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# Managerial optimism and the impact of cash flow sensitivity on corporate investment: The case of Greece

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**Abstract**

***Purpose-***The existence of optimism as a personal psychological characteristic of managers is a necessity in contemporary economy and decision making, although the phenomenon of over-optimism may lead to unfavourable outcomes. The purpose of this study is to examine the optimism bias and its impact on the firms' future performance. Especially regarding the recent years where Greece faces increased economic depression, high percentages of unemployment and lack of budgetary discipline, the goal is therefore, to find whether managerial optimism has an impact on corporate investment of Greek firms.

***Design/methodology/approach-***The investment of firms with optimistic managers is more sensitive to cash flow than the investment of firms with managers who are not optimistic. To test the research question a number of fixed effect panel regressions of capital expenditures (capital expenditures divided by lagged assets is the dependent variable) is run. In all regressions we analyse cash flow divided by lagged assets and lagged Tobin's Q as the independent variables, for firms whose managers are classified as optimistic and not optimistic. This classification is based on the optimism "dummy" variable, which is equal to 1 when members of the Executive Board and the Supervisory Board (ALL), only the Executive Board (EB), and only CEO are classified as optimistic. The concept of this study is tested for firms which are listed in the Athens Stock Exchange. A total of 243 firms are recorded, for the time period between 2007 and 2012, including firms from 11 different industries; basic materials, chemicals, consumer goods, consumer services, health care, industrials, financials, oil and gas, technology, telecommunications, and utilities. Based on the literature and on related methodology aspects, financial firms are excluded.

***Findings-***It was revealed that managerial optimism affects corporate investment in firms with high degree of closely held shares. Moreover, managerial optimism is never linked to corporate investment regarding firms which belong to middle degree of closely held shares. Additionally it is proved that decisions for acquisitions are not affected by the manager's optimism regarding the prospects of his / her firm. This result it is not consistent with results of previous literature like Malmendier and Tate (2008) and Glaser et al. (2008) who have been found that cash flow, Tobin's Q and firm size mainly drive the probability of an acquisition. Finally, it is confirmed that investment of firms with optimistic managers was found to be more sensitive to cash flow than the investment of firms with managers who are not optimistic. Optimism was proved to be extremely effective concerning investment.
***Research limitations/implications-***A possible proposal for further research could be the testing of each year separately. In this study we have run the regressions for the whole of the 6-year period of 2007 to 2012. However, testing each year individually could provide researchers with the ability to compare different results, to find out whether there was anything special statistically for each specific year and maybe test the period after the year 2010 when the Greek crisis had started to come up on the horizon. The impact of the Greek financial crisis on managerial behaviour and on the personal characteristics of managers like optimism could constitute a field for further research.
***Originality/value-***Since research on this specific field of finance is quite limited; this study aims to add value on the existing knowledge on the Greek case. The investigation of managerial optimism as a personal, psychological and mental characteristic encloses the effort of Greek managers to come out of the economic crisis and consequently achieve greater outcomes for their firms.

**Key words:** Managerial optimism, optimism measures, corporate investment

**JEL classification:** D80, D81, G31, G32

**1. Introduction**

Recently, economists have increasingly implemented psychology to their research. One of the most frequently used personal characteristics of human behaviour is the presence of optimism and overconfidence in corporate investment decision making. According to Langer and Roth (1975), Miller and Ross (1975) and Nisbett and Ross (1980) individuals tend to account their success basically on their own personal abilities and characteristics due to the presence of optimism, whilst success mainly is in fact accounted due to random events.

Analysing a number of important studies of the related contemporary literature (Malmendier and Tate, 2005a, 2005b; Lin et al., 2005; Martin, 2008; Glaser et al., 2008; Michel, 2009) it is found that research regarding the case of Greece is somehow limited. Actually, this study is the first to address the field of managerial optimism and its impact on firm performance. Trying to fill this research gap, this study aims to investigate managerial optimism and its impact on corporate investment in Greece. Evidently, there is a need of more work to be done on this field. The Greek case is definitely worth of being concerned with, since it provides possible researchers with unexplored fields of research.

Historically, managers of Greek companies are used to be facing difficult situations due to the tough conditions that Greek economy faces in the passage of time. Years of great depression, post-war effects on political stability, social justice, as well as hard financial conditions were often the implications Greece had to cope with across the years. According to Bloom and Van Reenen (2010) variations in management practice is a reason for the existence of large differences in productivity between firms and countries. Across the seventeen countries they investigate, Greece is at the bottom, having the lowest management scores along with developing countries, like India, Brazil, and China.

Additionally, during the last years, Greece still faces extremely difficult situations due to the lack of budgetary discipline, increased depression, and high percentages of unemployment. According to Kouretas and Vlamis (2010) the financial crisis in Greece in 2008 has caused a significant increase of public debt. The current situation of Greece seems to be due to the existence of a weak political system along with the weakness of financial markets to predict the 2007 sub-prime mortgage loan crisis. Therefore, the role of managers in Greece is extremely aggravated with the responsibility of coping with these difficult situations as well as the eagerness to succeed in their role; the development of Greek companies, the improvement of their performance, and the maximisation of shareholders' wealth.

## 2. Theoretical Background

### 2.1 Overconfidence and optimism

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. 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; Fried, 2000). 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., 2012).

The notion that specific managers may be overconfident regarding their own abilities to manage, the selection of upper investment projects and the precision of their knowledge are encouraged by psychological studies of judgement. The most significant finding in this area of study is the phenomenon of overconfidence (Tversky and Kahneman, 1986). They simply argue that overconfidence consists of factors such as the illusion of control, insensitivity to predictive accuracy, self-enhancement tendencies and finally misunderstanding of chance processes. All the above mentioned causes of overconfidence apply to the managerial decision making of mergers. Griffin and Brenner (2004) argue that all concepts that characterise overconfidence are linked.

Malmendier and Tate (2008) prove that managers who are affected by hubris are more prone in engaging in acquisitions and realise the consequences of the worse performance than do managers who are not

affected by hubris. It is important, therefore, to underline the importance of the opinion that Baker, Ruback and Wurgler (2006) have earlier expressed that the phenomenon of the irrational manager and the phenomenon of the irrational investor will always exist together. Rosen (2006) on the other hand suggests that managers and investors may be affected by the same *hubris*, and therefore managers usually tend to overestimate the possible benefits from the merger, which probably will influence the outcome of the deal in a negative way. On the contrary, non-overconfident managers may enhance shareholders' wealth due to the fact that they carefully negotiate and conduct their deals.

Glaser et al. (2008) argue 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. According to Kahneman and Tversky (1979a, 1979b) 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. However, recent studies have questioned the existence of loss aversion (Erev, Ert and Yechiam, 2008; Ert and Erev, 2008; Nicolau, 2012).

Finally, regarding firm investment and optimistic managers, Glaser et al. (2008) underline the fact that managerial optimism gives an explanation for corporate investment even when other variables are controlled for.

**2.2 Managerial optimism and corporate investment: Past methodologies and findings**

Heaton (2002) applies a simple three date-two period model aiming to come up with two dominant features of corporate finance with excessively optimistic managers as long as efficient capital markets are considered. These features consist of the notion that optimistic managers' undervaluation and overvaluation of their own corporate projects can lead to declining or investing in negative net present value projects even though when managers are faithful to shareholders. Heaton's (2002) approach stems from the standard assumption of managerial rationality in corporate finance. Despite the little work made in corporate finance, the assumption was dropped regarding managerial full rationality. However there are exceptions like Roll (1986), DeMeza and Southey (1996) and Boehmer and Netter (1997). Roll (1986) addresses the significance of the hubris hypothesis serving as a null hypothesis of corporate takeovers.

Malmendier and Tate (2008) try to explain merger decision making using managerial overconfidence and their overestimation of their own ability to generate returns. They use a simple model to show that overconfident managers overpay for target companies and undertake value-destroying mergers. In order to isolate the significance of overconfidence they assume a market with symmetric information between managers and external investors and common interests between managers and shareholders.

Lin, Hu and Chen (2005) examine the relation between managerial optimism and corporate investment decisions. They base their work on the hypothesis that in constrained firms, the investment cash-flow sensitivity is larger regarding optimistic managers than non-optimistic managers. In the Heaton (2002) model as it was mentioned above, optimistic managers overestimate both investment projects and eventually firms. As a result optimistic managers tend to invest more than non-optimistic ones do with internal funds.

Consistent with the view of Bertrand and Schoar (2003) and Malmendier and Tate (2005a), Ben-David et al. (2007) stress the importance of the association of

overconfidence with both personal traits and firm culture. They find that overconfidence is related to personal traits and characteristics of managers such as skill, experience and educational level. Overconfidence of managers is correlated with market-wide and firm-specific factors which could affect any other executives in the firm as well as with corporate decisions like investments which are shared with other executives.

Martin (2008) investigates if and to which extend managerial behaviour and behavioural biases can influence the possible underperformance of firms, including behavioural explanations as well as rational theories. Their sample consists of initial public offerings (IPOs) and seasoned equity offerings (SEOs) recorded by the Security Data Company (SDC) during the years from 1990 to 2001. For each firm in their sample they collect the insider trading data and they examine all open market transactions. They consider two distinct time periods to analyse the trading behaviour of insiders, trading before (six months before the equity issuance) and trading after (beginning from the end of the look-up period for three months).

Finally, Graham, Harvey and Puri (2012) try to provide evidence based on psychometric tests on CEOs regarding personal or behavioural traits like managerial risk aversion, optimism and time preference all related to corporate financial policies. They create an initial survey instrument which is based on existing theoretical and empirical research. They survey both CEOs and CFOs. The largest group of CEOs was around 10,000 executives who subscribe to Chief Executive Magazine. In total they surveyed approximately 10,700 CEOs.

## 3. Methodology

### 3.1 Research question

The investment of firms with optimistic managers is more sensitive to cash flow than the investment of firms with managers who are not optimistic. To test research question a number of fixed effect panel regressions of capital expenditures (capital expenditures divided by lagged assets is the dependent variable) is run. In all regressions we analyse cash flow divided by lagged assets and lagged Tobin's Q as the independent variables, for firms whose managers are classified as optimistic and not optimistic. This classification is based on the optimism "dummy" variable, which is equal to 1 when members of the Executive Board and the Supervisory Board (ALL), only the Executive Board (EB), and only CEO are classified as optimistic.

### 3.2 Sample

The concept of this study is tested for firms which are listed in the ASE. A total of 243 firms are recorded, for the time period between 2007 and 2012, including firms from 11 different industries; basic materials, chemicals, consumer goods, consumer services, health care, industrials, financials, oil and gas, technology, telecommunications, and utilities. Based on the literature and on related methodology aspects, the decision made was to exclude financial firms (Malmendier and Tate, 2005a, Lin *et al.,* 2005; Glaser *et al.,* 2008). Financial firms compile their annual reports in different ways and based on different standards compared to the other firms.

Therefore, financial firms are excluded in order to avoid differentiations which may conclude to vague and not precise results. Compared to companies of other industries financial firms come up with a different analytical problem. In order to analyse a financial firm's financial statement there is a need of a different approach which mainly has to capture the particularity of financial firms' unique risks (http://www.investopedia.com/articles/stocks/07/bankfinancials.asp). Overall, this work gathers data on 184 non-financial firms.

The sample is unique regarding this area of investigation. It is the first study examining the Greek case. Optimism as a managerial bias in Greece has never been the subject of research. This was initially the

motive for us to engage with this specific area of study. Since corporate behavioural finance research is limited in Greece the decision was to extend the study in order to come up with useful results. Greece during the recent years leading to this study faces serious financial problems. The generalised European crisis which seriously affected Greece has also spread its effects on the rest of European countries.

The unique sample of Greek non-financial firms listed in the ASE was tested in order to produce useful results. These results may be extremely important for managers of Greek companies in order to overcome the difficulties they face. The narrow bounds for investment and rising of firms, the general financial crisis of public as well as private sectors, make the role of Greek managers much more difficult. Therefore, the firm sample is multi-faceted. It consists of firms from 11 different industries and sectors in order to incorporate the whole substance of optimism. The process is to exclude financial firms due to the differences in the way they compile their annual reports. Thus, the 184 non-financial sample firms will be the starting point for the research, in order to produce significant results and add to the existing knowledge on this subject.

**3.3 Stock market and balance sheet data**

Data is gathered from the stock market as well as from balance sheets and cash flow statements for all firms of the sample. Focus is placed on every firm's annual report in order to gather all necessary data for the methodology. The next step is to classify stock prices on an everyday basis for all firms for the years from 2007 to 2012. Data is accessed from the ASE and is accumulated for every sample firm. Balance sheet data is necessary in order to formulate the basic variables that will be used in regression analysis. Balance sheet data is gathered from the web pages of all firms and is accumulated on an annual basis.

Basic regressions are run from 2005 to 2012 in order to have an analysis of the effects of managerial optimism on subsequent corporate investment, aiming to see if there is something special about the period of interest in terms of investing conditions. The main data source for stock price data is the ASE. ASE is the primary data source of studies that analyse corporate decisions in Greece.

The main balance sheet items that are used is cash flow, capital expenditures (CAPEX), CAPEX over lagged assets and Tobin's Q. Tobin's Q is calculated the same way as in Baker, Stein and Wurgler (2003). Tobin's Q is the number of shares outstanding multiplied by the share price, plus assets, minus the book value of equity over the assets. Q is calculated at the beginning of a firm's fiscal year as in Kaplan and Zingales (1997). CAPEX is used because they clearly may indicate some major financial decisions for a company since CAPEX are expenditures that create future benefits, that is to acquire or upgrade physical assets like property, buildings, equipment etc. This work's variables are calculated for all the years from 2007 to 2012 for each firm of the sample.

The main elements of firms' annual reports that are used are: total assets, lagged Tobin's Q, cash flow, CAPEX, EBITDA, firm age, sales growth, cash, pay-out ratio, pay-out ratio in, excess value, leverage ratio, capital, industry sales growth, debt ratio, dividend payment, dividends per share, and cash holdings.

**3.4 Directors' dealings data**

As already mentioned, in order to construct the optimism measures, data on the transactions of the Executive and Supervisory Board of Greek firms on their personal accounts is needed. Directors' dealings often attract more attention because of the insider knowledge directors and managers may have about the firm's prospects. However, this work is not concerned with insider trading. Managers of course can assess the company's value from the inside more easily than others but this is not an indication that the transaction will be absolutely successful.

Directors' dealings data is obtained from Directors Deals – Global Data & Analysis, a specialised global data market company which analyses and monitors all share transactions made by directors in the shares of their own company. Therefore, this work uses all the available data regarding the Greek case for the period of 6 years (2007 to 2012). During this period a total of 18,575 directors' dealings are reported. Due to the fact that this study focuses on the transaction behaviour of individuals, all transactions that were executed by legal entities are excluded. The procedure is to maintain only the transactions that are described as buys or sells and exclude awards, contract buys, transfer ins and outs, transfers, div re, exercise, sale-post exercise, given away and subscribe.

**3.5 Optimism measures**

Based on the transactions described above, four measures of optimism will be constructed as Glaser *et al.* (2008) have earlier done it. The starting point is assigning the directors' dealings to each company. For each year and company we assess the number of purchases, the number of sales, the volume of purchases and the volume of sales accordingly. This has as a result to accumulate on an annual basis the number of purchases and sales and the volume of purchases and sales. The result, therefore, is an annual "number" and "volume" variable. As discussed previously, these variables include insider action of members of both Boards Executive and Supervisory. The explanation for incorporating the research insider action of the Supervisory Board too, is pretty straightforward. Usually, former Executive Officers become members of the Supervisory Board. Thus, they influence important decisions regarding investments and corporate actions.

**3.6 Regression models**

**3.6.1 Managerial optimism and Corporate Investment**

A multiple regression equation is used in order to examine the relationship between managerial optimism and corporate investment. As dependent variable capital expenditures divided by lagged assets is used. As independent variables the choice was to take cash flow divided by lagged assets, lagged Tobin's Q, leverage ratio, the natural logarithm of total assets, sales growth, and managerial optimism.

For the dependent variable CAPEX/lagged assets (dependent or criterion) and the independent variables (independent or predictors) that were mentioned above, the regression equation that arises with the use of the least square methods has the next form:

$$\text{CAPEX/lagged assets} = \beta_0 + \beta_1 \text{CF/lagged assets} + \beta_2 Q + \beta_3 \text{Leverage} + \beta_4 \ln(\text{total assets}) + \beta_5 \text{Sales Growth} + \beta_6 \text{Opt} + \varepsilon$$

CAPEX/lagged assets= the values of the dependent variable
CF = cash flow
Q = lagged Tobin's Q
Leverage = leverage ratio
Opt = managerial optimism measure
$\beta_0$ = constant
$\beta_1$, $\beta_2$, ..., $\beta_6$ = coefficients
$\varepsilon$ = the error term

**3.6.2 Managerial optimism and Corporate Investment: Dependence on firm size**

A multiple regression equation is also used in order to examine the relationship between managerial optimism and corporate investment with dependence on firm size. As dependent variable, capital expenditures divided by lagged assets are used Independent variables considered are cash flow divided by lagged assets, lagged Tobin's Q and managerial optimism. The categorisation of the sample firms into large and small is done as follows: large firms have above median total asset values, while small firms have below median total asset values.

For the dependent variable CAPEX/lagged assets (dependent or criterion) and the independent variables (independent or predictors) that were mentioned above, the regression equation

that arises with the use of the least square methods has the next form:

CAPEX/lagged assets = $\beta_0$ + $\beta_1$CF/lagged assets + $\beta_2$Q + $\beta_3$Opt+ ε

CAPEX/lagged assets= the values of the dependent variable

CF = cash flow

Q = lagged Tobin's Q

Opt = managerial optimism measure

$\beta_0$ = constant

$\beta_1$, $\beta_2$, ..., $\beta_6$ = coefficients

ε = the error term

**3.6.3 Managerial optimism and Corporate Investment: Dependence on Ownership Structure**

The ownership structure is defined by the distribution of equity based on votes and capital but also on the identity of the owners of equity in the firm. As a proxy for ownership structure this work classifies the sample firms accordingly to their varying degrees of closely held shares (in per cent of shares outstanding). This variable stands for shares that are held by insiders. It consists of, not restricted though, shares held by officers, directors and their immediate families, shares held in trust, shares of the firms held by any other corporation, or shares held by individuals who hold 5 per cent or more of the outstanding shares. The regression equation that arises with the use of the least square methods has the next form:

[CAPEX/lagged assets or (CAPEX-Industry CAPEX)/Industry CAPEX]= $\beta_0$ + $\beta_1$CF/lagged assets + $\beta_2$Q + $\beta_3$Opt+ ε (12)

[CAPEX/lagged assets or (CAPEX-Industry CAPEX)/Industry CAPEX] = the values of the dependent variable

CF = cash flow / lagged assets

Q = lagged Tobin's Q

Opt = managerial optimism measure

$\beta_0$ = constant

$\beta_1$, $\beta_2$, ..., $\beta_6$ = coefficients

ε = the error term

**3.6.4 Optimism and acquisitions**

Acquisitions constitute an aspect of corporate strategy and corporate finance when one observes the buying and selling of different firms that can lead a firm to rapidly evolve and grow. The accounting value of assets from acquisitions is taken from the cash flow statements of the sample firms on an annual basis. The dependent variable equals to 1 if the "assets from acquisitions" variable is positive in a given year. On the contrary, when the "assets from acquisitions" variable is not positive in a given year, the dependent variable equals to 0.

The independent variables of the model are cash flow/lagged assets, lagged Tobin's Q, lagged ln(total assets), and managerial optimism. Therefore, for the dependent variable Assets from Acquisitions (dependent or criterion) and the independent variables (independent or predictors) cash flow/lagged assets, lagged Tobin's Q, lagged ln(total assets), and managerial optimism, the regression equation that arises with the use of the least square methods has the next form:

Assets from Acquisitions = $\beta_0$ + $\beta_1$CF/lagged assets + $\beta_2$Q + $\beta_3$Lagged ln(total assets) + $\beta_4$Opt+ ε (13)

Assets from Acquisitions = the values of the dependent variable

CF = cash flow / lagged assets

Q = lagged Tobin's Q

ln(total assets) = the natural logarithm of total assets

Opt = managerial optimism measure

$\beta_0$ = constant

$\beta_1$, $\beta_2$, ..., $\beta_6$ = coefficients

ε = the error term

**3.6.5 Optimistic versus rational managers**

Fixed effects panel regression was used again in order to compare the behaviour of optimistic managers to the behaviour of non optimistic managers. It postulates that investment of firms with optimistic managers is more sensitive to cash flow than the investment of firms with managers who are not optimistic. When a manager voluntarily buys additional stock of their own firm, is classified as optimistic. Managers are classified as optimistic based

on the optimism "dummy" variable. The "dummy" variable is equal to 1 when members of the Executive Board and the Supervisory Board (ALL), only the Executive Board (EB), or only CEO are classified as optimistic in a given year.

For the dependent variable CAPEX/lagged assets (dependent or criterion) and the independent variables (independent or predictors) cash flow/lagged assets and lagged Tobin's Q the regression equation that arises with the use of the least square methods has the next form:

$$\text{CAPEX/lagged assets} = \beta_0 + \beta_1 \text{CF/lagged assets} + \beta_2 Q + \varepsilon \quad (14)$$

CAPEX/lagged assets = the values of the dependent variable

CF = cash flow

Q = lagged Tobin's Q

$\beta_0$ = constant

$\beta_1$, $\beta_2$, ..., $\beta_6$ = coefficients

$\varepsilon$ = the error term

## 4. RESULTS

### 4.1 Findings on managerial optimism and corporate investment

In order to examine the relationship of managerial optimism and corporate investment, the focus is on how a firm should spend its money (investment decisions) and how best a firm can obtain money to make these financing decisions. One can easily see (Table 1) that investment as expressed by capital expenditures divided by lagged assets, is positively related to cash flow and Tobin's Q, with robust p-values significant at the 1 per cent level.

Compared to the results of Glaser et al. (2008) this work finds that managerial optimism is positively and significantly related to investment for all categories of managers at the 1 per cent level. On the contrary, Glaser et al. (2008) find that managerial optimism is statistically significant only regarding CEOs. Thus, the first result is that firms with optimistic managers tend to invest more.

This work also finds that the stronger results regarding managerial optimism are found for the group of CEOs since they display the highest coefficient values of all three groups of managers. However, statistical significance in our results is found for EB managers at the 10 per cent level. Therefore, the conclusion drawn is that firms with optimistic managers indeed invest more even when other variables are controlled for.

### 4.2 Findings on managerial optimism and corporate investment: dependence on firm size

In order to separate the sample into firms according to their size the process is to simply record their total asset value. Total assets display the combined value of a firm's assets. Large firms have above median total assets value, while small firms have below median total assets value (Table 2).

As a general result of this regression one can observe that the effects of managerial optimism on corporate investment are basically driven by smaller firms. This result is consistent with Glaser et al. (2008). However, the model, especially regarding small firms shows much higher adjusted R-squared values than in Glaser et al. (2008). This shows that this work's model fits the data better. For the Executive Board (EB) members along with the managerial optimism coefficients, the R-squared values are higher too. Probably this can be explained because the Executive Board members usually make the decisions within a firm and reasonably they seem to be more optimistic than the Supervisory Board managers for example.

**Table 1**:Basic regression results of the relation between managerial optimism and corporate investment

| Dependent Variable | CAPEX/Lagged Assets | CAPEX/Lagged Assets | | | CAPEX/Lagged Assets | | | (CAPEX-Industry CAPEX)/Industry CAPEX | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Time period | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 |
| Optimism based on | | All | EB | CEO | All | EB | CEO | All | EB | CEO |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Cash flow/lagged assets | 0.030 | 0.024 | 0.024 | 0.024 | 0.012 | 0.012 | 0.018 | 0.016 | 0.018 | 0.106 |
| | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Lagged Tobin's Q | 0.032 | 0.026 | 0.026 | 0.026 | 0.015 | 0.024 | 0.012 | 0.017 | 0.021 | 0.081 |
| | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Leverage Ratio | | | | | 0.010 | 0.017 | 0.009 | 0.000 | 0.000 | -0.070 |
| | | | | | (0.003***) | (0.001***) | (0.008***) | 0.647 | 0.647 | 0.655 |
| Ln (total assets) | | | | | 0.000 | 0.000 | 0.000 | -0.060 | -0.070 | -0.004 |
| | | | | | 0.269 | 0.226 | 0.253 | 0.253 | 0.247 | 0.286 |
| Sales growth | | | | | 0.119 | 0.112 | 0.117 | 0.112 | 0.093 | 0.798 |
| | | | | | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Managerial optimism | | 0.007 | 0.007 | 0.009 | 0.004 | 0.004 | 0.007 | 0.004 | 0.003 | 0.026 |
| | | (0.000***) | (0.000***) | (0.000***) | (0.328) | (0.055*) | (0.485) | (0.078*) | (0.053*) | (0.218) |
| Constant | 0.138 | 0.013 | 0.013 | 0.015 | 0.013 | 0.015 | 0.013 | 0.540 | 0.570 | 0.740 |
| | (0.013**) | (0.000***) | (0.000***) | (0.000***) | 0.265 | 0.234 | 0.245 | (0.000***) | (0.000***) | (0.000***) |
| Year fixed effects | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Cases | 3634 | 3634 | 3634 | 3634 | 3631 | 3631 | 3628 | 3631 | 3633 | 3584 |
| Adjusted R-squared | 0.582 | 0.601 | 0.555 | 0.468 | 0.621 | 0.578 | 0.529 | 0.263 | 0.258 | 0.247 |

This table displays fixed effects panel regression results of capital expenditures on several control variables. The dependent variable is capital expenditures divided by lagged assets in regressions 1 to 7 and (capex-industry capex)/industry capex in regressions 8 to 10. In all regressions we analyse cash flow divided by lagged assets and lagged Tobin's Q as control variables. In regressions 5 to 10 we also include leverage ratio, the natural logarithm of total assets and sales growth as explanatory variables. We include our optimism "dummy" variable in regressions 2 to 10. The "dummy" variable is equal to 1 when members of the EB and SB (ALL), only the EB, or only CEOs are classified as optimistic in given year. All regressions include firm and year fixed effects. Time period is 2007-2012. All variables are winsorised at the 1 per cent level. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

**4.3 Findings on managerial optimism and corporate investment: dependence on ownership structure**

In order to categorise the sample firms the approach is to divide them into three terciles. The first consists of firms with a low degree of closely held shares, the second consists of firms with a middle degree of closely held shares, and the third consists of firms with a high degree of closely held shares. A closely held firm is a firm in which more than half of its shares are held by fewer than 5 individuals.

Consistent with Glaser et al. (2008) managerial optimism is never linked to corporate investment for firms that belong to the second tercile of middle degree of closely held shares. On the contrary, this study finds that managerial optimism mainly affects corporate investment in firms with high degree of closely held shares. This can be explained due to the limited executive members who are responsible for the decision making within these firms. The existence of optimism within such firms may obviously constitute of a great influence for the firm's corporate investment (Table 3).

**4.4 Findings on managerial optimism and acquisitions**

The first step is to examine the "assets from acquisitions" for the firms of the sample. The choice made is to test acquisitions separately as they are an aspect of corporate strategy, finance and management, having great impact on a firm's corporate investment decision making. The dependent variable is equal to 1 if the "assets from acquisitions" variable is positive in a given year and vice versa. Therefore, the acquisitions "dummy" variable is created on several control variables, like cash flow divided by lagged assets, lagged Tobin's Q and the natural logarithm of total assets.

Consistent with Boehmer and Netter (1997) the optimism variable is negatively correlated with the probability of an acquisition, and regarding the Executive Board decisions it shows up significantly. Therefore, a very interesting result can be observed. Biased managers who are optimistic do not significantly affect the probability of an acquisition although one could say that optimistic managers tend to undertake risky projects and as seen already seen they voluntarily increase the company's specific risk (Table 4).

**4.5 Optimistic versus non-optimistic managers: Findings**

The next step is to classify managers as optimistic based on the optimism "dummy" variable. Investment of firms with optimistic managers is more sensitive to cash flow compared to the investment of firms with managers who are not optimistic. The managers in the sample are separated to optimistic and not optimistic, based on the positive or negative value of the described optimism variables. Therefore, a positive value of these variables indicates an optimistic expectation of the Board members, so managers are classified as optimistic.

Moreover, for both the Executive Board and Supervisory Board members, the number of purchases is higher than the number of sales, something that advocates the fact that there are many cases in which managers increase their exposure to firm specific risk voluntarily.

Consistent with Glaser et al. (2008), Malmendier and Tate (2005a, 2005b) and Lin et al. (2005), this work indicates that the investment of firms with optimistic managers is more sensitive to cash flow than the investment of firms with managers who are not optimistic (Table 5).

**Table 2**: Relation between managerial optimism and corporate investment: dependence on firm size

| Dependent Variable | CAPEX/Lagged Assets | CAPEX/Lagged Assets | | | CAPEX/Lagged Assets | | | (CAPEX-Industry CAPEX)/Industry CAPEX | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Time period | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 | 2007-2012 |
| Optimism based on | | All | EB | CEO | All | EB | CEO | All | EB | CEO |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Cash flow/lagged assets | 0.030 | 0.024 | 0.024 | 0.024 | 0.012 | 0.012 | 0.018 | 0.016 | 0.018 | 0.106 |
| | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Lagged Tobin's Q | 0.032 | 0.026 | 0.026 | 0.026 | 0.015 | 0.024 | 0.012 | 0.017 | 0.021 | 0.081 |
| | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Leverage Ratio | | | | | 0.010 | 0.017 | 0.009 | 0.000 | 0.000 | -0.070 |
| | | | | | (0.003***) | (0.001***) | (0.008***) | 0.647 | 0.647 | 0.655 |
| Ln (total assets) | | | | | 0.000 | 0.000 | 0.000 | -0.060 | -0.070 | -0.004 |
| | | | | | 0.269 | 0.226 | 0.253 | 0.253 | 0.247 | 0.286 |
| Sales growth | | | | | 0.119 | 0.112 | 0.117 | 0.112 | 0.093 | 0.798 |
| | | | | | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Managerial optimism | | 0.007 | 0.007 | 0.009 | 0.004 | 0.004 | 0.007 | 0.004 | 0.003 | 0.026 |
| | | (0.000***) | (0.000***) | (0.000***) | (0.328) | (0.055*) | (0.485) | (0.078*) | (0.053*) | (0.218) |
| Constant | 0.138 | 0.013 | 0.013 | 0.015 | 0.013 | 0.015 | 0.013 | 0.540 | 0.570 | 0.740 |
| | (0.013**) | (0.000***) | (0.000***) | (0.000***) | 0.265 | 0.234 | 0.245 | (0.000***) | (0.000***) | (0.000***) |
| Year fixed effects | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Cases | 3634 | 3634 | 3634 | 3634 | 3631 | 3631 | 3628 | 3631 | 3633 | 3584 |
| Adjusted R-squared | 0.582 | 0.601 | 0.555 | 0.468 | 0.621 | 0.578 | 0.529 | 0.263 | 0.258 | 0.247 |

This table displays fixed effects panel regression results of capital expenditures on several control variables for large firms (regressions 1 to 6) and small firms (regressions 7 to 12). Large firms have above median total asset values and small firms have below median total asset values. The dependent variable is capital expenditures divided by lagged assets in regressions 1 to 3 and 7 to 9 and (capex-industry capex)/industry capex in regressions 4 to 6 and 10 to 12.. In all regressions we analyse cash flow divided by lagged assets and lagged Tobin's Q as control variables. Furthermore, we include our optimism "dummy" variable in all regressions. The "dummy" variable is equal to 1 when members of the EB and SB (ALL), only the EB, or only CEOs are classified as optimistic in given year. All regressions include firm and year fixed effects. Time period is 2007-2012. All variables are winsorised at the 1 per cent level. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

**Table 3**: Relation between managerial optimism and corporate investment: dependence on ownership structure

| Optimism based on | All | All | All | EB | EB | EB | CEO | CEO | CEO |
|---|---|---|---|---|---|---|---|---|---|
| Closely held shares | 1st tercile (low) | 2nd tercile (middle) | 3rd tercile (high) | 1st tercile (low) | 2nd tercile (middle) | 3rd tercile (high) | 1st tercile (low) | 2nd tercile (middle) | 3rd tercile (high) |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| Cash flow/lagged assets | 0.024 | 0.030 | 0.024 | 0.011 | 0.033 | 0.023 | -0.014 | -0.020 | 0.024 |
| | (0.000***) | 0.450 | (0.000***) | 0.131 | 0.234 | 0.118 | 0.490 | 0.490 | (0.004***) |
| Lagged Tobin's Q | 0.023 | 0.002 | 0.016 | 0.021 | 0.001 | 0.010 | -0.001 | -0.001 | 0.023 |
| | (0.002***) | (0.031**) | (0.001***) | 0.579 | 0.240 | (0.003***) | 0.358 | 0.358 | (0.002***) |
| Managerial optimism | 0.010 | 0.003 | 0.009 | 0.001 | 0.001 | 0.007 | 0.001 | 0.001 | 0.010 |
| | (0.009***) | 0.737 | (0.001***) | 0.264 | 0.806 | (0.045**) | 0.237 | 0.237 | (0.009***) |
| Constant | 0.050 | 0.058 | 0.062 | 0.002 | 0.059 | 0.073 | 0.026 | 0.026 | 0.050 |
| | (0.004***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Year fixed effects | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Cases | 108 | 101 | 95 | 108 | 101 | 95 | 108 | 101 | 95 |
| Firms | 28 | 31 | 37 | 28 | 31 | 37 | 28 | 31 | 37 |
| Adjusted R-squared | 0.114 | 0.188 | 0.201 | 0.122 | 0.144 | 0.121 | 0.144 | 0.145 | 0.185 |

This table displays fixed effects panel regression results of capital expenditures divided by lagged assets on several control variables for firms with varying degrees of closely held shares (in per cent of shares outstanding) as proxy for ownership structure. This variable represents shares held by insiders. It includes but is not restricted to shares held by officers, directors, and their immediate families, shares held in trust, shares of the company held by any other corporation, or shares held by individuals who hold 5 per cent or more of the outstanding shares. In all regressions we analyse cash flow divided by lagged assets and lagged Tobin's Q as control variables. Furthermore, we include our optimism "dummy" variable in all regressions. The "dummy" variable is equal to 1 when members of the EB and SB (ALL), only the EB, or only CEOs are classified as optimistic in given year. All regressions include firm and year fixed effects. Time period is 2007-2012. All variables are winsorised at the 1 per cent level. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

**Table 4**: Optimism and acquisitions: Basic regressions

| **Time period** | **2005-2012** | **2005-2012** | **2005-2012** | **2005-2012** |
|---|---|---|---|---|
| **Optimism based on** | **All** | **All** | **EB** | **CEO** |
| | **41** | **42** | **43** | **44** |
| Cash flow/lagged assets | 0.072 | 0.072 | 0.129 | 0.030 |
| | 0.450 | 0.449 | 0.341 | 0.820 |
| Lagged Tobin's Q | -0.132 | -0.152 | -0.059 | -0.206 |
| | 0.104 | (0.099*) | 0.606 | (0.074*) |
| Ln (total assets) | 0.210 | 0.209 | -0.217 | 0.591 |
| | 0.369 | 0.372 | 0.517 | (0.073*) |
| Managerial optimism | | -0.046 | -0.140 | 0.044 |
| | | 0.416 | (0.079*) | 0.588 |
| McFadden's adjusted pseudo-R squared | 0.481 | 0.504 | 0.511 | 0.515 |
| Year fixed effects | yes | yes | yes | yes |
| Cases | 483 | 483 | 483 | 483 |
| Firms | 76 | 76 | 76 | 76 |

This table shows fixed effects logit panel regression results of a mergers and acquisitions "dummy" variable on several control variables. The dependent variable is set equal to 1 if the "assets from acquisitions" variable is positive in a given year. In all regressions, we analyse cash flow divided by lagged assets, lagged Tobin's Q, and the natural logarithm of total assets as control variables. In regressions 2 to 4 we also include an optimism "dummy" variable. The "dummy" variable is equal to 1 when members of the EB and SB (ALL), only the EB, or only CEOs are classified as optimistic in given year. All regressions include firm and year fixed effects. Time period is 2007-2012. All variables are winsorised at the 1 per cent level. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

**Table 5**: Empirical Results: Optimistic versus non optimistic managers

| **Optimism based on** | **All** | **All** | **EB** | **EB** | **CEO** | **CEO** |
|---|---|---|---|---|---|---|
| **Group** | **Non Optimistic** | **Optimistic** | **Non Optimistic** | **Optimistic** | **Non Optimistic** | **Optimistic** |
| | **45** | **46** | **47** | **48** | **49** | **50** |
| Cash flow/Lagged Assets | 0.029 | 0.032 | 0.032 | 0.040 | 0.024 | 0.041 |
| | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.000***) |
| Lagged Tobin's Q | 0.024 | 0.031 | 0.027 | 0.032 | 0.020 | 0.033 |
| | (0.000***) | (0.000***) | (0.000***) | (0.000***) | (0.007***) | (0.000***) |
| Constant | -0.001 | -0.007 | -0.007 | -0.004 | 0.005 | -0.010 |
| | 0.840 | (0.012**) | 0.352 | 0.391 | 0.614 | (0.001***) |
| Year fixed effects | yes | yes | yes | yes | yes | yes |
| Cases | 349 | 3258 | 179 | 1604 | 170 | 1649 |
| Firms | 78 | 102 | 63 | 115 | 61 | 120 |
| Adjusted R-squared | 0.259 | 0.323 | 0.190 | 0.204 | 0.274 | 0.254 |

This table displays fixed effects panel regression results of capital expenditures on several control variables for large firms whose managers are classified as not optimistic (1, 3 and 5) and optimistic (2, 4 and 6). The dependent variable is capital expenditures divided by lagged assets. In all regressions, we analyse cash flow divided by lagged assets and lagged Tobin's Q as control variables. Managers are classified as optimistic based on an optimism "dummy" variable. The "dummy" variable is equal to 1 when members of the EB and SB (ALL), only the EB, or only CEOs are classified as optimistic in given year. All regressions include firm and year fixed effects. Time period is 2007-2012. All variables are winsorised at the 1 per cent level. Robust p-values are in parentheses. *** indicates significance at 1 per cent, ** indicates significance at 5 per cent and * indicates significance at 10 per cent.

**5. Conclusions and Further Research**

The basic instrument that was used was to link balance sheet and stock market data of Greek firms listed in the ASE to directors' dealings data, that is the buying and selling of stock from managers of their own firms on their personal accounts. Directors' dealings data were used in order to construct the optimism measures. The sample of firms consisted of 184 non-financial firms listed in the ASE. Financial firms were excluded due to the existence of differences in compiling their annual reports and financial statements. Eventually, this work produced some very important results.

Consistent with the relative literature (Malmendier and Tate, 2005a, 2005b; Martin, 2008; Glaser *et al.*, 2008; Michel, 2009) it has been found that managers are optimistic. They, consequently, voluntarily increase their firm's exposure to company specific risk. The number of transactions that were recorded as purchases were much greater than sells even though the volume of sells exceeded by far the volume of purchases. However, the tendency of managers was measured based on the volume of purchases and sales. Firms with optimistic managers invest more when compared with the degree of investment of non-optimistic managers.

The effects of managerial optimism on corporate investment are basically driven by smaller firms something that is consistent with the results of Glaser et al., 2008. In smaller firms such phenomena are more pronounced. The existence of managerial optimism is more intense since managers are less and as a result the impact of their decision making is stronger in these firms. Results are also stronger regarding the members of the Executive Board (EB) of smaller firms.

Ownership structure is an important aspect of corporate governance since it specifies the incentives of managers and consequently affects their firms' performance. In order to examine the impact of managerial optimism on corporate investment with dependence on ownership structure of firms, closely held shares was used as a proxy in order to rank firms according to their degree of closely held shares. Therefore, it was found that managerial optimism mainly affects corporate investment in firms with high degree of closely held shares. Moreover, managerial optimism is never linked to corporate investment regarding firms which belong to middle degree of closely held shares. According to Morck, Shleifer and Vishny (1988) and Glaser et al. (2008) a similar non-monotonic relationship between management ownership and market valuation of a firm is recorder, as measured by Tobin's Q in both studies.

Acquisitions are an aspect of corporate investment decision strategy. Dealing with profitable acquisitions can boost a firm to grow rapidly, improve its future performance, increase its profits, reduce financial risk and eventually have a larger market share. However, if an acquisition does not work, the fallout can be disastrous for a firm. Again, managers have to make these decisions either to decide to complete an acquisition or not. Yet, biased managers who are optimistic it is found that they do not significantly affect the probability of an acquisition although one could say that optimistic managers usually undertake risky projects and definitely acquisitions involve risk. Obviously, decisions for acquisitions are not affected by the manager's optimism regarding the prospects of his firm. This result it is not consistent with results of previous literature like Malmendier and Tate (2008) and Glaser et al. (2008) who have been found that cash flow, Tobin's Q and firm size mainly drive the probability of an acquisition. Probably the low number of observations constituted of an obstacle in order to explore the impact of managerial optimism on mergers and acquisitions decision making in greater detail.

Therefore, it is confirmed that investment of firms with optimistic managers was found to be more sensitive to cash flow than the investment of firms with managers who are

not optimistic. Optimism was proved to be extremely effective regarding investment. Cash flow as a significant predictor of investment served as an indicator of a firm's financial health and when a firm could generate positive cash flow, its long-term success could be regarded as granted. The sensitivity of cash flow to investment was greater for firms with optimistic managers due to the fact that optimistic managers can influence cash flow at a greater level because of their engagement in more risky projects than managers who are not optimistic.

A possible proposal for further research could be the testing of each year separately. In this work we have run the regressions for the whole of the 6-year period of 2007 to 2012. However, testing each year individually could provide researchers with the ability to compare different results, to find out whether there was anything special statistically for each specific year and maybe test the period after the year 2010 when the Greek crisis had started to come up on the horizon. The impact of the Greek financial crisis on managerial behaviour and on the personal characteristics of managers like optimism could constitute a field for further research.

During the empirical research, Greek financial firms were excluded from the sample due to differences in the compilation of their balance sheets and annual reports. However, this limitation can serve as a suggestion for further research in order to construct a sample consisting of only financial firms. It would be very intriguing the fact that in the current economic conditions in Greece, which is being whipped by large deficits, fiscal inefficiencies as well as great unemployment and depression conditions, to examine managerial optimism and its impact on corporate investment regarding financial firms and more specifically financial institutions at this period of time when the recapitalisation of Greece's banks has to be completed without any delays.

Another field of supplementary research would be the impact of managerial optimism on not only corporate investment, but on other financial and non-financial decisions such as risk management, investments in R&D, advertising and intangible assets. In other words the suggestion would be to examine the impact of managerial optimism on the whole range of decisions that managers have to make. Furthermore, other measures of investment profitability should also be taken into consideration. Additionally, it would be very interesting not to focus only on optimism, but on other cognitive biases too. Conservatism, the "curse" of knowledge, the empathy gap, the illusion of control, loss aversion and zero-risk bias are only some of the cognitive biases which could be proposed for further research.

It became clear during this research that the existence of optimism as a psychological and personal characteristic of Greek managers is met in every single step of their decision making process especially regarding the corporate investment decision making policies. However, the frequent and excessive use of optimism as a phenomenon of overinvestment usually has led to unfavourable outcomes for both managers and firms. It has been found that it is difficult to control this psychological bias since it is often connected to the managerial belief that personal psychological characteristics could only lead to greater outcomes for their firm.

Especially regarding Greece it should be highlighted that Greek managers are extremely overconfident and overoptimistic, something that has constituted as one of the reasons that have caused the Greek economic crisis to rise up mainly regarding the years after 2010 when economic depression has become more noticeable. To conclude, it is easily understood that the field of behavioural finance that was explored with the link of corporate investment to managerial optimism, is only a very small part of the overall possible research. There are many unexplored areas available for

further research. It is finally very important to examine more deeply how the investment decision process works within a firm. Is there a difference between upper and lower level managers in decision making? Is corporate culture significant enough to be affected by managerial cognitive biases? Can managers be non-biased? Well, future research is absolutely necessary in order to investigate cognitive biases and consequently their effects on corporate decisions.

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