

Decision-Making Process under Risk and Uncertainty

The Role of Managerial Optimism: A Theoretical Approach

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Abstract

Does managerial optimism help to explore and understand corporate decision-making process under risk and uncertainty? How decision-makers perceive risk and how this perception affects firm's real outcomes? These are only a few questions that have intrigued us to investigate in depth the context of behavioural corporate finance, decision-making process as well as uncertainty and risk; some major themes in finance and economics. In this study we try to investigate some important aspects of the theoretical background as a starting-point for further research. Some of the most important published studies are presented along with results, methodologies and statistical measures.

Keywords: Managerial optimism, decision-making, behavioural corporate finance, self-attribution bias, business performance

JEL Classifications: D80, D81, G32

1. Introduction

Corporate investment decisions are among the most important decisions that firms have to deal with. To fully understand the investment decision process we have to focus on investment measures such as capital expenditures, investments in advertising, R&D and intangible assets (Glaser *et al.*, 2008) or the impact of mergers and acquisitions on shareholder wealth. Investment decision process encompasses risk. Managers have to make decisions that are more or

less risky. Moreover, better decisions are made when there is sufficient knowledge regarding the mechanism of decision making as a great step to risk control management. How managerial optimism as well as other psychological biases affect a firm's investment decision process? Is there an optimum procedure risk - averted or not in order to achieve the best investment opportunities for a firm? These are the main questions we tackle in this paper in order to read into the investment decision process.

People, including managers and business leaders, normally associate the quality of a decision with the quality of the result. When managers observe a good result, they believe that they made a good decision. However, decisions and results are two different things. Decisions are made at a specific moment in time; in the event, people apply these decisions, and the result is observed in the future which seems normally uncertain. In the future, events can happen that managers and firms cannot control. Moreover, events can happen that managers cannot foresee. Such events can cause good decisions to have a bad result - and vice versa. Therefore, the quality of the result is not demonstrative of decision quality, and the result is irrelevant as a measure of decision quality.

Of course, results are not irrelevant for firms and managers. The manager is eventually responsible for the good results for the firm, a responsibility to the stockholders who demand good results. But what can firms do to achieve good results? Firms usually do two things to achieve, on average, better results. First of all, they implement a good process. Managers have to learn to become better business executives. They can learn the process of decision making, learn how to be better in performance and manage their firm via knowledge and experience which are imperative in decision making process. Second, firms try to manage the risk in any single business project. That is why the manager must be act responsibly for the overall results of the firm.

The starting point when analysing corporate investment policy decisions is commonly that a firm's investment should depend exclusively on the profitability of its investment opportunities. However, the evidence over the last years strongly shows investment depends on cash flow too (investment - cash flow sensitivity). A rush of cash flow leads to the result that managers invest too much (Glaser *et al.*, 2008). Based on the asymmetric information theories anyone might realise that managers themselves restrict external financing in order to avoid issuing undervalued shares. Recently many behavioural corporate finance theories have been found based on managerial biases in order to explain corporate decisions. Although there is a huge behavioural finance literature in investor behaviour, there is a little empirical research in behavioural corporate finance.

According to Tombaugh (2005) optimistic managers are more likely to see problems as challenges as well as opportunities, strive for longer periods to reach their goals, and search for and appreciate the positive aspects of difficult situations. Therefore, optimism generally influences work and eventually firm performance. Does managerial optimism play an important role in corporate decision making? Do overconfident managers act in the interests of their shareholders preserving their wealth? The overconfidence hypothesis states that managers are simply overconfident and over-invest (Doukas and Petmezas, 2007). They claim that are superior and more powerful than others. However, due to their overconfidence profile they tend to devalue the risks and often make destructive decisions for their firm. Therefore is overconfidence driven by managers' self attribution bias? All the above questions are going to occupy us trying to understand the power of managerial optimism in decision making process and the existence of self-attribution bias while tackling corporate investment policy decisions.

J. B. Heaton (2002), stated that two extremely important features emerge from a simple model of corporate finance with optimistic managers and efficient capital markets. First, optimistic managers state that capital markets undervalue their firm's risky securities, and may decline positive net present value projects that must be financed externally. Second, optimistic managers overvalue their own corporate projects and may want to invest in negative net present value projects even though they are feeling loyal to their shareholders eventually being related to free cash flow without appealing to asymmetric information or rational agency costs.

2. Theoretical background

Since the seminal work of Modigliani and Miller (1958), much research effort has been directed at understanding firms' capital structure and investment decisions, and the corresponding effects on firm value (Fairchild, 2007). Until recently, the standard approach was to assume rationality of managers and investors. A large part of research examines the role of signalling regarding informational asymmetries in a rational framework (Leland and Pyle 1977; Ross 1977). Another large part of research explores the use of capital structure to mitigate agency problems (Jensen and Meckling 1976; Jensen 1986; Fairchild 2003). This approach assumes a principal-agent problem based on selfish managerial rationality and overconfidence.

The cognitive psychology literature argues that most people usually display optimistic expectations about the future. On one hand, individuals are more optimistic when they believe that they control positive outcomes and when they are highly committed to them (Weinstein, 1980). Managers on the other hand are more optimistic when they control their firm's performance and they feel committed to this good performance because their personal wealth, employability as

well as reputation are highly dependent on it (March and Shapira, 1987; Gilson, 1989). Given their leadership positions and managerial compensation, managers are likely to have an important impact on their firms' success (Kaplan *et al.*, 2008).

There are many economic theorists that model managers or agents who run firms. Some of them, like Holmstrom (1979) consider all managers or agents as being the same and mainly focus on effort supply. However in such theories individual manager does not matter. Some other theorists consider managers as individuals having different talents and abilities which eventually influence firm's performance. Are therefore personal characteristics of all senior managers together perhaps a better indication of a firm's decision making process than the CEO's characteristics alone? This is the question that Glaser *et al.* (2008) tackle in their paper empirically for the case of managerial optimism and corporate investment.

Glaser *et al.* (2008) investigate how the exact decision process works within a firm, because corporate investment decisions are part of economic policy public conversation as economic development depends evidently on corporate investment. Behavioural corporate finance models are also being confirmed in their study since finding that managers are in fact optimistic and increase their exposure to company risk. Optimistic managers tend to invest more. However, the possible case of overinvestment due to overconfidence and managerial optimism may be a source of long -run underperformance.

In his seminal paper regarding optimism Roll's (1986) hubris hypothesis suggests that managers share an overly optimistic opinion of their competence to create value. However, Billett and Qian (2005) stressed the importance of how do managers become overconfident. The psychology and behavioural economic literature underline self-attribution bias as the most common source of overconfidence. In Malmendier and Tate (2005) overconfidence is equal to overoptimism. Overoptimist managers overestimate the returns of their investment decisions and regard external funds excessively costly. Optimistic managers are at higher risk because they use to overestimate the future cash flows of their decisions.

Behavioural corporate finance (BCF) examines the impact of managerial psychological biases on a firm's corporate finance decision process. Traditionally, scholars have based their research assuming that managers are fully rational. However they also recognised that psychological biases of managers affect decision - making in financial markets and firms. Consequently, behavioural finance has emerged as a challenge to the traditional example during the last years. Behavioural finance is a complete approach that connects finance, psychology and sociology. Financial psychology research has shown that human cognitive biases have many irrational components, even when humans try to make rational decisions. The cognitive

delusions therefore are more likely to affect investment decision process (Kahneman and Riepe, 1998).

A very interesting aspect of BCF is the effect of group behaviour on decision - making. Groups usually amplify individual errors. This is an extremely significant finding for corporate managers, in that the major part of firm investment decisions are made in groups. There are also many other behavioural applications to corporate finance besides group behaviour. For instance, overconfident managers may underestimate the probability of transgression, and as a result make investment decisions with overly debt - heavy capital structure. In the traditional approach to corporate finance managers tend to act as if markets were efficient. For example there is a general acceptance that managers appear to act as if markets do have memory; managers like to take risks and issue new stock only after the firm's price has risen. Behavioural finance offers directive guidelines for managers when the stocks' price is mispriced. These guidelines suggest that there are some cases in which managers should regulate hurdle rates and other cases in which they should not. From this point of view capital budgeting process and policy is more complex even when stock prices are efficient.

Glaser *et al.* (2008) stressed that there are two important and necessary conditions for a positive relationship between managerial optimism and risk - taking, pure chance related risk and imprecise probabilities. Apparently, this means that there is no relationship between optimism and risk - taking. However, in decision process it is difficult to relate optimism and the level of risk tolerance regarding tasks where risk is skill-related. Moreover, managers tend to be risk-averse in domains of gains while risk - loving in domains of losses, a result that looks compatible to Prospect Theory, where loss aversion refers to individuals' tendency to strongly prefer avoiding losses to acquiring gains, as first convincingly. However, recent studies have questioned the existence of loss aversion. The process of making investment decisions is mainly based on the "Behavioural Economics" theory which is based on Prospect Theory (Kahneman and Tversky, 1979). A practical risk measure should be practicable to all investment decisions due to the fact that all investments contest for a particular budget. Therefore, one of the objectives of risk measure is to appreciate the investment expected return.

According to March and Shapira (1987) managers use different principles for risk decisions than standard decision theory. Risk is consequently is regarded as a choice based on the expected value of return of a different option. Additionally risk - taking does not seem correlated to adversity. Managers usually do not equate risk with diversity in potential outcomes because they regard risk mostly as a danger. The managerial definition of risk is that a risky decision contains a constant threat of a poor outcome. Hierarchy in management is also very important regarding risk - taking by managers

of different level. Higher level managers are more risk - takers than lower level managers and very often try to encourage lower level managers to take more risk. Managers are completely connected to risk. They regard risk as a substantial role for being successful. Traditional corporate investment process has a top - down structure. Managers at the top are responsible and decide the investment strategy and decisions in the near future. Moreover managers see risk - taking as a thrilling and dangerous process. They believe that lower risks should be taken during optimistic situations but on the other hand organisational survival should not be risked. In other words they tend to risk more when they possess more.

Doukas and Petmezas (2007) examined whether managerial overconfidence regarding decisions on mergers and acquisitions affects shareholder wealth. They also examine thoroughly the important role that managerial overconfidence plays in explaining the performance of mergers. The overconfidence hypothesis states that managers are overconfident and over-invest. They also feel that are superior regarding others and more competent. Specifically, overconfident managers strongly believe that future merger outcomes are mainly under their control. A Chief Executive Officer (CEO) who suffers from delusion of control is more probable to be heavily optimistic about the future outcome of a merger. Malmendier and Tate (2004 and 2005) also tried to demonstrate that overconfidence helps explain merger decisions. Positive CEO beliefs based on overconfidence and risk-seeking decisions emerge as the most well-defined ways to integrate private investment and corporate merger decisions.

Finally regarding firm investment and optimistic managers, Glaser *et al.* (2008) underlined the fact that managerial optimism gives an explanation for corporate investment even when other variables are controlled for. This is mainly driven by managers' optimism regarding capital expenditures. The effects of managerial optimism on capital expenditures are stronger in small firms as well as stocks with a low percentage of closely held shares. Still regarding acquisitions there is a difference between the fact that all managers decide together as a group and an individual manager deciding alone. Optimism of all managers significantly increases the probability of an acquisition whereas single manager's optimism alone does not.

3. Main studies and results

Some important empirical evidence comes from Lin *et al.* (2004) regarding managerial optimism and corporate investment in Taiwan. They examine the relation between managerial optimism and corporate investment decision making. They used a sample of companies listed on the Taiwan Stock Exchange (TSE) and the Over the Counter (OTC) during the period from 1985 to 2002. The scope of their measures is based on management forecasts for earnings before tax. Their main purpose is to construct a managerial optimism measure on a personal basis. A managerial forecast is weighted equally and is defined as upward-

biased in case the forecast error is positive. Their results indicate that managerial optimism may act as a possible reason for the upward-bias in management forecasts in Taiwan. Optimistic managers in Taiwanese companies display higher investment - cash flow sensitivity than non - optimistic managers. They also exclude the possibility that the result is influenced by the traditional agency and information asymmetry explanations. Finally, their study makes a contribution by offering evidence of an alternative source from which corporate decisions are effected. The evidence suggests that managerial optimism plays an important role in corporate investment decisions.

Billett and Qian (2005) examine the source of managerial hubris in mergers and acquisitions by exploring the history of deals made by individual acquirers of US publicly traded companies. They propose that there exist two different trends in acquisitions. First managers who become overconfident from past successful experience are more likely to acquire again and second these overconfident managers will do worse in their following acquisitions stemming from this overconfidence. They test these two trends using a sample of acquisitions from 1985 to 2002. They explore the past of these active acquirers in order to test the predictions of the self-attribution and other significant hypotheses. Overall, their evidence proposes that self-attribution bias plays an important role in the overconfidence of acquirers. The evidence is consistent with the notion that acquirers with no acquisition past experience show no evidence of overconfidence. On the other hand managers with frequent acquisitions exhibit negative wealth effects consistent with overconfidence. They also examined the acquirer's long - term stock performance following the acquisition. They also found that under the self - attribution hypothesis, managers who misunderstand their past - acquisition performance become overconfident. Their study adds to the empirical literature of behavioural finance by demonstrating evidence that overconfidence in acquisitions is developed from past acquisition experience.

Malmendier and Tate (2004) revealed that overconfident managers overestimate their ability to generate positive returns for their firms. Positive manager beliefs and risk-seeking preferences reveal as the most direct way to link manager private investment and corporate merger decision making. They use a sample of 394 US firms from 1980 to 1994. They constructed a model in order to demonstrate the effect of overconfidence on mergers. Using this model they showed that overconfident managers overpay for target companies and decide to undertake value-destroying mergers. The model shows that the effect of overconfidence on the frequency of mergers is ambiguous, but on the other hand overconfidence has strong implications for merger quality and financing. Their results proved overconfidence as a significant part of the theory of corporate mergers. An important contribution of their research is that they directly measured which managers are prone to overconfidence and they demonstrated that these

are the managers who destroy the value for their shareholders' wealth.

Uncertainty and risky choices are a very important theme in finance and economics. Due to the limited empirical work that explores how decision makers perceive risk and how their decisions affect real outcomes, Ben-David *et al.* (2006) try to link managerial overconfidence with corporate policies. They draw their overconfidence measure from survey data. During 2001 to 2006 they have surveyed US CFOs and asked from them to predict one and ten-year market equity returns. Furthermore, they analyse the relation between their overconfidence measure to corporate policies (investments, financing, financial reporting and executive compensation). Most of their results are consistent with the predictions of the theoretical literature regarding overconfident managers. They document that firms with overconfident managers conserve higher debt ratios and longer debt maturity, pay out fewer dividends and invest more heavily. Their study is based on stock market predictions by managers in quarterly surveys conducted by Duke University between 2001 and 2005. Their overconfidence measure is constructed in order to recover managers' individual probability distribution. This study empirically explores whether managers are indeed affected by cognitive biases with respect to their own perception of risk and uncertainty. Finally, their results regarding corporate actions suggest that managers' overconfidence might be linked with the behaviour of other decision makers in the firm.

In Doukas and Petmezas (2007) we find empirical evidence regarding overconfident managers as acquirers and self-attribution bias. They examine whether overconfident managers as acquirers act in the interests of their shareholders. They explore a sample of 5334 successful acquisitions by UK public companies from 1980 to 2004. The short-term analysis is based on abnormal returns around the date of the announcement. They calculate cumulative abnormal returns (CARs) for the five-day period. On the other hand, the long-term analysis is conducted by estimating abnormal returns. Consistent with Malmendier and Tate (2004) they provided additional support for the prediction that overconfident managers fail through trying to generate superior abnormal returns as well as evidence that self-attribution induces managerial overconfidence. Finally, they found that managers tend to take the credit of a successful acquisition and therefore become overconfident.

Finally, important empirical evidence comes from the research of Glaser *et al.* (2008) who examined the link between managerial optimism and corporate investment and whether the CEO is the only responsible for this relation. They found that managers are optimistic and often voluntarily increase their exposure to risk. In addition to that firms with optimistic managers tend to invest more, while the investment-cash flow sensitivity is higher for firms whose managers are optimistic. Their optimism measures are based on

transactions of members of the Executive and Supervisory Board on their personal accounts. During the period from 2001 to 2006 11,241 insider transactions were used in their empirical analysis in order to be able to confirm behavioural corporate finance models.

4. Discussion and Conclusion

Although corporate investment has been of great interest for researchers for many years, research linked with behavioural corporate finance, psychology and investment decision process is quite limited especially in Europe and more specifically in Greece. Moreover since the mechanism of investment decision process is crucial for firms we hope that this study will demonstrate several ways in which managers could tackle with risk and personal, psychological biases in order to achieve greater outcomes. The implementation of Risk Management in corporate investment decision process is of great interest because risk is associated with any form of finance and investment.

Apparently it is crucial to examine the effect of losses in decision making under risk and uncertainty. It intrigues us to extend our research specifically in Greece because capital markets in Greece are still in an early stage. It is generally admitted by academicians and businessmen that the theory as well as practice of financial management and corporate investment in Greece is somewhat primitive compared to the North American standard. The only stock - exchange in Greece, the Athens stock exchange, is almost motionless. Low savings rates and unsophisticated managers and investors are the chief reasons for the narrow financial markets.

Therefore, our basic aim is to appreciate the present understanding of corporate investment decision process, to examine in depth its mechanism, analyse managerial psychological biases such as optimism and risk aversion to examine risk management and its impact on corporate investment process and to update the research attempts worldwide, and especially in Europe, on corporate investment policy. Since no study has been yet conducted in Greece regarding the impact of behavioural corporate finance and risk managerial perspectives on corporate investment policy, we intend to empirically examine what drives managers to make decisions either risk-free or risky. We aim to use a unique sample of managers of both private and public sector in Greece in order to investigate whether managerial optimism may analyse how the strict decision process works within a firm. Finally, we intend to explore, analyse and compare the results with other in other countries and make considerations and suggestions for Greek managers.

A key issue in the study of psychological biases is to identify the sources of biases. We are interested in finding what affects managers and which the determinants of managerial optimism and overconfidence are. In the psychology literature it is being argued that confidence

in judgment is formed due to a process of "learning" about own judgmental abilities (Ben-David *et al.*, 2006). In a model by Einhorn and Hogarth (1978), decision makers "learn" about their own confidence by observing the outcomes of past decisions and generally firm's past performance. Therefore, we intend to explore the relationship between survey managers' forecasts and future and past return realisations. We are also interested in incorporating in our model the personal and economic determinants of managerial optimism, as well as the firm's culture and characteristics like firm age, profitability, sales growth, size, and executive optimism about the firm and the Greek economy which in general may create overconfidence. We will base our study on stock market predictions by managers of both public and private sector in quarterly surveys. Based on the method of Ben-David *et al.* (2006) we will base our optimism measures on the idea that the confidence bounds around point estimates reflect the individual probability distribution.

According to Ben-David *et al.* (2006), overconfidence is having a narrow confidence interval and is being correlated with personal characteristics as well as it is also stronger following periods of high returns in their firms. Individual probability distribution will be recorded using the model proposed by Davidson and Cooper (1976) as well as by Keefer and Bodily (1983). We also intend to explore the association of overconfidence with a variety of corporate policies. Theoretical literature about optimistic managers (Roll, 1986; Hackbarth, 2004; Gervais, Heaton and Odean, 2005) indicates that optimism is associated with both personal traits and firm culture.

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