



Managerial Overconfidence and Accrual-Based Earnings Management: Evidence from Egyptian Listed Firms

Nouran El-Massry*, Ahmed Sakr, Mrwan Amer

Department of Finance, College of Management and Technology, Arab Academy for Science and Technology, Alexandria, Egypt
Email: *Nouranelmasry1@gmail.com

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Abstract

This study investigates whether Managerial overconfidence behavior can explain earnings manipulation using accruals activities in the Egyptian market. In order to reach a conclusion, a sample over the period 2006 to 2020 is analyzed to provide a sample of data about managers' overconfidence behavior and accrual-based earnings management (AB_EM). Further, the results of this study reveal that managerial overconfidence does not impact the manipulation of earnings through discretionary accruals except for companies with a dividend yield of zero. Further, the results reveal that an overconfident manager's behavior affects significantly AB_EM before the revolution as opposed to after the revolution. Finally, this study contributes to the existing literature on overconfidence by analyzing the tendency of overconfident managers to manipulate earnings through discretionary accruals. Further, this study develops adjusted indices and scores to measure managerial overconfidence which would be of great significance for future research conducted in developing markets that are similar to the Egyptian market.

Subject Areas

Behavioral Finance and Accounting

Keywords

Egypt, Overconfidence, Accrual-Based Earnings Management, Micro Economic Events

1. Introduction

The primary purpose of financial disclosure is to accurately and promptly share financial information with the public so that they may assess the company's

performance. Thus, providing financial information in a fashion that allows for the evaluation of past performance as well as the assessment of future profitability and the prediction of company operations is a necessity for attaining this goal [1]. However, since the beginning of the 21st century, the world had witnessed several incidents of accounting manipulations and frauds. Due to these incidents, investors lost faith in the market, which resulted in misleading information regarding earnings. In fact, earnings management is regarded of the key elements of the modern financial world. Since they significantly impact stock markets, investors, creditors, and many other financial institutions, earnings management plays a critical role in income statements and balance sheets. Further, various definitions of earnings management exist, but all definitions share the same concept which is the intentional involvement of a company's management during the accounting disclosure process with the purpose of capturing private benefits. Moreover, earnings management is categorized into accrual-based earnings management (AB_EM) and real-based earnings management (RB_EM) [2]. Along with the importance of earnings management, behavioral finance is also a critical component of modern finance which is considered a form of a financial revolution that occurred in the last 30 years and is still controversial. The fundamental issue is that humans are complicated, corporations are built around real people, and their success is dependent on their actions. Overconfidence bias has received the most attention in the literature on corporate behavioral finance (Baker *et al.*, 2007). As it was quoted by (Plous, 1993) that "Overconfidence is the most pervasive and economically damaging issue concerning judgment and decision-making" [3] [4].

Several previous studies examined the association of managerial overconfidence with different corporate aspects. To comprehend variances in manager's financing decisions, the behavioral finance literature highlights the need of evaluating managers' psychological and behavioral characteristics [5]. Evidently, it was found that overconfidence has a huge impact on managers' decisions [6]. Prior finance research was extended by examining whether managerial overconfidence impacts earnings manipulation [7]. Indeed, overconfident managers opt to participate in earnings management operations in order to meet shareholder demands as well as to attract potential shareholders' attention. [8]. Moreover, the most frequent method of altering financial reporting is earnings management which is implemented through the use of discretionary accruals or the postponing or accelerating of economic operations [9]. Moreover, accruals are the fundamental mechanism that makes financial statements helpful, and the prevalence of accrual-based research in the accounting literature is consistent with the fact that accruals are the primary mechanism that makes financial statements useful [10]. Thus, this study is conducted to investigate how managerial behavior driven by overconfidence in the Egyptian market affects AB_EM by adopting the modified Jones model [11] to measure AB_EM (Campbell *et al.*, 2011) and (Schrand & Zechman, 2012) to measure managerial overconfidence [12] [13].

This study provides an out-of-sample test for earlier research that focuses mostly on developed markets because it focuses primarily on the Egyptian stock market, which is considered one of the developing markets. Further, this study period was chosen primarily because it spans a long time horizon, allowing for a significant number of observations to be analyzed. Moreover, the historical period encompasses many economic cycles, including eras of both expansion and recession. The rest of the study is structured as follows: Section 2 provides a summary of the literature that outlines the theoretical foundation and previous studies related to managerial overconfidence and earnings management as well as the hypothesis development. Section 3 outlines the data collection and sample selection used in this study. Further, in Section 4 results of the study are discussed. Finally, Section 5 summarizes the study's key results, limitations and recommendations.

2. Literature Review

2.1. Basic Economic Theories

This section begins with four theories the agency theory, information asymmetry theory, behavioral finance theory and pecking order theory which will be described in this order. These theories give an insight into why certain actions are performed by managers. In addition, these theories act as a basis for the hypotheses formulation discussed at the end of the chapter.

- Agency theory: A potential agency cost that arises from the agency relationship is the conflict of interests in management decisions that do not maximize shareholder interests [14]. Moreover, managerial overconfidence might be a sign of an agency problem as overinvestment and underinvestment both contribute to the agency cost [15]. So, good capital projects will add value to the company, and it is essential for managers to pursue as many investment projects as possible in order to maximize future benefits for shareholders [16]. However, previous research has shown that managerial overconfidence leads to overinvestment or underinvestment [17]. Hence that inefficient investment indicates managers' conflict of interest with shareholders, which resembles the agency theory formulated by (Jensen and Meckling 1976) [18]. In order to defend their actions, overconfident managers may be interested in manipulating reported earnings [19].
- Information asymmetry theory: The consequences of asymmetric information are significant for shareholders and other decision-makers. The asymmetric information theory's fundamental notion is traced back to three economists [20] [21] [22]. Accordingly, information asymmetry is defined as a problem in financial markets where the seller or lender has more information than the buyer, resulting in market failure [23]. Information asymmetries can lead to conflicts of interest between shareholders and management, resulting in a deviation from the optimal level of investment, or investment inefficiency [18].

- Behavioral finance theory: Behavioral finance is a branch of finance research that examines the theory that investors and managers are not as rational as is thought in traditional finance research [24]. Consequently, according to behavioral finance theory, market players do not make completely rational decisions and their actions are influenced by biases and heuristics [25].
- The pecking order theory: was initially developed by Myers [26]. He suggested that companies generally finance their activities via retained earnings. If the company's earnings are not enough to invest, debt securities are used and lastly, companies will issue shares if retained earnings and debt securities are not available or adequate.

2.2. Accrual-Based Earnings Management

In contrast to statement of cash flows, which only provide information on short-term financial flows, accounting standards are based on accruals that guide companies to disclose accurate and transparent information regarding their financial state [27]. Further, discretionary accruals, are accruals that are determined by the manager's discretion, which are thought to be the consequence of the manager's opportunism because they are not regulated in the contract [28]. Thus, discretionary accruals are part of total accruals that results from particular incentives to manipulate earnings without having an impact on cash flow [29] [30]. So the accumulation of discretionary accruals caused by managing earnings is associated with a change in total accruals [31]. Consequently, in order to meet earnings thresholds, discretionary accrual manipulation involves changing the timing of revenue earned and the time of recognizing cost between periods, such as advancing revenue, delaying asset write-offs, delaying expense recognition and underestimating bad debt expense [30] [32]. As a result, discretionary accruals are used to detect earnings manipulation [33].

Applying AB_EM has its own advantages and disadvantages. So the primary advantage of AB_EM is that has no direct effect on future or current cash flows [34]. However, as the authority on accruals is limited by accounting principles, it is possible that managers may not be able to achieve the desired level of earnings at the end of the year through AB_EM [35]. Another disadvantage that has been demonstrated in previous studies is that auditors frequently restrict managers' use of AB_EM [28] [36].

2.3. Managerial Decisions in the Finance Context

Management decisions from a financial perspective are divided into three categories: first capital budgeting or investment decisions, second capital structure or financing decisions, and third dividend decisions or dividend policies [37]. These financial decisions are considered to be essential factors in a company's ability to deal with its competitive environment. Thus, overconfident managers have two inclinations. The first is overstated investment return, which can easily lead to overinvestment. In sense that overconfident managers will abuse free cash flow and increase overinvestment when companies have adequate cash flow

[38]. The other is an overestimation of the firm's overall revenue, which can easily lead to a lack of investment. When overconfident managers overestimate the company's overall prospects, the cost of funding is underestimated, resulting in underinvestment. Consequently, due to the aversion to external financing, the overconfident manager would underinvest when the company's cash flow is insufficient to meet the cost of capital [5]. So overconfident managers, according to both opinions, constantly reduce their investment efficiency. Biased manager's preference for higher debt is confirmed by (Huang *et al.*, 2016) and (Mundi and Kaur, 2022) as they argued that overconfident managers have high expectations for future cash flows, in which they believe that stock financing is more expensive than debt financing, thus they prefer to issue debt instead of equity when internal sources are not sufficient [39] [40].

There are two lines of research on the link between managerial overconfidence and dividend policy in literature. The first line of research suggests that overconfident managers tend to distribute higher dividends. Namely, overconfident managers foresee bigger future cash flows and are more likely to pay out higher dividends [41]. The second line of research provides a different scenario in which overconfident managers tend to payout lower dividends. Namely, managers that are overconfident are less likely to pay dividends because they believe they can generate larger returns for shareholders by investing in their companies' projects, even if these projects may devalue the company [41].

2.4. Managerial Overconfidence and Accrual-Based Earnings Management

Overconfidence is the inclination for people to think they know more than they do or that their information is accurate, which leads to expectations that are higher than what an objective assessment would suggest (Bhandari and Deaves, 2006). As a result, managers' strong confidence demonstrates managerial optimism, which can lead to bias when making choices, and thus frequently engaging in earnings management to mask corporate performance that falls short of their expectations [13]. Thus overconfidence among managers may lead to accounting choices that are more or less discretionary [8].

Regarding the investment proxy of overconfidence, it was suggested in previous studies that companies with overconfident managers tend to release promising earnings forecasts as well as overestimate upcoming returns from investments to coincide with the disclosed earnings forecasts [7] [8]. Moreover, regarding the financing proxy of overconfidence, it was found that higher financial leverage increases the practice of earnings management, in the sense that companies suffering from debt are more likely to engage in earnings management in order to maintain creditors' perceptions of their safety [42]. Finally, in regard to the last indicator of overconfidence, dividends are considered a significant barrier for managers hence they overcome this barrier by counteracting the fall in payout ratios by managing earnings downward [43].

Few studies investigated the effect of managerial overconfidence behavior on

the quality of accounting disclosure in the context of AB_EM. A study conducted for 744 publicly listed companies in Taiwan covering the period from 2006 through 2012 confirmed that managers with overconfident characteristics tend to engage in upwards AB_EM [44]. On a similar note, another study examined the effect of managerial overconfidence on AB_EM over a nine-year period, from 2009 to 2017, in 115 firms Iranian listed companies [45]. They concluded that managerial overconfidence has a positive impact on AB_EM. Also, another study conducted for Chinese listed firms during the years 2000 to 2018, and for Taiwanese listed firms covering a period during the years 2001 to 2009 concluded that there is a positive relation between managerial overconfidence and AB_EM [46] [47]. On the other side, a study conducted for 127 Brazilian companies in the year 2014 implied that managerial overconfidence has a negative impact on the AB_EM [8]. Moreover, a study conducted for all firms listed in CRSP/COMPUSTAT merged database over a period of 1991 to 2009, concluded that managerial overconfidence does not affect AB_EM [48]. Since there are few researches that examine the association between managerial overconfidence and earnings management. Thus, the main goal of this study is to fill the gap created by the scarcity of studies by looking into the impact of managerial overconfidence on the adoption of earnings management practices in the Egyptian market. These studies assume that managers' overconfidence will likely have an impact AB_EM practice, which forms the basis for the development of the general hypothesis that directs this study:

H1: There is a positive relationship between managerial overconfidence and AB_EM.

3. Data and Methodology

3.1. Data and Sampling

All variables in this study are firm-specific variables based on secondary data extracted from Osiris financial database for non-financial companies listed on the Egyptian stock exchange. The data were obtained for the years 2005 to 2020. This study period was selected primarily because it encompasses a wide time frame and helps with the analysis of a large number of observations. Investment firms, leasing, credit and financial institutions, and banks are not included in the chosen sample because they have quite distinct natures in terms of reporting and ownership structure [1]. Consequently, the final sample consists of 165 companies. Despite the fact that the data was obtained for the years 2005 to 2020, the sample used in the study begins in 2006. This is mostly because various variables in this study are estimated as changes over time.

3.2. Research Model and Measurement of Variables

AB_EM in the Egyptian market, therefore the main dependent variable is discretionary accruals which are measured by adopting the modified Jones model [11], whereas the independent variable is managerial overconfidence which is meas-

ured using (Schrand and Zechman, 2012) and (Campbell *et al.* 2011) [12] [13].

This research model can be expressed as follows:

$$AB_EM = a + \beta_1 OC_{FIRM1} + \beta_2 OC_{FIRM2} + \beta_3 OPT + \beta_4 ROA + \beta_5 size + \varepsilon \quad (1)$$

where:

AB_EM = The discretionary accruals of firm i and year t ;

OC_{FIRM1} = A score for each company based on its investment and financing activity as measured by two indicators;

OC_{FIRM2} = A score for each company based on its investment and financing activity as measured by three indicators;

OPT = Industry adjusted investment rate.

The remaining explanatory variables in the equation are control variables. These variables are defined below.

ROA = The net income divided by total assets for a firm in year t ;

$SIZE$ = The logarithm of total assets for a firm in year t . (Table 1)

3.3. Managerial Overconfidence

Financial and investment decisions are correlated with managerial overconfidence [7] [13]. Specifically, decisions made regarding investments and finance could provide insight into the level of managerial overconfidence [12]. Accordingly, three overconfidence proxies based on the investment and finance choices of the current manager will be employed in this study.

3.3.1. Managerial Overconfidence Firm-Investing and Financing Score Proxies

Based on previous studies, managerial overconfidence is measured using two proxies built on firm investing and financing activities [13]. The first proxy is an index that consists of four indicators, which are XSINVEST_INDADJ, ACQ_INDADJ, DERATIO_INDADJ and RISKYDT, while the second proxy is an extension of the first one with the addition of the DIVYLD as an additional indicator.

Excess investment in the industry after adjustment is the first indicator of the score, which is the company’s residual after subtracting the industry median

Table 1. The calculation of the final sample.

	Observations
Firm year observations 2006-2020 Osiris Annual files database, EGX listed firms	3360
Deleting missing data, regulated industries and financial institutions	-903
Observations used to calculate OC_FIRM1, OC_FIRM2, OPT, FIRM SIZE and ROA variables	2457
Deleting missing data on AB_EM	-538
Total	1919

residual from a regression of total asset growth on sales growth denoted as XSINVEST_INDADJ. If the company's investment level exceeds the same year's median level for the industry, the company will be given a score of 1 suggesting that managers are overconfident and will be given a score of 0 otherwise.

The industry-adjusted net dollars of the company's acquisitions, denoted as ACQ_INDADJ, serve as the second indicator of the score, which is obtained from the statement of cash flows. So, if a company's net acquisitions are higher than the same-year median for the industry, it will receive a score of one suggesting that managers are overconfident and will be given a score of 0 otherwise.

The company's industry-adjusted debt-to-equity ratio denoted as DERATIO_INDADJ serves as the third indicator of the score. It is equal to long-term debt divided by the company's market value, less the industry median for the year. If a company's ratio of long-term debt to equity is higher than the average for the industry for a given year, it will receive a score of 1 suggesting that managers are overconfident and will be given a score of 0 otherwise.

The fourth indicator of the score is determined according to whether the company issues convertible debt or preferred stock denoted as RISKYDT. A score of 1 will be given if the company issues convertible debt or preferred stocks suggesting that managers are overconfident and will be given a score of 0 otherwise.

Finally, Schrand and Zechman (2012) proposed the company's dividend policy as a fifth indicator of overconfidence. They calculate a company's dividend yield denoted as DIVYLD and argue that companies with a dividend yield of zero will be given a score of 1 suggesting that managers are overconfident and will be given a score of 0 otherwise [13]. This measurement is based on (Ben-David *et al.*, 2007) in which they argued that managers who are overconfident are less inclined to pay dividends in order to save money for future investment opportunities [41]. Dividend policy is treated separately since it might be a proxy for both firm characteristics and overconfident managers [13]. The debt-to-equity ratio is likely to have a similar issue, but given the tendency toward an industry norm, industry-adjusted debt-to-equity ratio mitigates the problem [49].

The first proxy is calculated based on the first four indicators which are XSINVEST_INDADJ, ACQ_INDADJ, DERATIO_INDADJ and RISKYDT. The manager of a company will be considered overconfident if the company receives a score of 2 or above in a certain year. Moreover, the second proxy is an extension of the first one with the addition of the DIVYLD as an additional indicator. The manager of a company will be considered overconfident if the company receives a score of 3 or above in a certain year.

The measure of overconfidence proposed by Schrand and Zechman (2012) is biased in favor of developed markets. In order to account for developing markets, M&A, preferred stocks, and convertible debts are eliminated from the firm specific scores in this thesis since they are not a commonly used practice for companies listed on the Egyptian stock exchange [13]. Thus, based on previous researches, this study contributes to current literature by adjusting the previous-

ly mentioned indices to accommodate the Egyptian market. The constructed measures consist of two indices serving as proxies for managerial overconfidence, namely OC_FIRM1 and OC_FIRM2. The former includes XSINVEST_INDADJ, and DERATIO_INDADJ, while the latter adds DIVYLD as an additional indicator. Regarding OC_FIRM1, the manager is considered overconfident if a company has a total score of 1 or above in a certain year. In addition, regarding OC_FIRM2 the manager is considered overconfident if a company has a total score of 2 or above in a certain year.

3.3.2. Managerial Overconfidence Investment Level Proxy

Firm investing activities and financing activities, which are two indices that serve as the first proxies for measuring managerial overconfidence, may be linked to weaker governance [13]. As a result, Campbell *et al.* (2011)'s managerial overconfidence proxy, which focuses solely on investment levels in relation to the industry mean, will be employed in this study [12]. They use companies' industry adjusted investment levels to generate indicator variables for managerial optimism as an alternative measure of optimism. The influence of managers' optimism on the investment level they set for their company can be beneficially mitigated by their risk aversion [12]. A risk-averse manager with a low level of optimism underinvests, that is, invests less than what increases the company's value. A moderately optimistic manager, on the other hand, will prefer to invest at an optimal degree that will increase shareholder's value. As a result, as manager's optimism rises, the company's investment level rises, countering the manager's underinvestment risk aversion characteristics. When optimism is below (above) the level that maximizes the company's value, the manager will underinvest (overinvest), resulting in a concave relationship between company's value and manager optimism [12].

Consequently, they suggest a measure of managerial overconfidence based on Equation (2):

$$OPT_t = CAPEX_t / PPE_{t-1} \quad (2)$$

where:

OPT_t = The firm industry adjusted investment rate;

$CAPEX_t$ = Capital expenditure at year t ;

PPE_{t-1} = Net property, plant and equipment at the beginning of year t .

For two years in a row, Campbell *et al.* (2011) categories a manager as overoptimistic if the company's investment adjusted rate to the industry OPT_t in Equation (2) is above the 80th percentile of all companies and is denoted as OPT_{80-t} [12]. On the other hand, they label managers as pessimistic if the company's OPT_t falls below the 20th percentile of all companies for two years in a row and is denoted as OPT_{20-t} . Managers who do not fall into either of these two categories are considered moderately optimistic. The purpose behind categorizing investments for two consecutive years is because they are usually "lumpy" over time, and they don't want to label a manager as overconfident merely because he or she chooses to group investment in one year.

3.4. Accrual-Based Earnings Management

Through the adoption of the modified Jones model, discretionary accruals serve as the proxy for AB_EM [11]. The total accruals are calculated in the below equation using the cash flow statement approach based on [50].

$$TA_t = EBXI_t - CFO_t \quad (3)$$

where:

TA_t = Total accruals at the end of year t

$EBXI_t$ = Earnings from extra ordinary items and discontinued operations in year t

CFO_t = Cash flow from operations in year t

The following regression equation is used to identify the firm specific parameters that will be used in the modified Jones model to calculate the non-discretionary accruals equation

$$TA_t/A_{t-1} = a_1(1/A_{t-1}) + a_2(\Delta REV_t/A_{t-1}) + a_3(PPE_t/A_{t-1}) + \varepsilon_t \quad (4)$$

where:

TA_t = Total accruals at the end of year t

ΔREV = The change in revenues at the end of year t

PPE_t = Gross property plant and equipment at the end of year t

a_1 , a_2 , and a_3 are firm-specific parameters;

ε_t = The residual, which represents the firm-specific discretionary portion of total accruals.

Additionally, using all firm-year observations, non-discretionary accrual is computed cross-sectional each year using the following equation.

$$NDA_t = a_1(1/A_{t-1}) + a_2((\Delta REV_t - \Delta REC_t)/A_{t-1}) + a_3(PPE_t/A_{t-1}) \quad (5)$$

where:

ΔREC_t = net receivables in year t less net receivables in year $t - 1$.

Finally, after calculating the non-discretionary accruals adjusted for change in receivables, the discretionary accruals will be derived from the total accruals as follows:

$$DA_t = TA_t - NDA_t \quad (6)$$

3.5. Control Variables

This study examines the effect of managerial overconfidence on AB_EM activity regression models that control for two factors that may influence earnings management. Based on prior research, two control variables—firm characteristic measured by firm SIZE, and firm performance measured by ROA—are incorporated to the model into control for significant variations in AB_EM that could include measurement errors that are correlated with these variables [11].

$SIZE_t$ = The natural logarithm of total assets for a firm in year t

Return-on-assets (ROA_t) = The net income divided by total assets for a firm in year t

4. Findings and Analysis

In this section, the descriptive statistics will be presented first, followed by the correlation analysis, and finally, the regression analysis results will be shown and reviewed to determine whether the hypothesis is valid or not. Further, the Hausman test is used to determine whether panel data with fixed effects or panel data with random effects should be used [1]. This test is based on whether or not there is a relationship between the independent variables and the regression error. If such a relationship exists, the random effects model will be employed; otherwise, the fixed effects model will be applied. In this study, a fixed-effects regression is applied as the calculated chi-square statistic is less than 0.10 as shown in **Table 2**. Further, the analysis was performed using Stata 17 software.

4.1. Descriptive Statistics

The mean, median, standard deviation, minimum, and maximum of observation are among the descriptive outcomes of this study, as shown in **Table 2**. The results of the first dependent variable, AB_EM using modified Jones model for the chosen sample reveals that the mean, standard deviation, minimum and maximum are (-0.01), (0.16), (-0.67) and (0.66) respectively as shown in **Table 2**. This suggests that on average, around (1%) of the AB_EM used by the chosen sample in Egypt are in a downward direction, implying that the earnings level is being manipulated by lowering it. However, the small magnitude could be explained by manager's ability to manipulate earnings both upwards and downwards reducing the net result of mean AB_EM.

The results of the first managerial overconfidence proxy (OC_FIRM1) for the chosen sample reveal that the mean, standard deviation, minimum and maximum are (0.61), (0.49), (0) and (1) respectively as shown in **Table 2**. This suggests that on average, around (62%) of managers in the studied firms are overconfident which is attributed to both financial leverage and excess investment. It implies that the studied firms have a debt to equity ratio that is higher than the industry median. Consequently, those managers are overconfident because overconfident managers are more inclined to increase debt rather than finance their investments using stocks when a company's equity is undervalued by the public. Also, the studied firms have investment levels that exceed the industry median. Consequently, those managers are overconfident as they underestimate the risks of payoffs while also overestimating the cash flows of an investment opportunity. The results of the second managerial overconfidence proxy (OC_FIRM2) for the chosen sample reveal the mean, standard deviation, minimum and maximum (0.61), (0.48), (0) and (1) respectively as shown in **Table 2**. This suggests that on average, around (61%) of managers in the studied firms are overconfident after adding the dividends yield measurement to the index implying that the studied firms have overconfident managers as they are less inclined to pay dividends in order to save money for future investment opportunities.

Table 2. Descriptive statistics.

Variables	Count	Mean	SD	Min	Max
AB_EM	1919	-0.01	0.16	-0.67	0.66
OC_FIRM1	1919	0.62	0.49	0.00	1.00
OC_FIRM2	1919	0.62	0.49	0.00	1.00
OPT	1919	0.07	0.26	0.00	1.00
SIZE	1919	4.79	0.88	2.71	6.80
ROA	1919	0.06	0.11	-0.35	0.44
N	1919				

The descriptive statistics for all models are shown in this table. The mean, standard deviation, minimum, and maximum values are presented respectively. N is the final number of observations for the selected sample. AB_EM refers to discretionary accruals computed from the Modified Jones Model. OC_FIRM1, OC_FIRM2 and OPT are measures of managerial overconfidence. SIZE is calculated as the log of total assets. ROA is the return on assets calculated as net income divided by total assets.

The results for the last proxy of managerial overconfidence (OPT) for the chosen sample reveal that the mean, standard deviation, minimum and maximum are (0.07), (0.26), (0) and (1) respectively as shown in **Table 2**. This suggests that on average, around (7.4%) of managers in the studied firms are overconfident by focusing entirely on investment levels relative to the industry mean as opposed to the first two proxies which focus on both financing and investing activities together.

4.2. Pearson Correlation Matrix

The correlation matrix is presented in **Table 3**. The results reveal that OC_FIRM1, OC_FIRM2 and OPT are significantly positive at the 1% level, thus indicating managerial overconfidence variables are indeed very highly related. In addition, the correlation between managerial overconfidence variables and AB_EM, demonstrates that there is a low positive correlation among OC_FIRM1, OC_FIRM2, OPT and AB_EM, and there is also a low positive correlation between OPT and size and between OPT and ROA. Moreover, firm SIZE is significantly positively correlated with AB_EM, OC_FIRM1 and OC_FIRM2, at the level of 1%. Finally, ROA is found to be significantly positively correlated with AB_EM, and SIZE at 1%, whereas significantly negatively correlated with OC_FIRM2, at the level of 1%.

4.3. Regression Analysis

In this section, the dependent variable AB_EM is tested on the three managerial overconfidence proxies which are OC_FIRM1, OC_FIRM2 and OPT, as well as controlling for firm characteristics and financial performance. As shown in **Table 4**, the AB_EM model is significant at the 1% level. Further, the adjusted R-squared statistic is 20% which is consistent with prior studies of (Sutrisno *et al.*, 2019)

Table 3. Pearson correlation matrix.

	AB_EM	OC_FIRM1	OC_FIRM2	OPT	SIZE	ROA
AB_EM	1					
OC_FIRM1	0.0318	1				
OC_FIRM2	0.0019	0.7560***	1			
OPT	0.0144	0.0564***	0.0678***	1		
SIZE	0.1261***	0.1777***	0.1011***	0.0329	1	
ROA	0.3588***	-0.0935***	-0.2197***	0.004	0.0847***	1

The Pearson Correlation Matrix for all variables in the AB_EM model is shown in this table. AB_EM refers to discretionary accruals computed from the Modified Jones Model. OC_FIRM1, OC_FIRM2 and OPT are measures of managerial overconfidence. SIZE is calculated as the log of total assets. ROA is the return on assets calculated as net income divided by total assets. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Regression results of AB_EM for the full sample.

Variables	Coefficient	P value
constant	-0.13	0.00
OC_FIRM1	0.00	0.93
OC_FIRM2	0.03	0.06*
OPT	0.01	0.55
SIZE	0.02	0.01*
ROA	0.62	0.00***
Chi square	0.01	
R squared	0.21	
Adjusted R squared	0.20	
P value	0.00	
N	1919	

This table presents a regression of accrual-based earnings management against managerial overconfidence and other control variables. Regression was carried out in USD for all companies in the selected sample. The dependent variable in this regression is AB_EM, which refers to discretionary accruals computed from the Modified Jones Model. The independent variables in this regression are OC_FIRM1, OC_FIRM2 and OPT, which are measures of managerial overconfidence. OC_FIRM1 is an index based on two firm investing and financing indicators. OC_FIRM2 is an index based on three firm investing and financing indicators. OPT is defined as capital expenditure divided by the beginning of year PP&E. The control variables in the regression are SIZE and ROA. SIZE is calculated as the log of total assets. ROA is the return on assets calculated as net income divided by total assets. N is the final number of observations for the selected sample. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

and (Dal Magro *et al.*, 2018) [8] [28]. This demonstrates that managerial overconfidence represents 20% of the variability of AB_EM.

Referring to **Table 4**, the managerial overconfidence variable OC_FIRM2 is positive and significant at the 10% level with the p-value of 0.057. Whereas the managerial overconfidence variables OC_FIRM1 and OPT have p-values of 0.92 and 0.54 respectively thus they are considered insignificant. Since dividend yield might serve as a proxy for both firm characteristics and managerial overconfidence, thus the positive significant association of OC_FIRM2 by itself might be attributed to firm characteristics rather than overconfidence as the rest of the managerial overconfidence proxies are insignificant [13]. The insignificant relationship between AB_EM and managerial overconfidence is in line with the research findings of (Hsieh *et al.*, 2014) across companies internationally. However, this insignificant relationship contradicts the research findings of (Li and Hung, 2013) and (Chang *et al.*, 2018) for Taiwanese-listed firms, (Ahmadi *et al.*, 2020) for Iranian-listed firms and (Zhou *et al.*, 2020) for Chinese Mainland-listed firms who argue that there is a positive relationship between AB_EM and managerial overconfidence [44] [45] [46] [47] [48]. Further, the insignificant relationship contradicts the research findings of (Dal Magro *et al.*, 2018) for Brazilian-listed firms who argue that firms with overconfident managers tend to engage in income-decreasing AB_EM [8].

Regarding the control variables, the result shows that firm SIZE is positive and significant at a 1% level. This is in line with the research of (Asim and Ismail, 2019) for Pakistani listed companies and for (Chang *et al.*, 2018) for Taiwanese listed firms [44] [51]. In their research, they argue that large companies have a larger indication of AB_EM. However, the positive relationship contradicts the research findings of (Wijaya *et al.*, 2020) for Indonesian-listed and (Salehi *et al.*, 2020) for Iranian-listed firms and who found that there is no relation between AB_EM and firm SIZE [1] [52]. This might arise due to the pressure faced by large companies to manipulate earnings in order to match analyst expectations [51]. On the other side, the positive relationship contradicts the research findings of (Al-Absy *et al.*, 2020) for Malaysian listed firms who found that there is a negative relation between AB_EM and firm size [53].

Moreover, the result shows that ROA is significant and positive at the level of 1%. This is in line with the previous results of (Alexander and Hengky, 2017) for Indonesian listed firms and of (Al-Absy *et al.*, 2020) for Malaysian listed firms [53] [54]. This might be due to management motivation to perform earnings management to reach the minimal level to receive bonuses when the company's profit is below the actual performance requirements for bonuses [54]. However, the positive relationship between AB_EM and ROA contradicts the research findings of (Shirzad *et al.*, 2015) for Iranian-listed firms who found that there is a negative relation between ROA and AB_EM [55].

According to the results of this study, it can be argued that overconfident managers for companies listed in the Egyptian market have no effect on AB_EM except for a partial test through OC_FIRM2 proxy, which provides partial support for hypothesis H1. That arises when overconfident managers believe

AB_EM will be discovered by auditors and hence might damage their reputation which is in line with the research of (Sutrisno *et al.*, 2019) [28]. In particular, after the establishment of the Egyptian Corporate Governance Code (ECGC, 2011) which aids in the oversight of managerial reporting conduct for the benefit of public stakeholders, leading to greater audit quality and, in turn, higher earnings quality, which is demonstrated by a lower AB_EM [36]. Further, this is also supported by the results in **Table 2** which reveal that the magnitude of AB_EM in the Egyptian market is minute.

4.4. Robustness Check

To obtain more robust results, further analysis is conducted in this section to determine the effect of several macroeconomic events on AB_EM model by separating the sample into before and after the Egyptian revolution of 2011. This is done by dividing the full sample into two subsamples, the control sample (before the revolution) which covers the period from 2006 to 2010 and the test sample (after the revolution) which covers the period from 2011 to 2020. As shown in **Table 5**, a fixed-effects regression will be applied for AB_EM model in test sample as the calculated chi-square statistic is less than 0.10, however, a random effect regression will be applied to the control sample as the calculated chi-square statistic is more than 0.10.

For the behavioral bias of managerial overconfidence, the results show a difference between the two subsamples. As can be seen for the test sample in **Table 5**, the managerial overconfidence variable OC_FIRM1 is positive and significant at the 10% level with the p-value of 0.06. Whereas the managerial overconfidence variables OC_FIRM2 and OPT have p-values of 0.25 and 0.21 respectively thus they are considered insignificant. Hence, there is no significant relationship between managerial overconfidence and AB_EM except throughout a partial test of OC_FRIM1. On the other side, the results of the control sample in **Table 5**, reveal that there is no relationship between all managerial overconfidence variables and AB_EM as p-values for all proxies are greater than 0.1. Even though there is a minor difference between the two subsamples in regards to the relation between overconfidence and AB_EM, the model in the control sample has a higher R squared relative to the test and full sample which provides a better explanation for the variability of AB_EM.

The results of the further analysis prove that there is a difference in the contribution of an overconfident manager's behavior before and after the revolution. The regression results of the control sample are different from those of the test and full sample. Indeed, the regression results show that overconfident manager's behavior affects AB_EM before the revolution whereas after the revolution overconfident manager's behavior does affect AB_EM. Therefore, this provides support for the partial rejection of the hypotheses in this study in the sense that the insignificant relationship might be due to the macroeconomic events that the Egyptian economy has witnessed over the last decade.

Table 5. Regression results for AB_EM before and after the Egyptian revolution.

Model	Control sample		Test sample	
Variables	Coefficient	P value	Coefficient	P value
constant	1.38	0.04	-0.10	0.002
OC_FIRM1	0.07	0.06*	-0.01	0.881
OC_FIRM2	0.03	0.25	0.02	0.152
OPT	0.06	0.21	-0.01	0.451
SIZE	-0.30	0.03**	0.01	0.053
ROA	1.32	0.00***	0.69	0.00***
Chi square	0.00		0.25	
R squared	0.71		0.21	
Adjusted R squared	0.50		N/A	
P value	0.00***		0.00***	
N	582		1337	

This table presents a regression of accrual-based earnings management against managerial overconfidence and other control variables. Regression was carried out in USD for all companies in the selected sample. The regression is applied for both the control sample which is prior to the Egyptian revolution and the Test sample which is after the Egyptian revolution. The dependent variable in this regression is AB_EM, which refers to discretionary accruals computed from the Modified Jones Model. The independent variables in this regression are OC_FIRM1, OC_FIRM2 and OPT, which are measures of managerial overconfidence. OC_FIRM1 is an index based on two firm investing and financing indicators. OC_FIRM2 is an index based on three firm investing and financing indicators. OPT is defined as capital expenditure divided by the beginning of year PP&E. The control variables in the regression are SIZE and ROA. SIZE is calculated as the log of total assets. ROA is the return on assets calculated as net income divided by total assets. N is the final number of observations for the selected sample. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

5. Conclusion, Limitations and Future Recommendations

The aim of this study is to identify the impact of overconfident managers on AB_EM for Egyptian companies during the period from 2006-2020. In addition, by dividing the sample into before and after the Egyptian Revolution of 2011, further analysis is carried out to determine the impact of numerous macroeconomic events on AB_EM. This is conducted by dividing the full sample into the control sample (taken prior to the revolution) and the test sample (taken following the revolution).

The results of this study illustrate some interesting conclusions from a financial and economic perspective. Additionally, it contributes knowledge regarding managerial overconfidence and earnings management. In general, the results are significant for stakeholders and investors in developing countries because they depend on the reported financial information to make investments and other decisions. The findings are also of great significance for future researchers who intend to conduct additional research on overconfidence and earnings manage-

ment in the Egyptian market.

According to the results, it was found that there is an insignificant relationship between managerial overconfidence and AB_EM except through partial testing of OC_FRIM2. Hence, the H1 is partially accepted. To put it another way, Egyptian overconfident managers do not manipulate accounting reports through discretionary accruals. That occurs when overconfident managers believe that auditors will detect the manipulated accounting reports through AB_EM and hence might damage their reputations. Particularly since the adoption of the Egyptian Corporate Governance Code (ECGC, 2011), which supports the oversight of managerial reporting resulting in higher earnings quality, which is evidenced by a lower AB_EM [36]. The results are consistent with the findings of Hsieh *et al.* (2014) [48]. Controversially, results contradict the research findings of (Li and Hung, 2013), (Chang *et al.*, 2018), (Ahmadi *et al.*, 2020) and (Zhou *et al.*, 2020) [8] [44] [45] [46] [47].

The results of the further analysis reveal that overconfident manager's behavior AB_EM before the revolution as opposed to after the revolution. Therefore, this provides support for the partial rejection of the hypotheses in this study in the sense that the insignificant relationship might be due to the macroeconomic events that the Egyptian economy has witnessed over the last decade.

The primary limitation of this study is the choice of proxies for measuring managerial overconfidence. There are a number of proxies suggested in previous studies for measuring overconfidence; however, the overconfidence measure employed for the Egyptian market was two of them. Although they are the most accurate measurements that can be used in the Egyptian market, they might not accurately reflect managers' overconfidence bias as not all regularly used managerial overconfidence proxies could be applied to the Egyptian market due to the lack of data and practical issues. In addition, the manager's particular behavioral characteristic also might be a drawback, because this study is limited by the manager's single behavioral bias overconfidence. Finally, it is still unclear whether the modified Jones model can accurately separate accruals into non-discretionary and discretionary components. As a result, there is a chance that non-discretionary and discretionary accruals will be misclassified. Hence, the insignificant relation between discretionary accruals and some measures of managerial overconfidence may be explained if some non-discretionary accruals components are incorrectly categorized as discretionary accruals.

This study emphasizes that the findings are subject to some limitations and hence it ends with some recommendations for future research. First, an ample examination of other AB_EM proxies as well as managerial overconfidence proxies is left for future research. Additionally, future research might consider managerial overconfidence from different perspectives of accounting information disclosure quality, such as timing and persistence. Finally, future research might take into account macroeconomic variables such as the political instability index to measure accurately the impact of macroeconomic events on overconfidence.

Conflicts of Interest

The authors declare no conflicts of interest.

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