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MANAGERIAL BEHAVIOR AND CAPITAL STRUCTURE DECISIONS; DO OVERCONFIDENCE, OPTIMISM AND RISK AVERSION MATTER?

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ABSTRACT

This study aims at examining the importance of managers' behavior in explaining the capital structure related decisions of the listed firms in the Egyptian stock exchange (EGX). Managers' behavior data has been collected using a survey method (i.e. psychometric test) which specifies three aspects of the behavior (namely: overconfidence, optimism, and risk aversion) in addition to some demographic characteristics as suggested by previous studies particularly Graham *et al.* (2013) and Menkhoff *et al.* (2006). The sample of the study includes 47 mangers and 31 firms along with their related financial information which has been extracted from the published financial statements for a period of 3 consecutive years. The secondary data of the Egyptian firms and the responses from survey were fully analyzed. A cross sectional analysis is applied to assess the effect of the managers' behavior on the corporate financial leverage level. Further, a hierarchal type of regression is used due to the existence of some control variables. The findings of the study reveal that managerial optimism and risk tolerance have a significant positive impact on the firm's leverage ratio, while managerial overconfidence has no significant impact on the firm's capital structure. Moreover, risk averse managers differ from non-risk averse managers in terms of the adopted leverage level of their firms, as risk averse managers tend to use lower leverage ratio level.

Contribution/ Originality: Although there is a surge of empirical research in behavioral finance examined the capital structure decisions and managerial behavior, to the best of the authors' knowledge this research effort is the first of its kind which examines this relationship in the Middle East and particularly in Egypt. Hence, this study contributes in the existing literature of behavioral finance.

1. INTRODUCTION

Capital structure efficiency and its ability to absorb the changes in the surrounding environment affect the firm's ability to perform well. Further, Strebulaev (2007) argues that firms with different leverage ratio (debt ratio) react differently to the changes in the external market. Therefore; the firm capital structure contributes to the firm survival as the probability of survival for a firm with capital structure approaches the optimal level is higher than the firm with capital structure which is far from the optimal level (Chung *et al.*, 2013).

In the neoclassical finance paradigm, it was seen that managers are rational while undertaking the corporate related decisions as investment, financing, merger and acquisitions since it is assumed that the managers have full ability to maximize the shareholder wealth and their own utility and to incorporate all the information in forecasting. These decisions which are generated from a series of cognitive and mental processes are supposed to be unbiased and without any imperfections as managers have full knowledge and ability to update their information and beliefs. Contrary in the behavioral finance paradigm and psychological studies, it is argued that managers' ability to achieve the firm's financial objectives is based on their emotional and cognitive ability. Moreover, psychological studies stated that the decisions making process is subject to cognitive biases and bounded rationality that lead decisions to deviate from the proposed optimal models introduced by the neoclassical finance. Formlet (2001) points out that managers are not "homo-economics" i.e. they do not have complete information since they overestimate their own information and ignore the public information available for all market agents.

Furthermore, practitioners need models that combine the quantitative data of the neoclassical model and the qualitative data as the agent knowledge, skills, personality traits and characteristics that may enable them reach the real world predictions of the future outcomes. A growing strand of researches introduced plethora of evidences on the effect of the manager beliefs, traits, preferences, and other observable characteristics on the corporate decisions. The variations among firms in financing decisions, investment, merger and acquisition and the compensation contracts can be attributed to divergences in managers' behavior whether across firms or across years for each firm.

Theoretical studies such as Heaton (2002); Hackbarth (2008;2009) and Malmendier and Tate (2005) covered the relationship between the managerial behavior (i.e. optimism, overconfidence, risk propensity) and financing decisions and argued that the heterogeneity among the firms' financing policy can be attributed to the heterogeneity in the managers' behavior and personality. Consistently the empirical evidence found what supports the evidence provided by the theoretical studies. Hence, it is concluded that managers' behavior and characteristics matter to the corporate performance and decisions. Some researches argued that managers' behavior and personality traits such as overconfidence or optimism can distort the investment decisions and capital allocation process (Malmendier and Tate, 2005; Faccio *et al*., 2012) or it can lead to better level of performance (Kaplan *et al*., 2012).

Managerial psychological biases has been considered by Shefrin (2001) as a behavioral costs that harden value maximization due to the interference of these biases in the decision making process. Therefore, this study tries to examine empirically the impact of psychological aspects in managers' behavior on the Egyptian firms' capital structure choices. We argue that firms may need biased manager according to the era the firms operate in when the rational manager may not take appropriate decisions in a specific situation. For example if the firms approached financial distress it would be appropriate to have a risk averse manager that overestimate risks associated with financing sources.

This paper is structured as follows: Section 2 presents literature review; Section 3 describes the research methodology; Section 4 explains the empirical analysis and test results; Section 5 provides summary and concluding remarks.

2. THEORITICAL FRAMEWORK AND LITERATURE REVIEW

There are very few researches that link managers' behavior with the capital structure choices compared to most of the behavioral researches in finance that are related to investor behavior and asset pricing (Abdeldayem, 2015;2016). Most of the previous models and theories of the capital structure assume implicitly the rationality of the financial practitioners and the financial market but they are subject to cognitive limitations and psychological boundaries that result in behavioral biases as: conservatism, confirmation, emotional biases, means of representation and reasoning analog bias (Ali and Anis, 2012). Modern financial theories have some shortage in the prediction of the corporate decision including the capital structure policies and why the manager takes certain decisions

regarding debt/equity mix (Eldamiaty and Azim, 2008). Also the traditional corporate finance neglects the manager characteristics and instead, it focuses on the firm's characteristics (Abdeldayem, 2015).

Ever since the comprehensive study of Tversky and Kahneman (1974) that provided an alternative theory called prospect theory the researchers have been started to launch the behavioral and psychological aspects of the financial practitioners and examine the related influence of these biases on investment and financing decisions. This study is considered the starting point of the behavioral corporate finance that refutes the rationality assumption of neoclassical approach of finance Vasilion and Daskalakis (2009) and De Bondt (2008). Further, Vasilion and Daskalakis (2009) argue that neoclassical approach of finance is threatened by the emergence of qualitative methodology researches that assess and analyze the financial behavior (e.g. post-Keynesian approach). Hence, the impact of psychological issues on the financing decision is not well documented as their influence on the investment studies. Hence, there is a growing trend in researches addressing the managers' behavioral and personal characteristics impact on the corporate polices (Ben-David *et al.*, 2007). Moreover, these studies are conducted rarely in the Middle East and especially in Egypt.

The reasons behind studying managers' behavior and personal characteristics are the managers vital role in taking the decisions related to the corporate polices and the unexplained deviations found from the traditional assumptions (Graham *et al.*, 2013). In addition, the role of the manager is salient in predicting the future outcomes of the firms as investments returns and costs, market demand and supply that help in formulating the firm policies (Ben David *et al.*, 2010).

The most behavioral biases examined in the previous literature include optimism, overconfidence, anchoring and loss aversion. Optimism is defined as expecting and overestimating the stability of cash flow and future profitability and it is related to the manager degree of the risk tolerance (Ali and Anis, 2012; Graham *et al.*, 2013). Overconfidence refers to underestimating the volatility of the future cash flow and overestimating the private experience (Ben-David *et al.*, 2007; Ali and Anis, 2012).

Moreover, Bertrand and Schoar (2003) reveal that the existence of managers fixed effect contributes in the variation in the corporate financial decisions. This is based on developing matched manager-firm panel data to define the systematic behavior differences across the managers. They assessed the managerial fixed effect by collecting information about CEOs, COOs, CFOs of the largest 800 US firms and tracking them by restricting data collection to those CEOs that each one can be observed in at least 2 firms. They found a significant relationship between the variation across the managers and corporate performance and policies (financing, investing, organizational strategy).

Borgia and Newman (2012) tried to add in this area by examining the relationship between the manager psychology and capital structure of small and medium sized enterprises (SMEs) in china. They studied the impact of managerial external control aversion and other manager personal characteristics as (education, previous experience and managerial networks). They developed the study using both qualitative approach and quantitative approach. They argue that the impact of the managerial attitude and characteristics on financing decisions in SMEs more evident than in the large corporations.

Cronqvist *et al.* (2012) use consistency theory to match between the manager personal leverage and firm leverage. They used most recent primary home purchases as a proxy of the manager leverage and correlate the manager personal leverage with the firm leverage. The control variables of this study comprise market to book ratio, firm size, profitability, tangibility, industry leverage and other control variables of the manager personal leverage. They concluded that there is no consensus among the previous studies on the relationship between managers' characteristics as (age, education) and firms' capital structure. They reported mixed results such as older CEOs are debt averse and others prone to debt financing.

Kaplan *et al.* (2012) examine the effect of the manager ability on the corporate decisions. They collected information from an organization that have details about the interviews made to 316 CEOs candidates from 224

firms especially firms involved in buyout and venture capital transaction. They examined the candidates' ability, interpersonal skills, execution and communication skills. The data is derived from year 2000 to 2006, whilst (Bhagat *et al.*, 2011) measured manager ability by collecting information about five dimensions of manager ability including CEO cash compensation, CEO cash compensation/total assets, industry performance, CEO tenure, tenure/age. Furthermore, they controlled the firm value, tangibility, growth opportunities, profitability, total assets, past three years stock returns. They found a negative relationship between long term debt and the following: manager ability, inside equity and firm long term risk. Moreover, they observed a positive relationship between long term debt and short term risk.

Kayhan (2008) tried to link between the manager discretion and capital structure by using the corporate governance mechanisms as a proxy of the manager ability and discretion. The proxy includes: CEO duality, Board composition, Board size, manager ownership. The sample comprised 5835 firms during the period from 1998 to 2005. Kayhan found what supports the aforementioned studies by Kaplan *et al.* (2012) and Bhagat *et al.* (2011) which the managers with high discretion prone to use less debt, and prefer equity to debt. Further, Kayhan suggested that debt ratio increases are sensitive to the firm financial deficit more than the managerial discretion so it can be deduced that managerial discretion is not always a key factor of the firms' capital structure under this study.

Antonczyk and Salozmann (2014) found the individualism as a proxy of manager overconfidence across the firms in 42 countries (23518 firms). Individualism has a significant impact on the variation among these firms' capital structure. They built their analysis using leverage as a proxy of capital structure and splitting it to book value ratio and market value ratio based on the notion that capital structure theories are based on the market value. They stated that overconfidence may cause upward bias. They controlled the effect of firm size, growth, tangibility, profitability, depreciation, stock performance, and industry classification and other institutional environment of a country as inflation rate and GDP.

Overall, authors differ in measuring overconfidence and this issue is still controversial and need further research. Park and Kim (2009) summarized the various managerial overconfidence proxies used by previous researches as: manager stock options, outside perception, upward biased earnings forecast, frequency of merger and acquisition, CEO compensation, dividends payout ratio, and survey based approach.

Optimism can be defined as the overestimation of good event occurrence and undermining the probability of bad events. Antonczyk and Salozmann (2014) studied the difference between the firms' leverage across the countries by considering the individualism behavior of the countries. They found that the managers that are belonging to individualistic country tend to rely heavily on the debt financing. They consider individualism as a proxy of the managerial optimism.

Graham *et al.* (2013) used a sample of 1017 CEOs and 549 CFOs work for firms headquartered in USA. The measurement of the managerial biases was performed using questionnaire (psychometric test), they used control variables related to managers' characteristics as (age, gender, prestigious college, MBA, past experience, height) and other variables related to firm characteristics as (operating segment, firm size, public/private firms, expected growth and historical growth). Graham *et al.* (2013) findings support (Ali and Anis, 2012) as both of the studies reached that there is a positive relationship between optimism and the manager preference of internal financing then debt. In addition there is an inverse relationship between optimism and increasing the capital.

Previous studies differ in measuring managerial risk aversion as measuring risk preference differs by the domain as argued by psychological literature; therefore each research tried to measure risk preference differently. For instance, Graham *et al.* (2013) developed two scenarios presented in form of questions to gauge the managerial risk preference and accordingly decide whether the manager is risk averse or risk taker. They used univariate correlation analysis to find the degree of association between capital structure and manager characteristics (risk aversion). The measurement of the capital structure is the book leverage (total debt/total assets). Ordinary least square regression analysis is used to examine the impact of the manager behavior on the debt ratio and debt

maturity and to show to what extent managers' characteristics are contributing to the change in the capital structure using control variable from the manager side (i.e. career path and characteristics). The data is collected from 1017 CEOs and 549 CFOs work for firms headquartered in USA. The results reveal that 9.8% of the US CEOs show low risk tolerance which means that risk tolerance is dominant risk attitude among the US CEOs.

The previous researches' findings advocate the notion that managers tend to be biased in their judgment which affects their decisions. It is concluded that the manager risk attitude, personality traits and behavioral characteristics have a significant impact on the financial decision. This fact has motivated many researchers in different countries context examine such impact. These findings can help us in adding the managers' behavioral and personal characteristics as one of the most influential factor on the capital structure especially that most of the researches are conducted in USA and Asia and very few studies have been conducted in the emerging economies and particularly in the Middle East (Abdeldayem and Saad, 2018).

Accordingly, we argue that the optimistic managers tend to use internal financial resources in the first resort. If the resources are not sufficient, optimistic manager would use less risky debt then the risky debt and the final choice is equity issuance as a last resort. This means that optimistic manager reveals the pecking order theory preferences whether it is intended or not. Furthermore optimistic managers overestimate the firm profitability whereas overconfident managers underestimate the volatility of the firm earnings so they tend to use debt more than equity. Risk averse managers overestimate the associated risk with the project and try to reduce the risk by avoiding debt financing. This study is conducted adopting the assumptions of Gervais *et al.* (2011) that include:

- Complete contracting
- Manager is highly skilled and has a good access to the private high quality information.
- Deal with the manager behavior keeping aside the effect of incorporating the moral hazard effect on the capital structure choices.

3. METHODOLOGY

The research methodology includes the data used, sources of data, and techniques of analysis. Based on the availability of data, this research builds the analysis on a combination of primary data and secondary data. Primary data has been collected using a questionnaire survey which was distributed to a simple random sample of 47 managers among the Egyptian listed firms. As for secondary data, we used the published financial statements of 31 firms that are listed in the EGX in order to match between the questionnaire outcomes of the managers 'behavior & personality, and the firms' related characteristics. Hence, the research applies a cross sectional hierarchal regression to control both the effect of some managerial -related characteristics (such as age, gender, position, educational level and work experience) and the effect of some firm- related characteristics (such as firm size, profitability, tangibility, M to B ratio, firm type and industry classification) on the firm financial choices of its capital structure.

The managers of the Egyptian firms include the following positions CEOs, financial managers, board director and general director of the Egyptian listed firms in the EGX. The managers selected for the analysis are those who serve the company in the same position (tenure for job) for at least 3 years as suggested by Graham *et al.* (2013) in order to ensure the influence of the managers' decisions on the company policies as well as the managers' behavior and personality influence on the firms' performance.

3.1. Population and Sampling

The study population is defined as all the listed firms in the Egyptian stock exchange (EGX) excluding the financial firms (banks and non-banks institutions) during at least the period from 2011 to 2013. The research sample is a simple random sample of the listed firms since it is limited to the firms located in great Cairo due to time and place constraints. Therefore, the total number of firms included in this research effort is 31 firms. This research

follows the previous studies in targeting the listed firms because listed firms in the EGX represent most of the firms in Egypt.

3.2. Theoretical Model

Theoretical speculation can be a rich source of generating ideas for researchers in seeking original ways of looking at problems that otherwise might seem old. Researchers, therefore, must become experts in treating theoretical concepts, at times taken from texts whose authors might have paid little attention or care to defining the empirical referents of their ideas (Abdeldayem and Saeed, 2018). Therefore, based on previous empirical studies in this area such as Graham *et al.* (2013); Malmendier *et al.* (2011) and Antonczyk and Salozmann (2014) a theoretical model has been developed which aims to summarize the main variables that will be examined in this study. Figure (1) presents the theoretical framework/model for the study. It includes the independent variables i.e. managers' behavior (as measured by overconfidence, optimism and risk aversion) along with two sets of control variables (manager-related variables and firm-related variables) to examine their potential influence on the dependent variable of the study i.e. the capital structure decisions (as measured by firms' financial leverage ratio)

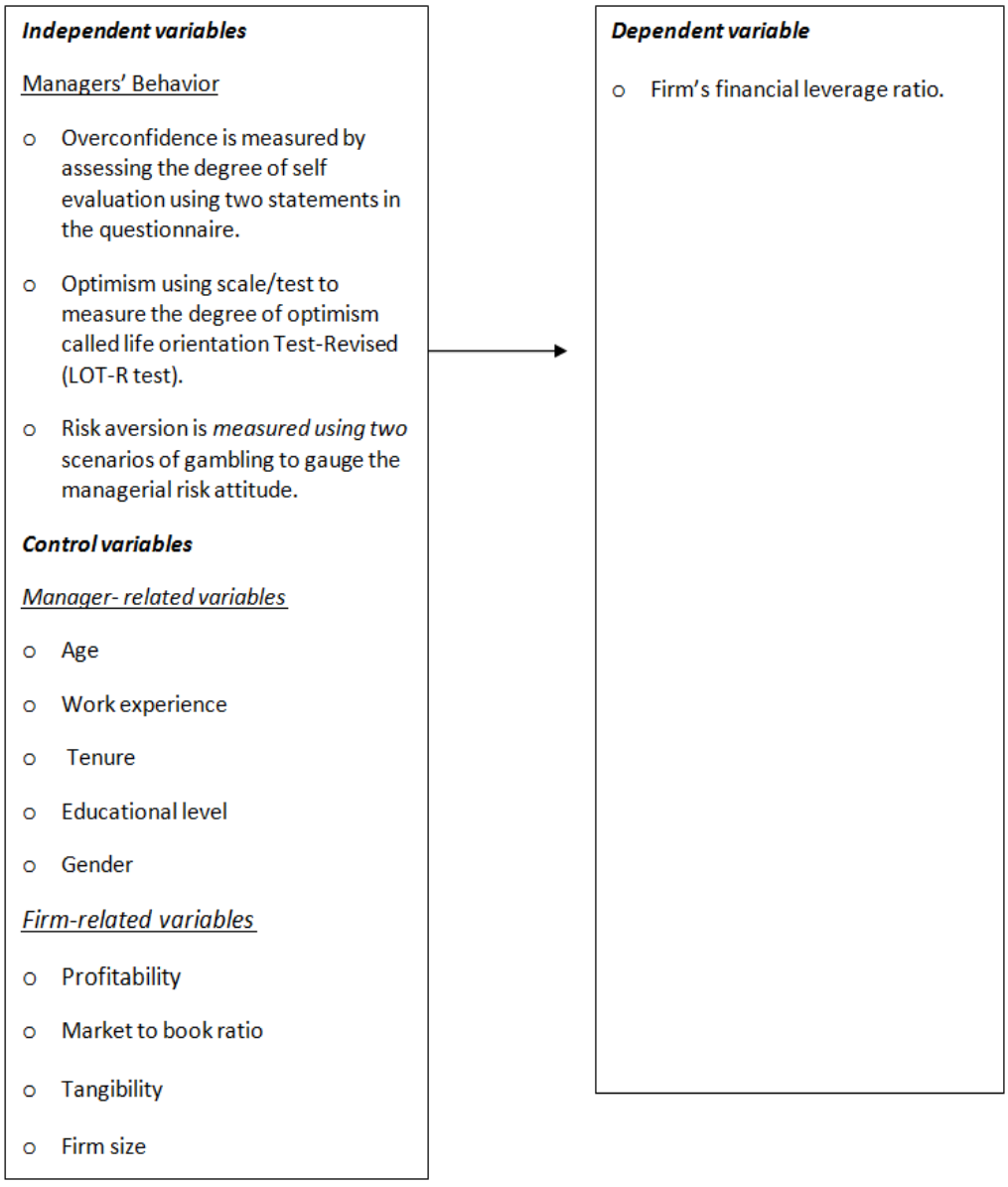

Figure-1. Theoretical Model

3.3. Research Question

Accordingly, the main research question of this study is "*"what is the effect of the managerial behavior on the corporate financial leverage in Egypt?"*

From this main question, three questions have been derived:

1- What is the effect of the managerial overconfidence on the corporate leverage?
2- What is the effect of the managerial optimism on the corporate leverage?
3- What is the effect of the managerial risk preference on the corporate leverage?

3.3. Variable Specification and Measurement

The study used two sets of variables. First the psychological aspect of managers and the second set is the field data of the Egyptian firms in a way that tries to correlate both of them.

3.3.1. Dependent Variable

Capital structure measures are different (i.e. income gearing, financial leverage, short term debt (repayable within one year/equity + total debt) (Omran and Pointon, 2009). leverage ratio is considered as a good proxy in explaining the firms' capital structure, since different leverage measures have been used (such as book leverage, long-term debt, short-term debt) in order to examine in depth this relation and get consistent results (Barros and Silveira, 2007). Leverage is considered as a key issue and important method in determining the capital adequacy and controls the business risk (Jarrow, 2013). Table (1) presents the different measures of leverage that have been used by previous studies such as Graham *et al.* (2013); Frank and Goyal (2007) and Barros and Silveira (2007).

Table-1. Leverage Measurements

Variable	Measurement
Long-term debt ratio	Total long term debt/total debt
Short-term debt ratio	Short term debt/total debt
Book leverage ratio	Total debt /book value of assets

Source: Graham *et al.* (2013)

3.3.2. Independent Variable (Managerial Behavior Aspects)

We have adopted the psychometric test in order to measure the managers' judgment biases (overconfidence and optimism) , preferences (risk aversion) and quantifying the managers attitude following the studies of Graham *et al.* (2013) and Menkhoff *et al.* (2006).

Optimism

This research uses a scale/test to measure the degree of optimism called life orientation Test-Revised (LOT-R test) as used in the study of Graham *et al.* (2013). This scale/test is widely used in the psychology tests and contains statements to be answered by the manager in order to gauge the managerial optimism.

Risk Attitude and Preference

This study tries to examine the managers' behavior towards risky choices to assess the degree of risk aversion by asking the managers certain questions. This research follows Graham *et al.* (2013) who gauged the managerial risk preference through introducing two personal scenarios which managers are going to answer according to the available information.

Over Confidence

This research follows Menkhoff *et al.* (2006) in measuring the managerial overconfidence that based on the managers' experience with two aspects self-evaluation that presented by two items: own performance item" how do

you evaluate your own performance compared to other managers?" and news not surprising item" the majority of economic news is not surprising for me."

3.3. Control Variables

In this research effort, we have utilized two sets of control variables. The first set is related to managers' characteristics that might have an impact on the financial decisions and the second set is related to firms' characteristics that may have an impact on the leverage ratio.

Managerial –Related Variables

It is found that manager age, education, gender, managerial network, tenure (years of experience), past experience and college have an impact on the leverage ratio

Firm-Related Variables

Our research follows Park and Kim (2009); Borgia and Newman (2012); Graham *et al.* (2013); Malmendier *et al.* (2011) in inserting the common determinants of capital structure as control variables that have influence on the firms' leverage. Table (2) below summarizes the control variable of this research effort:

Table-2. Control Variables Measurement

Variables	Measurements
Firm profitability	Total earnings before interest, tax and depreciation / total assets or operating income based profitability
Firm size	log (total assets)
Tangibility or collateral	Propertry, plants, and equipment /total assets
Market to book ratio as a proxy of growth or investment opportunity	(market value of equity+book value of total debt)/book value of total assets

Source: Park and Kim (2009); Borgia and Newman (2012); Graham *et al.* (2013)

3.4. Regression Equation Specifications

The research examines the empirical relationship between managerial behavior and corporate leverage using different set of data and following Park and Kim (2009). Moreover, the previous discussion of the research variables including (dependent, independent and control variables) would help in formulating the regression model on the basis of the literature review. Therefore, the proposed regression model is:

Leverage = β0 + B1 optimism + β2 overconfidence + β3 risk aversion + β4 manager age + β5 manager gender + β6 graduation degree + β7 firm type + β8 tenure by firm + B9 tenure by position + β10 work experience + β11 profitability + β12 tangibility + β13 M TO B + β14 log size + β15 autonomy + β16 non-autonomy + β17 construction + β18 other industry classification + β19 retailing + β20 risk tolerance + ε (1)

4. ANALYSIS AND EMPIRICAL FINDINGS

We are presenting the empirical analysis in order to achieve the main objective of the study, which is examining the relationship between managers' behavior and corporate financial leverage in the Egyptian context. First, we introduce descriptive statistics to define the characteristics of the sample, and then apply the correlation and regression analysis to examine this relationship.. Finally, T-test is used to conduct hypotheses testing.

4.1. Descriptive Statistics

As mentioned earlier, this research is targeting the top management of the Egyptian listed firms including financial managers, CEOs and their deputies, general managers and board directors who have at least three years tenure in the same position to ensure a reasonable response rate and to make sure of the effect of the managers'

behavior on the corporate decisions. Following Graham *et al.* (2013) and taking into consideration the decision making sharing by controlling the managers decision making ability whether they depend totally on others, share with others equally, or take the decision independently.

All the information related to the managers' behavioral and personal characteristics is collected using a questionnaire survey. Further, the firm related information such as firm size, leverage , tangibility, market to book ratio and profitability have been calculated from the information disseminated in the published financial statement (balance sheet, income statement and cash flow statement) along with the available reports from the EGX about the firms' closing prices at the end of three consecutive years.

Most of the research respondents are financial managers category who are typically responsible for the firm's financial decisions including the sources of finance and comprise 47.8% of the respondents. CEOs and their deputies are the next most respondents of the research questionnaire that represent 21.7% of the respondents. Both board directors and general managers are representing 30.4% of the total respondents. Surprisingly about 80.4% of the managers stopped their educational level at bachelor degree and only 6.5% have got the MBA degree. However, top management positions should be fulfilled by managers with a higher educational level than bachelor degree, as this may indicate a good level of knowledge in the business fields which can enhance the decision making process.

Further, 41% of the managers have working experience in accounting before their current positions and 21.8% of the respondents have working experience in marketing/sales and operations management, while only 4.3% have a working experience in finance. The average age of managers is 49 years old, average tenure years in the current position is 8 years and the average number of years the managers work for their firms is 24years. Risk averse managers represent 29.8% of the sample while the remaining are risk tolerant 21.3% and risk indifferent managers 29.8%. Also, optimistic managers represent 48.8% of the respondents while non-optimistic managers represent only 42.6%. In addition, 57.4% of the respondents are overconfident and 38.3% of the managers are non-overconfident managers. This result supports the psychological researches that found the professional overconfidence is more evident than the normal individual overconfidence.

It can be seen from table (3) below, that the total number of respondents differs from one variable to another since some respondents left some questions blank without answers. Hence, the total valid complete cases are 32 cases. Table (3) provides information about the minimum, maximum, mean and the degree of normality of the continuous variables.

Table-3. Descriptive Statistics of the research Continuous Variables

	N	Minimum	Maximum	Mean	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
short term debt ratio	46	.02100	1.00000	.6640870	-.692	.350	-.948	.688
long term debt ratio	46	.00000	.90200	.2713526	.885	.350	-.548	.688
firm total financial leverage ratio	46	.02100	1.33000	.5650630	.657	.350	-.158	.688
tangibility	46	.00020	.84300	.3373870	.611	.350	-.940	.688
log size	46	6.940	10.710	8.54152	-.119	.350	.067	.688
profitability	46	-.074	.326	.06184	1.045	.350	1.747	.688
manager age by years	33	36	57	49.67	-.845	.409	.230	.798
tenure at the firm	38	5	37	24.32	-.681	.383	-.113	.750
tenure as CEO/CFO	40	3	25	8.55	1.554	.374	4.293	.733

Table (3) shows that the Egyptian firms rely more on debt than equity as the mean value of the total debt = 0.56. Egyptian listed firms depend more on short term debt than long term debt since the mean of short term debt

(0.66) is higher than the mean of long term debt (0.27). This result is supporting (Eldamiaty and Azim, 2008) findings that the Egyptian firms rely mainly on short term debt. Short term debt and long term debt of this sample are highly skewed than the total firm leverage even after the transformation process to amend the normality. Therefore this research effort is based on the firm total leverage only to test the relationship between managers' behavior and firm's capital structure or financial leverage.

Fixed assets represent on average 33% of the Egyptian firms total assets. The firms' average profitability is relatively low (0.061) because there is a number of firms achieved losses and these losses are accumulated across years.

Firm's total leverage normality test is relatively better than short term debt and long term debt as skewness value for the total leverage (0.657) is less than the others' values (0.692),(0.885) respectively. Moreover kurtosis value of total leverage (0.158) is less than that of short term value (0.548) and long term value (0.948).

4.2. Assessing the Reliability

We present the results of the reliability test to assess the degree of internal consistency among the items of optimism and overconfidence scale since these scales were used in different context from the Egyptian one. Table (4) summarizes the results of the reliability test of the questionnaire. 6 items are included in the questionnaire in order to assess the managerial optimism along with 2 items to assess the managerial overconfidence:

Table-4. Reliability Statistics of the questionnaire

Cronbach's Alpha	No. of Items
0.510	8

As shown in table (4), Cronbach's alpha coefficient of 0.510 is relatively good due to the low number of items included in the scale (8 items only) (see (Scheier *et al.*, 1994; Graham *et al.*, 2013)).

4.3. Assessing the Relationship between Managers' Behavior and Firms' Leverage

Normality and Outlier Assessment

Before conducting correlation and regression analysis, few assumptions must be tested to ensure the validity of the results of the correlation and regression. First, we tested the outliers' effect. Table (5) reveals the mean and variance of the dependent variable (firm's total financial leverage). In addition, this test helps in assessing the degree of normality of the dependent variable:

Table-4. Descriptive to assess the outlier effect

			Statistic	Std. Error
Total firm's financial leverage ratio	Mean		.5650630	.05242777
	95% Confidence Interval for Mean	**Lower Bound**	.4594681	
		Upper Bound	.6706580	
	5% Trimmed Mean		.5527923	

The 5% trimmed mean value of the total leverage ratio is (0.57). It is not very different from the mean value of (0.55) which means that the outliers have a limited effect on the total leverage mean. Therefore, there is no outliers' problem. Total firm's financial leverage variable has skewness and kurtosis problem which both measures are away from zero level so the normality of the data is not matched. This problem can be attributed to the small sample size. Consequently; it can be improved in order to approach zero level for both kurtosis and skewness by enlarging the sample size.

Further the test of normality is displayed in table (6). It can be seen that Kolmogrov-Smirnov significance level of the total financial leverage is relatively not significant so the dependent variable is normally distributed. The

histogram graph shows a relatively positive skewness in the normal curve (refer to figure 2). Therefore, it is accepted to take the square root of the total firm's leverage and examine the improvement in the normality curve.

Table-5. Tests of Normality of total financial leverage

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
firm total financial leverage ratio	0.111	46	0.198	0.937	46	.015

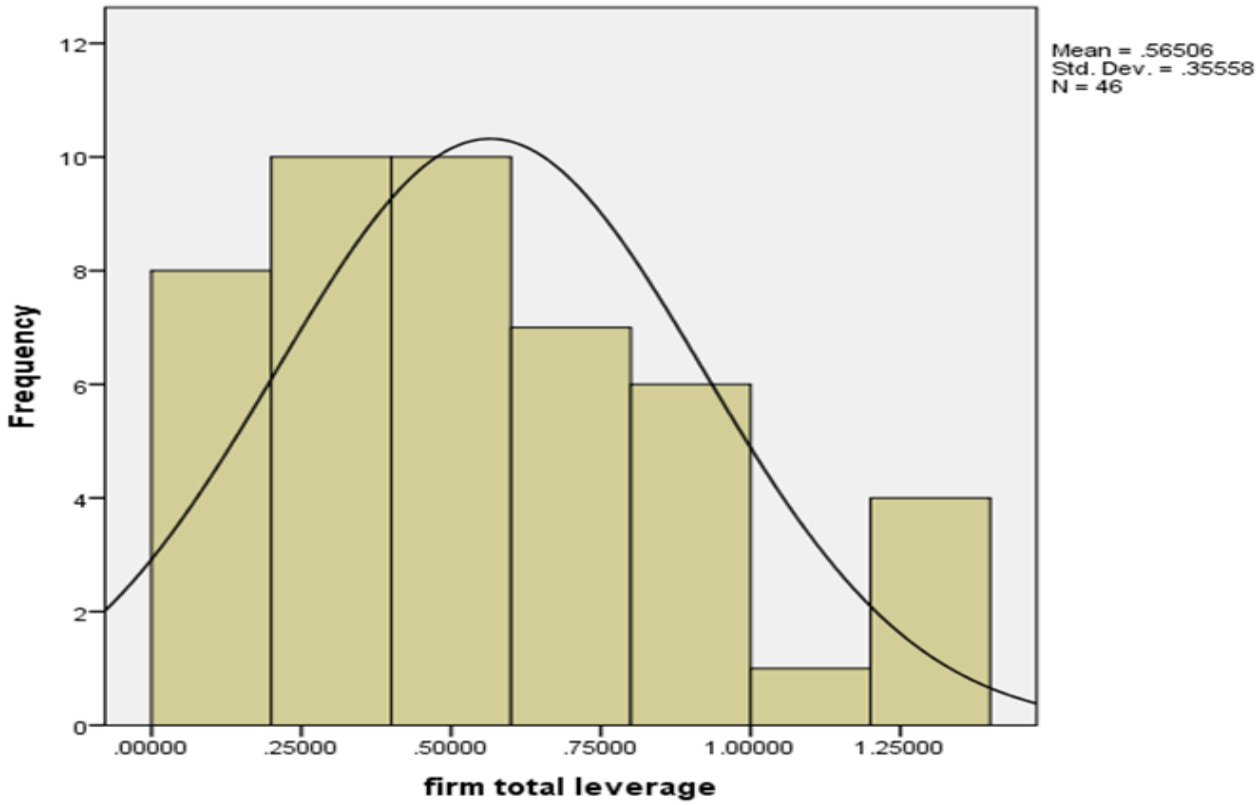

Figure-2. Firm's Total Financial Leverage Histogram

Figure (2) shows that the histogram normality curve is relatively positive skewed which means that most of the data is less than the mean point. Hence, we conducted a transformation to the total leverage into new variable by taking the square root of the original data of the total leverage (sqrttotal) to improve the normality curve. The transformation process improved the normality curve of the dependent variable as shown the figure (3) below; therefore, that meets the assumption of normality.

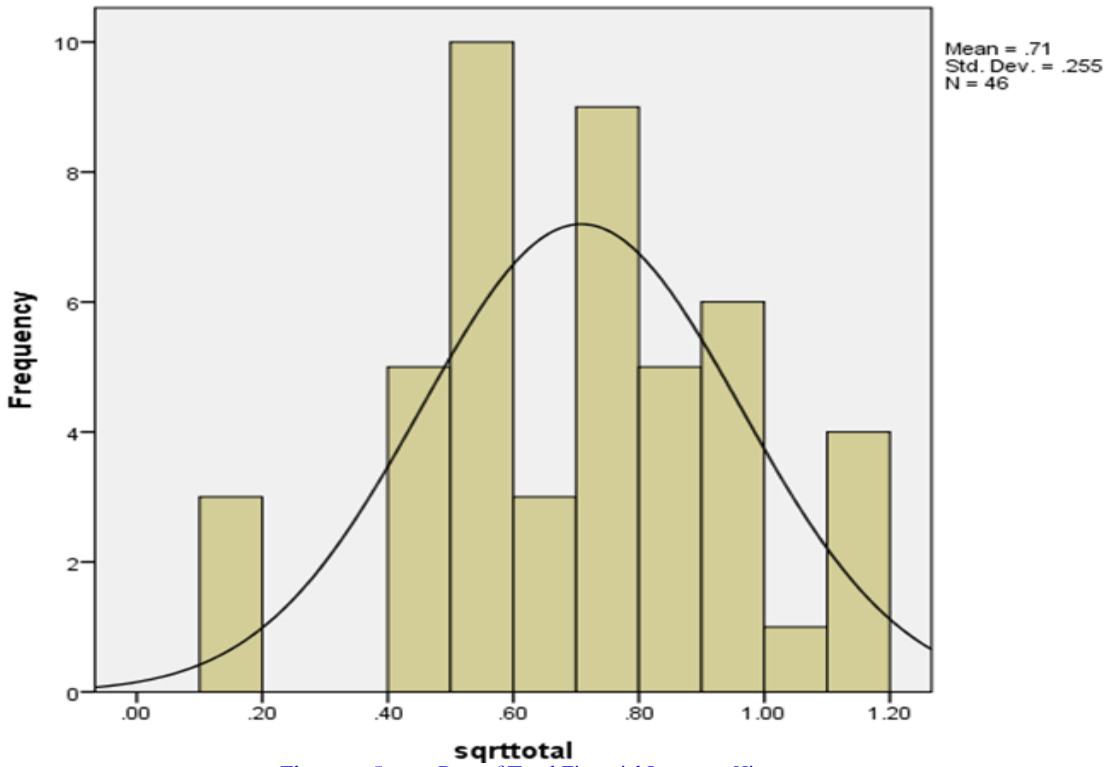

Figure-3. Square Root of Total Financial Leverage Histogram

Regarding the firm's short term debt and long term debt, it is found that both variables are not normally distributed as shown in table (7). The significance level of kolmogrov-smirnov is less than 0.05 which means that both short term debt and long term debt are not normally distributed.

Table-7. Tests of Normality of short and long term debt ratios

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
short term debt ratio	0.172	46	.002	0.850	46	.000
long term debt ratio	0.186	46	.000	0.824	46	.000

Table (7) also indicates that short term debt ratio Kolmogorov-Smirnov significance level (.002) is less than 0.05. Long term ratio Kolmogorov-Smirnov significance level (0.00) is less than 0.05. Thus normality assumption is not met and the results cannot be generalized for all Egyptian companies.

4.4. Correlation Analysis

Due to the nature of the research, we have included some control variables that proved to have a significant impact on the leverage ratio. Therefore, the adopted type of correlation is the partial correlation after transforming the categorical variables such as gender, work experience, educational level, industry, and decision sharing into dichotomous variables /dummy variable to be able to run this technique. Table (8) reveals the correlation matrix after controlling the variables related to firms and managers.

Table-8. Partial Correlation Matrix Results

Control Variables			Optimism	Over-confidence	sqrttotal	Tolerance	Aversion
tenure as CEO/CFO & tenure at the firm & gender & manager age by years & adjusted grade scale & adjusted working experience & firm type & profitability & log size & tangibility & retailing & construction & others & autonomy & sharing	Optimism (dummy)	Correlation	1.000	.293	.592	-.295	-.294
		Significance (2-tailed)	.	.289	.020	.328	.330
	Overconfidence (dummy)	Correlation	.293	1.000	.313	.130	-.221
		Significance (2-tailed)	.289	.	.220	.673	.468
	sqrttotal	Correlation	.592	.313	1.000	.094	-.356
		Significance (2-tailed)	.020	.220	.	.760	.232
	Risk tolerance (dummy)	Correlation	-.295	.130	.094	1.000	-.603
		Significance (2-tailed)	.328	.673	.760	.	.029
	Risk aversion (dummy)	Correlation	-.294	-.221	-.356	-.603	1.000
		Significance (2-tailed)	.330	.468	.232	.029	.

As shown in table (8), the correlation significance between the predictor variables and each other is relatively weak. This can be considered as an indicator of meeting the multicollinearity assumption. The relationship between optimism and overconfidence is positive and very weak (0.293), further, the relationship between optimism and both risk aversion and risk tolerance is negative and very weak (-0.294), (-0.295) respectively. Also, the relationship between overconfidence and risk aversion is negative and very weak (-0.221) and the relationship between overconfidence and tolerance is positive and very weak (0.130).

The correlation coefficient between optimism and the square root of firms' total leverage is (0.592) which can be considered as a moderate positive correlation and significant at 5% significance level. This result supports the empirical prediction as concluded by the previous literature. Regarding overconfidence correlation coefficient with the square root of the total leverage is considered as a weak positive (0.220) and not significant which is an indicator of low predictive power of this variable about the variation in the total leverage. Similarly the correlation coefficient between overconfidence and short term debt is weak and not significant. Further, there is a positive and very weak relationship between risk tolerance and square root of leverage (0.093) and there is a negative and very weak relationship between risk aversion and the square root of leverage.

4.4. Managerial Behavior and Personality Effect

For more exploration of the relationship between the managers' behavior and personality aspects (overconfidence, optimism and risk aversion) and the firms' leverage after controlling managers characteristics and firm related variables, we have conducted a hierarchal regression analysis. Therefore, a hierarchal regression with dummy variables is used to analyze the relationship due to the existence of control variables to examine the prediction power of the managers' behavior after controlling the effect of the control variables. Table (9) displays the betas coefficient of the research variables and their significance level. Moreover, it reveals multicollinearity tests including tolerance and variance inflation factor (VIF).

Table-9. Hierarchal Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.187	1.026		-.183	.858		
	working experience (dummy)	-.024	.028	-.172	-.843	.416	.835	1.198
	profitability	-.348	.661	-.124	-.526	.609	.622	1.607
	log size	.124	.062	.426	1.988	.070	.755	1.324
	tangibility	-.164	.226	-.168	-.723	.483	.641	1.561
	Construction (dummy)	-.252	.176	-.469	-1.433	.177	.324	3.088
	Other industry classifications (dummy)	-.028	.160	-.053	-.172	.866	.360	2.775
	Autonomy (dummy)	.524	.362	.995	1.448	.173	.073	13.609
	tenure as CEO/CFO	-.014	.016	-.229	-.826	.425	.449	2.228
	tenure at the firm	.009	.012	.329	.754	.465	.181	5.510
	Gender(dummy)	-.175	.267	-.148	-.656	.524	.680	1.470
	manager age by years	-.011	.024	-.234	-.458	.655	.133	7.541
	Graduation degree (dummy)	.041	.225	.043	.182	.858	.628	1.593
	firm type (dummy	-.031	.032	-.193	-.960	.356	.856	1.169
	Retailing (dummy)	-.117	.438	-.068	-.267	.794	.539	1.856
	Decision sharing (dummy)	.483	.361	.929	1.340	.205	.072	13.885
2	(Constant)	-.571	1.016		-.562	.589		
	working experience (dummy)	-.051	.035	-.369	-1.450	.185	.451	2.220
	profitability	-1.161	.718	-.414	-1.618	.144	.446	2.245
	log size	.157	.076	.539	2.069	.072	.431	2.319
	tangibility	-.264	.240	-.271	-1.100	.303	.481	2.081
	Construction (dummy)	-.343	.182	-.638	-1.890	.095	.256	3.899
	Other industries (dummy)	-.239	.180	-.462	-1.328	.221	.241	4.148
	Autonomy(dummy)	.416	.394	.790	1.055	.322	.052	19.178
	tenure as CEO/CFO	-.013	.016	-.228	-.819	.437	.376	2.663
	tenure at the firm	.003	.023	.114	.141	.892	.044	22.520
	Gender (dummy)	-.264	.268	-.223	-.984	.354	.571	1.753
	manager age by years	-.003	.037	-.061	-.077	.940	.046	21.780
	Graduation degree (dummy)	.119	.214	.125	.558	.592	.584	1.713
	firm type (dummy)	-.008	.036	-.049	-.223	.829	.599	1.669
	Retailing (dummy)	-.043	.478	-.025	-.091	.930	.383	2.610
	Decision sharing (dummy)	.206	.416	.396	.495	.634	.046	21.916
	Optimism (dummy)	.335	.185	.662	1.808	.108	.218	4.587
	Risk Averse (dummy)	.033	.306	.064	.109	.916	.085	11.785
	Overconfidence (dummy)	.039	.128	.076	.305	.768	.476	2.100
	Risk tolerance (dummy)	.155	.217	.272	.715	.495	.202	4.958

Due to the small sample size, which is one of the main assumptions of the hierarchal regression to meet a specific sample size by considering the number of predictor variable, the predictors are not significant so eliminating the insignificant variables gradually starting by significant level exceeds 0.7 from model number two as depicted in table (9).

Furthermore, we considered a set of assumptions of the regression analysis and the results of testing them to examine the degree of generalization. This includes: (a) multicollinearity assumption, (b) model evaluation, (c). residuals effect, (d) influential cases, (e) normality of the residuals and linearity assumption, and (f) homoscedasticity assumption. The results of testing these assumptions confirmed that our model has satisfied all the assumptions of running the regression analysis.

4.5. Hypotheses Testing

4.5.1. Managerial Overconfidence and Leverage

Based on the previous studies, the overconfident manager tends to use more debt in financing the investment opportunities believing that debt financing is less costly than equity financing in case of accessing the external market. Moreover, the overconfident manager believes that the outside investors underestimate the firm value, underprice the firm stocks and s/he overestimates his/her skill and knowledge in Making the decision with underplaying the associated risk so the first hypothesis is:

H01: there is no significant difference between financial leverage of firms managed by overconfident managers and financial leverage of firms managed by non-overconfident managers.

Accordingly, t-test is a suitable technique to compare between the leverage mean of both groups (i.e. overconfident managers and rational managers). Table (10) reveals that the assumption of equal variance between the scores of the overconfidence and rationality is not violated as the significance level of the row titled by equal variance assumed (0.491) is higher than 0.05 at 95% confidence interval.

Table-10. Independent sample test

		Levene's Test for Equality of Variances			
		F	**Sig.**	**t**	**Sig. (2-tailed)**
Financial leverage	Equal variances assumed	.484	.491	.804	.426
	Equal variances not assumed			.841	.405

By observing the significance level of t-test, table (10) shows that the significance level (0.426) is higher than (0.05) and indicates that there is no significant difference between the leverage level of the firms managed by overconfident managers and the leverage level of the firms managed by non-overconfident managers. Consequently, the null hypothesis is accepted which means that overconfidence has no impact on the firm's debt ratio. Supportably, the scatter plot diagram reveals a relatively semi straight line that indicates the tiny differences in financial leverage between the overconfident manager and non-overconfident manager as illustrated in figure (4) below. Further, we calculated the overconfidence effect size using the following formula of eta square:

T^2/ (T^2+ (N1+N2-2)) = 0.804^2/(0.804^2+(35-2))=0.0192

Hence, the results refer to relatively small/weak effect of the managerial overconfidence on the square root of leverage level in the Egyptian context.

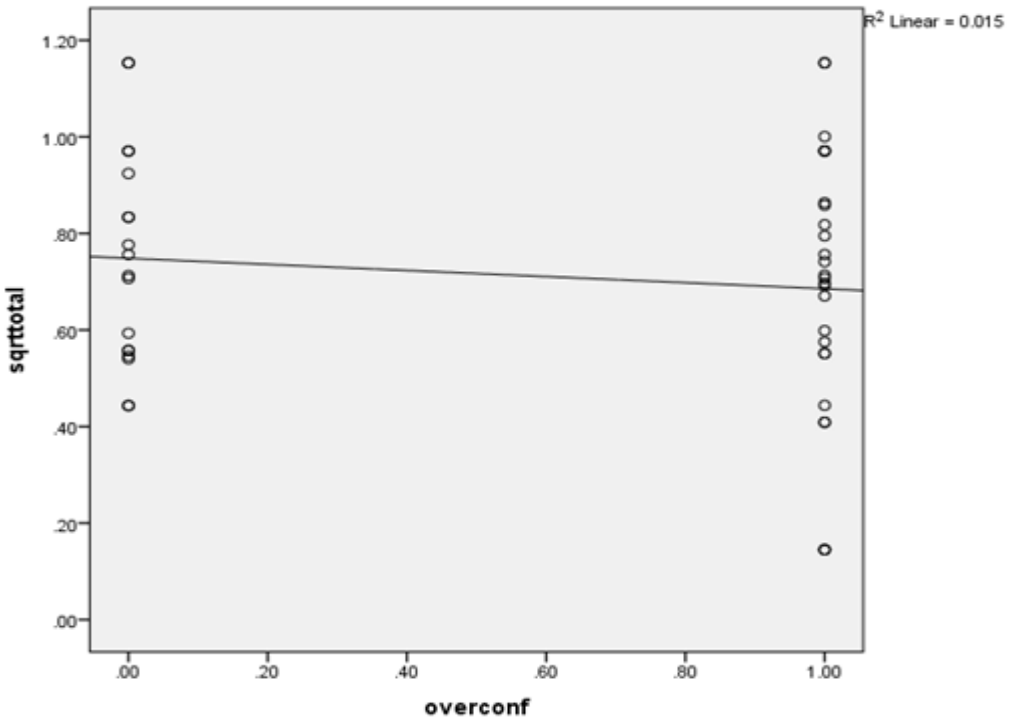

Figure-4. Differences in financial leverage between the overconfident manager and non-overconfident manager

4.5.2. Managerial Optimism and Leverage

Optimistic managers tend to overestimate the possibility of good events and overestimate the future earnings growth. They believe in the firm's performance and overestimate the firm's value. Moreover, they believe that the firm value is underestimated by the outside investors so they rely more on debt than equity in case of accessing the external market. Hence the hypothesis is:

H02: there is no significant difference between financial leverage of firms managed by optimistic managers and financial leverage of firms managed by non-optimistic managers.

Table (11) indicates that the assumption of equal variance between the scores of the optimism and rationality is not violated as the significance level of the row titled by equal variance assumed (0.116) is higher than 0.05 at 95% confidence interval. Also it is found that optimistic managers tend to use more external financing than non-optimistic managers.

Table-11. Independent Sample Test

		Levene's Test for Equality of Variances				
		F	Sig.	t	df	Sig. (2-tailed)
Financial Leverage	Equal variances assumed	2.578	.116	-1.553	41	.128
	Equal variances not assumed			-1.586	40.051	.121

By observing the significance level of t-test, table (11) reveals that the significant level (0.121) is higher than (0.05) and indicates that there is no significant difference between the financial leverage level of the firms managed by optimistic managers and the financial leverage level of the firms managed by non-optimistic managers. However, the scatter diagram reveals that as the manager tends to be optimistic the trend represents a slight increase in the square root of the leverage (refer to figure 5). Moreover, the effect of optimism can be calculated as =-1.553^2/ (-1.553^2+(43-2))= 0.0542 which is relatively moderate level of effect. Consequently, the null hypothesis is rejected which means that firms managed by optimistic managers tend to have more debt ratio.

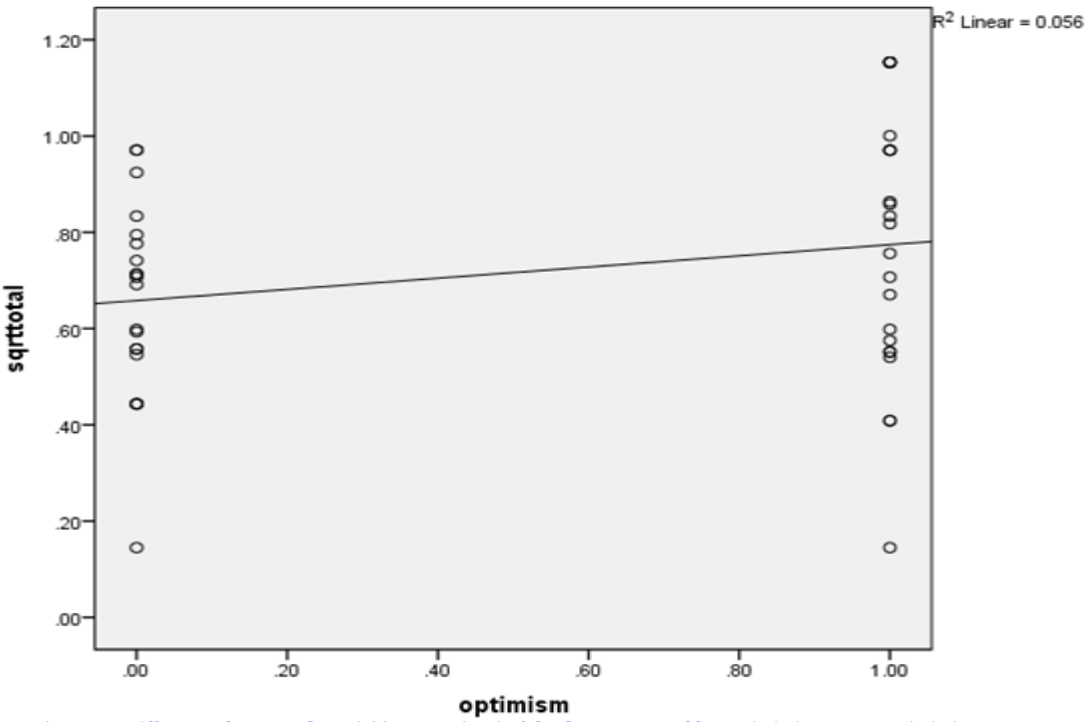

Figure-5. Differences between financial leverage level of the firms managed by optimistic vs non-optimistic managers

4.5.3. Managerial Risk Aversion and Leverage

Risk averse managers tend to reduce the firm's overall risk including the risk associated with issuing debt to finance investment opportunity. Hence, the risk averse manager uses less debt in financing therefore the hypothesis is:

H03: there is no significant difference between financial leverage of firms managed by risk averse managers and financial leverage of firms managed by non-risk averse managers.

Table-12. Independent sample test

		Levene's Test for Equality of Variances			
		F	**Sig.**	**t**	**Sig. (2-tailed)**
Financial Leverage	Equal variances assumed	.776	.384	2.611	.013
	Equal variances not assumed			2.417	.025

By observing the significance level of t-test, table (12) reveals that the significance level (0.013) is less than (0.05) and indicates that there is a significant difference between the leverage level of the firms managed by risk averse managers and the leverage level of the firms managed by non- risk averse managers. Moreover the scatter diagram (figure 6) reveals that the manager tends to be risk averse, the trend represents financial leverage decrease. Also, the effect of the risk aversion can be calculated as 2.611^2/(2.611 ^2+(38-2))= 0.159 which represents a large effect level. Consequently, the null hypothesis is rejected, which means that risk aversion does matter in determining the firms' debt ratio.

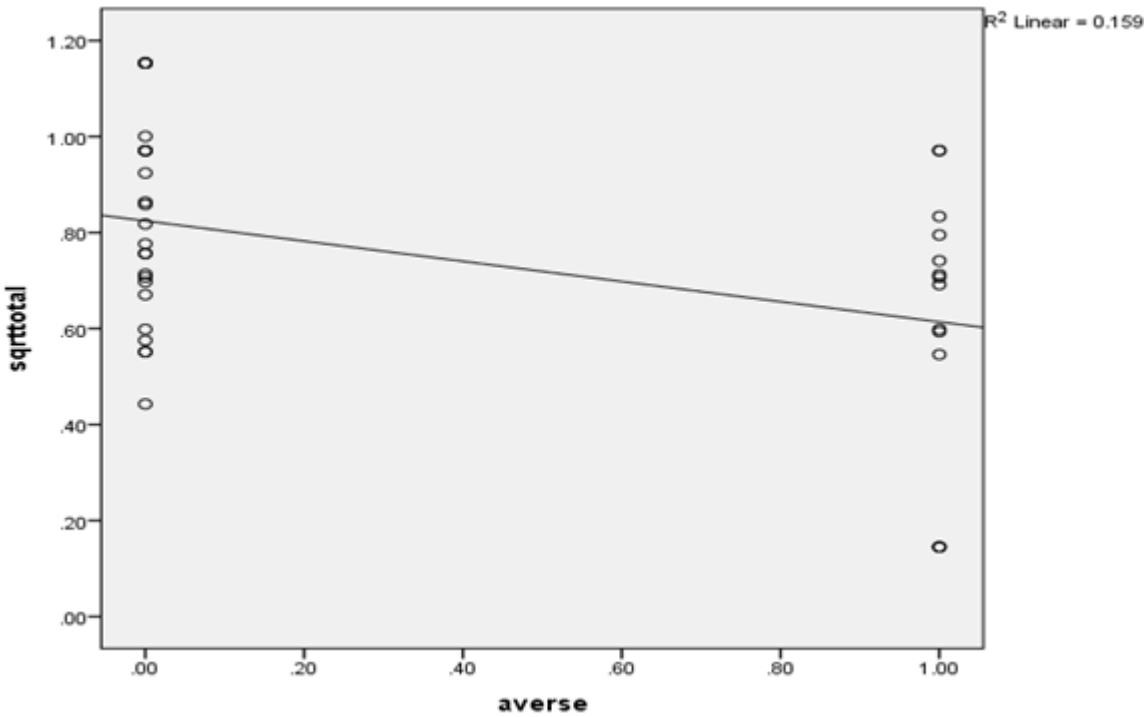

Figure-6. Differences between financial leverage level of the firms managed by risk-averse vs non-risk averse managers

In sum, it can be concluded from the regression analysis that optimism and risk tolerance have a significant impact on the firms' financial leverage, while the overconfidence has no significant impact on firm financial leverage. This finding is consistent with the results of previous studies that examined managerial optimism and risk preference such as Heaton (2002); Hackbarth (2008;2009); Lin *et al.* (2008) and Helliar *et al.* (2005). However, it contradicts the previous studies that launched managerial overconfidence such as Malmendier and Tate (2005); Park and Kim (2009) and Barros and Silveira (2007).

Further, being a risk averse manager differs from non-risk averse in terms of the decrease in the firm's leverage. However, there is a big difference between being an optimistic manager compared to non-optimistic in terms of leverage. Nevertheless, after calculating the effect size, being an optimism manager has a relatively moderate level of effect on the firm's leverage. Finally being overconfident manager has no significant difference compared to being a non-overconfident manager in affecting the firm's leverage.

5. CONCLUDING COMMENTS

The findings of this research effort reveal that the most common factors affect the capital structure are firm's profitability, tangibility, firm size and growth rate. Due to the vital role of the managers and the findings of this study and the previous studies that confirm the managers' behavior and personality impact on the corporate decisions, managers' behavior can be considered as a key factor influencing the capital structure choices.

Overconfident manager tends to underestimate the associated risk with earnings and overestimate the firm's future investment cash flow assuming that outside investors underestimate the firm's value. Therefore, overconfident managers tend to use more debt in financing the investment opportunities and financial needs (Malmendier and Tate, 2005; Barros and Silveira, 2007; Park and Kim, 2009; Malmendier *et al.*, 2011; Antonczyk and Salozmann, 2014). Yet this research finding regarding the impact of the managerial overconfidence on the debt ratio is not significant in the Egyptian context as the first null hypothesis **(H01)** that aims at examining whether the firms managed by overconfident managers differ from the firms managed by non- overconfident manager in terms of the financial leverage ratio is rejected therefore this result contradicts the previous empirical studies' findings.

Managerial optimism is formulated from ego-centrism as stated by Kruger and Burrus (2004) which means that the individuals focus on their own probability of experiencing specific event over the other. Furthermore optimistic managers underestimate the occurrence of bad events so optimistic managers tend to follow pecking order theory which they use internal financing sources at the first resort then debt and finally equity is used because they believe that issuing equity is very costly.

Accordingly, the second null hypothesis **(H02)** that aims at differentiating between firms managed by optimistic and firms managed by non-optimistic managers in terms of the firm financial leverage is accepted which is supporting the previous studies such as Graham *et al.* (2013); Lin *et al.* (2008); Ali and Anis (2012) and Heaton (2002).

Risk averse managers avoid using debt in financing because they overestimate the associated risk with debt (i.e. bankruptcy costs) and equity, therefore risk averse managers prone to use less debt than non-risk averse managers. The third null hypothesis **(H03)** that concerned with assessing the difference of being risk averse manager from being non-risk averse manager in terms of the firm's financial leverage is accepted supporting the findings of Helliar *et al.* (2005); Ali and Anis (2012); Borgia and Newman (2012); Faccio *et al.* (2012) and Milidonis and Stathopoulos (2012).

Overall, our conclusion is that optimism and risk tolerance have significant impact on the total financial leverage while the overconfidence has no significant impact on the firms' financial leverage. Furthermore, since this research is based on a questionnaire survey, therefore, the availability of managers' personal portfolio would have helped the researchers to get another aspect of the managerial overconfidence. Hence, it is recommended that responsible institutions help future researchers getting such information for research purpose, as this would tremendously benefit in exploring other determinants of capital structure

This research based the analysis on data about managers' behavior and linked the questionnaire outcomes to the firms' leverage as a proxy of the capital structure. Unfortunately, we could not maximize the sample size of the respondents to the questionnaire due to the low response rate. Hence, it is suggested to find and create new valid proxies of the managers' behavior and personality aspects and conduct a comparative study with the findings of this study. Further researches are suggested to measure the managers' behavior in a way that can enable future researchers to study the impact of managers' behavior and personality across time. A set of suggestions for the future researches include:

- How the managers' behavior and personality can affect the firms' value
- The impact of managerial behavior on the capital structure of SMEs.
- How managers' behavior can affect the speed of adjustment of leverage.
- How managers' behavior can affect other financial decisions as investment, merger and acquisition and contracting decisions
- Conducting a comparative study between the results under the Egyptian context and other emerging countries in the Middle East such as Saudi Arabia, Kingdom of Bahrain and UAE.
- Considering other dimensions of the overconfidence and test their impact on the financial decisions.
- Developing a dynamic model that combines investment and financing decisions from the behavioral perspective.

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