and Alliances (IMAA).

Concerning Mergers and Acquisitions there are still nowadays issues that are not completely clear. The number of studies published regarding this particular field demonstrates that the majority of M&A transactions fail in delivering the expected outcomes, however managers still enhance the popularity of this phenomena. If Mergers and Acquisitions are entirely based on rational motives why the trend of this particular operation appears to be in waves?

This observation creates a lack of completeness of the neoclassical perspective on this particular issue and spread the topic over a wider range that employs theories such as managerial behaviour that are not contemplated in the neoclassical approach.

### **3.2 Overconfidence in M&A transactions**

The phenomenon of winner's curse is verified in situations in which winners end up in paying sums that are excessively bigger than the standard amounts. In particular this issue changes name but still keeps the same meaning in M&A contexts. In 1986 in fact Richard Roll introduced the concept of hubris hypothesis, which states that managers are sometimes too arrogant and overestimate the potential gain of synergies. This results in managers' propensity to pay more than the average in order to acquire the target firm. Obviously the phenomenon of overconfidence does not apply only for acquiring firms but also for target ones. Malmendier and Tate (2004) and Camer et al. (1999) hold that if this behaviour is verified also in target firms this will result in hostile takeovers. For example, if managers of the target firm argue that they can create the same value as the acquirer firm this can lead to a refuse of the bid, because managers consider it too low.

In recent years, KPMG conducted a study on the 700 principal M&A operations that occurred between the 1996 and the 1998 and this resulted in the discovery that most of the half of them disrupted the value of the firm. In addition, a survey conducted by McKinsey & Co demonstrated that managers of the acquiring firm tend to overestimate revenue enhancing synergies and cost enhancing synergies in 70% and 40% of the cases, respectively. Moreover the effect overconfidence-excessive optimism is more accentuated in firms that hold abundant internal funds. In 2017, Karen Peters, a student of Radboud University, presented her

Economics master thesis “ The role of CEO overconfidence in failed Mergers and Acquisitions” that was focused on the analysis of this particular phenomenon.

### 3.3 Peters’s Paper

The survey conducted was mainly based on 5 hypotheses. Hypothesis 1a: Overconfident CEO’s are more likely to conduct a merger and acquisition than non-overconfident CEOs. Hypothesis 1b: Overconfident CEO’s are more likely to conduct a merger and acquisition when there are abundant internal resources. Hypothesis 2a: Overconfident CEOs are more likely to perform a failed merger or acquisition than non-overconfident CEOs. Hypothesis 2b: With abundant resources, overconfident CEOs are more likely to engage in bad M&A attempts that subsequently fail compare to non-overconfident CEOs. Hypothesis 2c: Without abundant resources, overconfident CEOs are more likely to initiate M&A attempts that will fail compared to non-overconfident CEOs. (Peters 2017)

#### 3.3.1 Model and Variables

In order to verify the effects that overconfidence has on mergers and acquisitions a regression analysis has been performed. The set of data employed for this study is a panel kind because it provides multi dimensional data instead of one dimension; this means that this model analyses the effect that more variables have over time. The regression model is a logistic one, and this gives the possibility to analyse the correlation that a given outcome occurs in relation to different variables.

In order to test the effectiveness of the hypotheses the two following regressions have been run:

$$\Pr\{ Y=1|O, KZ, S, Q, CF, ST, C, G, OCF\} = \beta_1 + \beta_2 \times \text{OVERCONFIDENCE} + \beta_3 \times \text{KZINDEX} + \beta_4 \times \text{SIZE} + \beta_5 \times \text{Q} + \beta_6 \times \text{STOCKOWNERSHIP} + \beta_7 \times \text{COMPENSATION} + \beta_8 \times \text{GENDER} + \beta_9 \times \text{OVERCONFIDENCE} \times \text{KZINDEX} + \varepsilon$$

$$\Pr\{ Y=1|O, KZ, S, Q, CF, ST, C, G, OCF\} = \beta_1 + \beta_2 \times \text{OVERCONFIDENCE} + \beta_3 \times \text{KZINDEX} + \beta_4 \times \text{SIZE} + \beta_5 \times \text{Q} + \beta_6 \times \text{STOCKOWNERSHIP} + \beta_7 \times \text{COMPENSATION} + \beta_8 \times \text{GENDER} + \beta_9 \times \text{OVERCONFIDENCE} \times \text{KZINDEX} + \varepsilon$$

(Source: Peters 2017, p29)

#### Independent Variable

-Overconfidence: measured using the proxy Holder67 (A manager is considered overconfident if he/she holds a stock that is greater or equal than 67% in the money)

## Control Variables

- KZ Index: index that measures the extent to which a firm is dependent on external financing (measured using the formula at page 26)
- Size: in this model is measured as logarithm of total asset at the beginning of the fiscal year
- Tobin's Q: in this model is market value of assets divided by the book value of the assets
- Stock Ownership: Are the number shares held/total shares outstanding
- CEO compensation: it is calculated by taking the total earnings and option grants and bonus
- Gender: dummy variable (1 for female and 0 for male)
- Interaction Term: OverconfidenceKZindex (to assess whether or not the amount of internal resource is influential in the relation between M&A and overconfidence)

Where in the first regression Y is the binary variable that can assume value 1 or 0, where 1 means that at least one M&A activity happened during the fiscal year and 0 stands for the opposite outcome.

In the second regression, Y is always expressed as the dependent variable that can assume both value 0 and 1 where 0 represents the fail of the takeover and 1 the success.

We can notice from the model that the probability of the dependent variable is not only a function of overconfidence (independent variable) but rather it depends also on other variables that are added in the model as control variables.

Obviously it is difficult to find a precise method in order to measure overconfidence considering that biased beliefs and personal traits are difficult to recognize however different approaches have been developed. For example Ben-David et al (2013) measured managers' biases with the help of surveys about projections of US CFOs. Another method applied which in line with Roll's view was based on measuring the number of mergers and acquisitions conducted by executives. If the number of transactions was bigger than five in a time span of three years, managers are considered overconfident. However as surveys' measure for overconfidence, also the amount of M&A transactions cannot be a right approach in order to measure overconfidence. The ultimate group of proxies are the ones introduced by Malmendier and Tate (2004, 2005a, 2005b, 2008). They identified three proxies that are considered nowadays one of the most famous measures of overconfidence. The first one is Holder67, which is based on measuring time of option exercise in order to measure overconfidence. A manager is overconfident when he holds a stock option that it is at least 67% in the money.

The second one is "long holder" that has always to do with options exercise but in this situation an executive is considered overconfidence when he holds the stock until the

expiration date. The third is the net buyer proxy, which selects the habitual acquisition of company stock (Malmendier and Tate, 2005a, 2008). Moreover, in their surveys Malmendier and Tate (2004,2008) adopt a press-based measurement in order to assess managers' overconfidence. They collected several articles of different American newspapers that used to describe managers with words such as "optimistic" "confident" and also "reliable", "cautious". In this analysis, a manager is defined overconfident when the number of articles containing words that characterize the executive as confident is higher than the ones that describe him as cautious. In this specific survey the proxy used is the one referred to the moneyness of the options considering that the data for long holder proxy and the ones for the press-based measurement are not publicly available.

In order to discover the 67 proxy, first of all must be computed the moneyness of the option. The server Execucomp is not able to provide it directly and thus must be approximately

$$\text{Moneyness of options} = \frac{\text{Stock price at fiscal year end}}{\text{stockprice at fiscal year end} - \left( \frac{\text{total realizable value of unexercised exercisable options}}{\text{number of unexercised exercisable options}} \right)} - 1$$

Source: Peters (2017), p24

calculated using the approach of Core and Guay (2002) and Campbell et al (2011). The moneyness of the option is calculated by dividing the total number of exercisable unexercised option that the manager holds for the number of unexercised exercisable option. This computation provides the realizable value per option, which is essential in the evaluation of the average exercise price that can be calculated by subtracting the realizable value per option from the stock price at the end of the fiscal year. In the end the moneyness of the option can be calculated by dividing the average exercise price from the stock price. In the case that the moneyness of the option is greater than 67%, that is, the shares are more than 67% in the money, we can assume that the CEO is overconfident.

The net buyer proxy instead is a measure of the quantity of firm's shares that a manager buys and sells. It utilizes the habit that some managers have in purchasing additional firm's stock even though their own wealth is already well exposed to company risk (Malmendier and Tate 2005). In the overconfidence assessment regarding this proxy, will be used the approach adopted by Malmendier and Tate (2005). A manager is overconfident if in a year he/she buys more own firm shares than he/she sells in a year. Both proxies will be considered as dummy

variables in the regression with value 1 if the CEO is overconfident and 0 otherwise. In order to assess whether the amount of internal resource is influential in the relation between M&A and overconfidence, will be added the variable KZINDEX as an interaction to the regression. This index, known as the Kaplan-Zingales index measures the extent to which a given firm is dependent on external financing. As much as the index score is high, the more likely the company will be dependent on external financing. The approach originated from Kaplan and Zingales (1997) uses annual reports and information in order to determine whether a firm is constrained or not. In the measure have been combined five accounting ratios that are: cash flow to total capital, Q, debt to total capital (leverage), dividend to total capital and cash holdings to capital (Lamont et al. 2001, Malmendier and Tate, 2004; Baker et al., 2003; Kaplan and Zingales 1997). This method was employed by Malmendier and Tate (2008) in order to construct an index that is defined as:

$$KZ = -1.001909 \times \frac{\text{Cash Flow}}{K} + 0.2826389 \times Q + 3.139193 \times \frac{\text{Debt}}{\text{Total Capital}} - 39.3678 \times \frac{\text{Dividends}}{K} - 1.314759 \times \frac{\text{Cash}}{K}^{14}$$

Source: Peters (2017), p25

Considering that there will be a high probability of interaction between overconfidence and abundant internal resources, also the term OVERCONFIDENCE×KZINDEX is added to the regression. As stated at the beginning there are other variables (control variables) that are part of the regression in order to detect whether or not they enter in conflict with M&A activities. The size (SIZE) of a company can be determined in several ways. For example Hirshleifer (2012) indicates it as the natural logarithm of sales and on the other hand Malmendier and Tate (2005a, 2006b) and Harford (1999) calculate the size as the logarithm of total asset at the beginning of the fiscal year. In this model, will be used Malmendier, Tate and Harford approach. In accordance with the study made by McCarthy and Dolsfma (2012) the size of a firm can have a strong impact on M&A transactions. Under their point of view the motives of M&As in smaller companies are mainly value-enhancing ones and thus resulting in small probabilities of value destroying compared to bigger companies. The second control variable in the regression is Tobin's Q (TOBIN), which is determined by dividing the market value of assets for the book value of the assets. The asset's market value is determined by adding the

total asset to market value of equity (common shares outstanding times the fiscal year closing price) and subtracting the book value of equity, while the book value of equity is calculated by multiplying the common shares outstanding times the fiscal year closing price. The third control variable in the model is stock ownership (STOCK OWNERSHIP) and it can be obtained by calculating the following formula that gives the portion of company stock that a manager owns:  $\text{CEO shares ownership} = \frac{\text{number shares held}}{\text{total shares outstanding}}$  (Hirshleifer, 2012; Malmendier and Tate, 2004). From the computation emerges that when an executive holds a substantial amount of company stock he/she is more inclined in serving the interests of the shareholder, thus suggesting a more reluctant predisposition towards hubris (Berger et al. 1997). The fourth variable in the regression refers to executives' compensation (COMPENSATION) and it is calculated by taking the total earnings and option grants. Berger et al. (1997) hold that the more a manager is exposed to be overconfident, the smaller the proportion of fixed compensation compare to variable compensation. This means, the smaller the ratio of fixed compensation to total compensation, the level of CEO entrenchment tends to be higher. The more entrenched a CEO is the more overconfident (Berger et al. 1997). In this study fixed compensational will be defined as salary and total compensation will consist of all compensation including options and bonuses. The last variable included in the model is executives' gender (GENDER). Barber and Odean (2001) demonstrated that gender play a substantial role in this particular issue. In particular, in the regression, gender will be also a dummy variable that will assume value one for female executives and value zero for male ones

### **3.3.2 Results**

The first hypothesis of our test was based on the analysis of whether overconfident executives are more predisposed in conducting M&A activities than non-overconfident ones. The results of the test demonstrate that there is a positive correlation between overconfidence and M&A activities but since the test resulted as being not robust, the first hypothesis has been rejected. Nevertheless the abundance of internal resources in the model gives a positive significant effect on takeovers, which leads in accepting the hypothesis 1b. The second hypothesis was centered on the investigation of whether overconfident CEOs are more inclined towards failing M&A activities. Even in this case, the results demonstrate that there is no robustness, suggesting that overconfidence has no influence on failing mergers and acquisitions, thus

leading to a rejection of all sub hypotheses. By adding in the model the variable that represent the condition of abundant internal resources still no changes can be observed; thus the presence or the absence of abundant resources is insignificant in this context. However in looking in depth at particular industries we can observe that there is one positive correlation between overconfidence and failed M&A activities. In fact, in the telecommunications industry, the percentage of a failed M&A activities related to an overconfident manager is higher. The conclusion of this research suggests that there is no significant positive correlation between managers' hubris and failed M&A attempts.



## Conclusion

When in the course of Corporate Finance we approached the field of behavioral finance I was completely amazed in seeing how the brain played a key role in economic decision making. The aim of this thesis was to give general insights on behavioral perspective that is quite modern. If we look back at the EMH of 1970, I am completely overwhelmed in seeing how until 40 years ago the common vision was the one of economic rationality, thus suggesting that in economic decision-making, mankind was fully certain of its actions. It was only in 1979 thanks to Kahneman and Tversky's Prospect theory that the economic approach to decision making started to change. But still nowadays there are disputes that are not resolved, and this can be seen by the amount of papers that are constantly published with the aim of adjourning the information on how the biases influence corporate decisions. The willingness of this paper was to cover the main mental traps that are currently recognized and how they can have an effect at corporate level. In the analysis of the consequences that mental frames play in managers' life, the overconfidence bias seems to be the one that covers them the most. It has been demonstrated that overconfidence not only can affect corporate decisions regarding projects that in the end result with negative NPV, but also, thorough an empirical statistic study it has been proved that managers that are affected by overconfidence lead firms to exercise financial distress with an higher probability. Moreover a lot of papers illustrated how the press has a huge impact on managers' behavior. In fact, managers that were described as confident and optimistic in the New York Times, in order to protect their reputation, tended to reduce takeover activities thus reducing the probability of financial distress. The intention of the writing of the third chapter was, in fact, on the study of the effect that overconfidence has on M&A activities and precisely on the analysis of the correlation between overconfidence and failing M&A transactions. If from one hand the result of the regression shed light on the positive correlation between overconfidence and takeovers, on the other it resulted in having no connection between managers' overconfidence and failing M&A activities. At the beginning of this paragraph it was stated how the behavioural field is actually a new branch of the more ample economic world. During the study and the subsequent writing of the last chapter, with the previous knowledge that I have assimilated of the behavioural branch, I really expected to find a positive correlation between overconfidence and failing takeovers. My personal point of view based both on the constant

developing nature of this field and on the strong effect that this bias has on corporate members, is that there will be researches that will suggest this result. Brian deChesare in his article “Why Most M&A Deals Fail: Love and Marriage?” wrote something interesting. The rate of failing takeovers is between 50% and 90%, with a median of 70%. He claims that these results are not referring to activities that fail to close, but rather to ones that happens and didn't work in the end. So why are these percentages so high? To understand the main reasons, he continues, think about a real life example: marriages. The divorce rate is actually very similar to the one of M&A activities, that is around 50%, and yet many people still get married. Now, think about the main reasons of divorce, those are: cultural mismatch, romance, lack of knowledge, financial motifs and so forth. Actually all of these reasons can be easily applied to M&A transactions. This results however, in managers that continue to enter in takeover activities leading their companies to a disruption of value in more than 50% of the cases. This can be connected again with my personal viewpoint of overconfidence. Still, as the nature of failing marriages' motifs can shed light on a broader cause that is innate in humankind, the choice of entering in M&A activities that result with negative outcome can actually be the result of the same reason. People, in most of the cases tend to postpone the analysis of the consequences with the aim of not facing the truth. As for marriages that end with divorce, can be recognized an initial willingness to overcome the lack of emotions with the creation of a family unit, this happens also in those takeovers that aim at the creation of potential synergies but in the end result in a complete failure. People are too overconfident and too optimistic about the results. These characteristics are difficult to measure using analytical tools, as it was for the moneyness of the options used to determine managers' overconfidence, and in my opinion is more difficult to assess whether or not these characteristics can have an impact on daily actions. People and so do managers, are not machines that behave with a perfect scheme, but for sure the behavioural field along with the neurological branch applied to finance, will continue to study humans' biases connected with economic decision making in order to constantly adjourn this new developing world.

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