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## **Real Earnings Management versus Accrual-based and Its Effect on Firm Performance: Evidence from Egypt**

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### **Abstract:**

This paper empirically investigates whether Egyptian firms use real activities manipulation to substitute accrual-based earnings management, and what is the effect of real earnings management on operating performance for a sample of firms listed on the Egyptian Stock Exchange during the period from 2000 through 2014. Results demonstrate that: First, Egyptian firms employ both accrual-based and real earnings management to achieve earnings targets. The two mechanisms are used simultaneously, no complete substitutive relation between the two strategies. Second, Egyptian managers do not alter their earnings management techniques to cope with corporate and political events. This is evident in the passive response for the introduction of Egyptian Accounting Standards in 2007 and the Egyptian Revolution of 2011. Third, real activities manipulation has an adverse effect on Egyptian firms' performance, where real earnings management metrics are negatively associated with firms' just meeting earnings benchmarks.

**Keywords:** real activities manipulation, accrual-based earnings management, trade-off, firm's performance

## المدخل الحقيقي لإدارة الأرباح مقارنة بالمدخل القائم على الاستحقاقات و تأثيره على أداء الشركات المقيدة بالبورصة المصرية

### ملخص البحث

يتناول البحث بصورة عملية اختبار ما اذا كانت الشركات المصرية تستخدم مدخل إدارة الأرباح القائم على هيكله الأنشطة الحقيقية ليحل محل مدخل ادارة الأرباح عن طريق الاستحقاقات، وتأثير ذلك على أداء الشركات المقيدة بالبورصة المصرية خلال الفترة من ٢٠٠٠ إلى ٢٠١٤.

وقد توصل البحث إلى النتائج التالية:

١- تستخدم الشركات المصرية مدخلين لإدارة الأرباح: المدخل القائم على هيكله الأنشطة الحقيقية للشركة و المدخل القائم على الاستحقاقات. ويتم استخدام المدخلين معاً، أي انه لا توجد عملية إحلال بين المدخلين.

٢- لم تتأثر استراتيجيات إدارة الأرباح بالتغيرات في بيئة الأعمال أو الأحداث السياسية. وقد ظهر ذلك واضحاً في عدم قيام مديري الشركات بتغيير منهجيتهم لإدارة الأرباح كرد فعل لتطبيق معايير المحاسبة المصرية في ٢٠٠٧ و ثورة يناير ٢٠١١.

يؤثر المدخل الحقيقي لإدارة الأرباح سلبياً على مؤشرات أداء الشركات المصرية.

## I. Introduction

For decades, the concept of earnings management has been a rich area for research. Accounting literature perceives earnings management (EM) as a purposeful intervention in the external financial reporting process with intent of achieving some private gain. In other words, earnings management is taking deliberate steps within the constraints of GAAP to bring about a desired level of earnings.

Earnings management, according to Healy and Wahlen (1999), occurs when managers use judgment in financial reporting to alter financial reports to either mislead some shareholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting practices.

Accounting literature during the 1990s concentrated on the distinction between efficient and opportunistic earnings management. As argued and empirically demonstrated by many studies (e.g., Guay et al. 1996, Dechow and Skinner 2000, Richardson et al. 2005), efficient earnings management refers to reporting discretion that enables managers to smooth the fluctuations in the timing of cash payments and receipts, thus making earnings more informative to investors than cash flows about firm's fundamental performance. On the other hand, opportunistic earnings management occurs when managers use their discretion to hide poor performance, or exaggerate good performance for job security and compensation reasons.

During the early of the 2000s, the controversy has been shifted to another point, that is, the distinction between accrual earnings management (AEM) and real activities manipulation (REM). Previous studies, (e.g., Nagy and Neal 2001, Schipper 2003, and Ewert and Wagenhofer 2005), argued that accrual earnings management involves choosing accounting methods that help reaching desired levels of earnings through changes in accounting estimates and policies. This may include lowering bad debt expense and/or delaying asset write-offs. Whereas, real activities manipulation entails changes in the timing and structure of real transactions, deviating from optimal plan, to influence earnings levels. This is undertaken through pushing down discretionary expenses such as research and development (R&D), selling and advertising expenses, and/or postponing a new profitable project.

Real activities manipulation was best defined by Roychowdhury (2006) as departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing that certain financial reporting goals have been met in the normal course of operations. Both types of earnings management involve managers' attempts to increase/decrease earnings; however, one type affects operations and the other has no effect on operational activities.

The growing body of real earnings management research emphasizes two related important aspects: costs and timing of real earnings management. Financial executives in Graham et al. (2005) survey admit their willingness to manipulate real activities to meet earnings targets, even though the manipulation potentially reduces firm value,

where actions taken to increase current year's earnings could have an adverse effect on future cash flows. The preference of real activities manipulation over accruals management rests on the premise that ex post aggressive accounting choices with respect to accruals are more likely to attract auditors' scrutiny (Gunny 2010). It is worth emphasizing that relying solely on accruals management entails a risk; where reporting manipulation is a crime for which managers can be sued, but managers can not be blamed for deviations from optimal plan or bad business decisions.

Moreover, accrual manipulations take place at year-end when actual earnings figures fall below targets. On the contrary, real activities should be planned in advance; it can not be manipulated at year-end. Therefore, accrual EM and real EM are fundamentally different as instruments of EM. Accrual EM involves inter-temporal shifting of income, while real EM alters real activity levels that have future performance implications, and in turn, is more serious. Also, accrual EM may be viewed as an ex-post form of EM, while real EM is more anticipatory, taking place over time. Thus, costs and consequences related to accrual and real EM are likely different.

A bulk of studies (e.g., Hamid et al. 2012, Kamel and El-banna 2012, and Augustine et al. 2013) examined accrual-based EM in emerging economies. Despite the increasing interest in and significance of real activities manipulation, only few studies (e.g. Zgarni et al. 2014, Baatour et al. 2016, and Bassiouny et al. 2016) has examined the prevalence of real EM in emerging economies, and its interaction with accrual-based EM. This paper participates in filling this

gap in the literature by examining such interaction, especially around important corporate and political events that occurred in Egypt.

Based on the well-documented prevalence of real EM activities employed to achieve earnings targets, the researcher aims at examining its incidence in Egyptian firms, and whether there exists any substitution or complementary relation with accrual-based strategies. This paper examines such interaction post the introduction of Egyptian Accounting Standards (EAS) in 2007 and the Egyptian Revolution of January 2011 as important corporate and political events. Further, the paper traces the linkage between real EM and Egyptian firms' performance, and whether engaging in real activities manipulation enhances or deters operating performance cited in meeting earnings benchmarks.

In order to reach my objective, I use the modified Jones model (Jones 1991) as described in Dechow et al. (1995) to measure accrual-based EM. Following Roychowdhury (2006), the researcher estimates abnormal levels of operating cash flows, production costs, and discretionary expenses to capture real EM. Moreover, I use Bench firms, that just meet two earnings benchmarks (zero and last year's earnings), to analyze the association between real EM and firms' performance.

The paper provides empirical evidence rejecting the hypothesis of a complete trade-off between accrual-based and real EM, where only a partial substitution has been found. It has been demonstrated that Egyptian firms employ the two types of EM at the same time. Also, results support the idea of the passive effect of corporate and political events on managerial behavior towards EM strategies. Further, engag-

ing in real EM has been found to have an adverse effect on Egyptian firms' performance. In contrast, results suggest that engaging in accrual EM is not opportunistic, but consistent with the firm's better performing in the future or signaling.

The addressed issue is important in a sense that examining only one earnings management technique at a time cannot explain the overall effect of EM activities. On the assumption that accrual-based and real EM mechanisms are used as substitutes, analyzing each type in isolation of the other cannot lead to definitive conclusions. Moreover, the study sheds light on the economic implications of accounting standards. Standards setting context is moving towards more principles-based accounting standards which emphasize limiting accounting alternatives and enhance professional judgment. Regulators should perceive real EM as a potential consequence of such a shift, where it has been demonstrated that real EM increases when tightening accounting standards make accrual-based EM more difficult (Ewert and Wagenhofer 2005).

The paper contributes to the literature on earnings management through providing evidence from Egypt as one of the emerging economies. It complements previous research on the interaction between accrual and real EM, and its effect on firms' performance. Despite the availability of several studies documenting whether real EM occurs in various contexts, the existing literature provides little evidence of the effect of such practice on performance of firms operating in emerging economies, especially Egypt.

The remainder of the paper is organized as follows: Section II presents literature review and hypotheses development. Section III describes the sample and research design. I present empirical results in Section IV. A summary of the findings and concluding remarks appears in Section V.

## **II. Literature Review And Hypotheses Development**

### **Evidence on real activities manipulation:**

Despite the fact that accrual-based earnings management was intensively examined by accounting researchers for more than two decades, the prevalence of real earnings management was not well established until recently. The inspiring findings of Graham et al. (2005) survey motivated many studies to examine real earnings management and its relation and effect on various aspects. The study surveyed more than 400 executives, 80% of them stated that they would cut expenditures on R&D, advertising and maintenance to meet an earnings target, 55% declared their tendency to postpone or give up positive net present value (NPV) projects in order to meet short-term earnings benchmarks, even if such actions would have a negative impact on firm value.

Roychowdhury (2006) is a leading study which developed empirical models to detect real activities manipulation. The study concentrates on variables that capture the effect of real operations better than accruals; namely, cash flow from operations, production costs, and discretionary expenses. Evidence verifies that, in order to avoid losses, firms increase sales by offering price discounts, lower cost of goods sold by engaging in overproduction, and improve margins

through reducing discretionary expenses.

In line with the previous study, Cohen et al. (2008) investigate the incidence of both accrual-based and real earnings management in the pre- and post-Sarbanes Oxley (SOX) periods in order to trace whether the passage of SOX resulted in a reduction in earnings management. The evidence supports the hypothesis that pre-SOX period witnessed an increasing accrual-based earnings management but declining real earnings management. After the passage of SOX, accrual-based earnings management declined significantly, while real earnings management increased significantly. These findings confirm results reached by Graham et al. (2005), suggesting that firms switched to structuring real activities instead of accrual-based earnings management. It is argued that real activities manipulation, while being more costly, is harder to detect.

Focusing on the consequences of real activities manipulation, Gunny (2010) examines its impact on firm performance. The results support the hypothesis that engaging in real earnings management is not opportunistic, where it allows attaining current period benefits and achieving better future performance. This conclusion is based on the findings that real earnings management is positively associated with firms just meet earnings benchmarks. Further, firms engaging in real earnings management to just meet earnings benchmarks have relatively better subsequent performance than firms that do not engage in real earnings management and miss or just meet the benchmarks.

Combining the two streams of research, Cohen and Zarowin (2010) examine the trade-off between real versus accrual methods of

earnings management around seasoned equity offerings (SEOs). It has been found that firms use real, as well as accrual-based, earnings management around SEOs. Further, consistent with the expectation that SOX has made accrual-based earnings management more costly, it's found that firms substituted accrual by real EM after SOX. Also, such tendency for firms to trade-off real versus accrual-based EM activities around SEOs varies cross-sectionally. The firms' choices vary as a function of the firm's ability to use accrual EM and the costs to do so.

Relatedly, but in a different context, Chen et al. (2010) examines the extent to which accrual and real EM differ in their impact on future operating performance and how the market rewards firms for meeting or beating analysts' forecasts. Evidence confirms that firms meeting analysts' expectations using real EM and firms doing so without EM have significantly better future performance than firms missing expectations. It is found that firms using real EM exclusively to meet analysts' expectations outperform firms using accrual EM in the longer term and perform no worse than firms without EM. This suggests a positive signaling role for real EM concerning future operating performance. These results reinforce the findings in Gunny (2010) that real EM might well serve as a signaling mechanism.

Zhang (2008) investigates whether firms have incentives to opportunistically manipulate real activities to meet analysts' cash flow forecasts and the economic consequences of such manipulation. In line with prior studies' findings, evidence verifies that firms just meet cash flow forecasts engage in higher real activities manipulation to inflate cash flows, as compared to other firms with cash flow forecasts.

Moreover, current real EM adversely affects firms' future operating performance.

Exploring the substitution effect of accrual and real EM, Zang (2012) analyzes the implication for managers' trade-off decisions due to the different costs and timing of the two EM strategies. First, because both are costly activities, firms trade-off real activities manipulation versus accrual-based EM based on their relative costliness. That is, when one activity is relatively more costly, firms engage in more of the other. Because firms face different costs and constraints for the two EM approaches, they show different abilities to use the two strategies. Second, real activities manipulation must occur during the fiscal year and is realized by the fiscal year end after which managers still have the chance to adjust the level of accrual-based EM. This timing difference implies that managers would adjust accrual EM based on the outcome of real EM. Hence, there is a direct substitutive relation between the two: if real activities manipulation turns out to be unexpectedly high, managers will decrease accrual EM and vice versa. Empirical evidence confirms the premise that managers use real and accrual EM as substitutes.

### **Types of real activities manipulation**

Prior studies (e.g., Roychowdhury 2006, Cohen et al. 2008, and Cohen and Zarowin 2010) emphasize three main real activities manipulated to boost current cash flows and, in turn, earnings. The point is that these activities are possibly optimal actions in certain circumstances. However, if managers engage in these activities more extensively than normal, with the objective of meeting or beating an earn-

ings benchmark, this would be considered as real EM. These activities are: sales manipulation, overproduction, and reduction of discretionary expenditures.

**Sales manipulation** refers to the behavior of managers trying to increase sales during the current year in order to increase reported earnings. This can be reached through either cutting prices and/or extending more relaxed credit terms. Through offering limited-time price discounts, managers can generate additional sales or accelerate sales from the next fiscal year into the current year. However, the increased sales are likely to vanish when the firm re-set old prices. Moreover, the cash inflow per sale, net of discounts, from these additional sales will be lower as margins decline. Total earnings in the current period are higher as the additional sales are recorded, assuming positive margins. The lower margins due to the price discounts causes production costs, relative to sales, to be abnormally high.

Another way to boost sales volumes temporarily to increase earnings is to offer more relaxed credit terms. These are essentially price discounts and lead to lower cash inflow, as long as suppliers to the firm do not offer matching discounts on firm inputs.

**Overproduction** refers to producing more units than necessary in order to push earnings upwards through lowering cost of goods sold (COGS). Higher production levels are associated with lower fixed costs per unit, where fixed overhead costs are spread over more output units. Lowering costs and building up inventory would cause COGS to be lower, pushing up earnings. However, production and holding costs of extra units produced are not recovered in the same period

through sales. Therefore, operating cash flows are lower than normal given sales levels.

**Discretionary expenses** refer to the sum of: advertising expenses, Research and development expenses, and selling, general and administrative expenses. Firms can reduce reported expenses, and increase earnings through cutting down discretionary expenses. Because of the uncertainty of future benefits associated with investment in R&D, most of these expenditures must be charged to expense as incurred. Thus, managers interested in boosting current period earnings would choose to cut investment in R&D, particularly if the associated benefit would be realized in the future rather than in current period. Also, selling, general and administrative expenses are subject to management discretion. Reducing expenditures, such as employee training, assets maintenance, and travel expenses, enables managers to increase current cash flows, even if this would lower firm value on the long run.

## **Hypotheses Development**

Based on the divergence in nature and costs of accrual EM and real EM, prior studies have provided evidence suggesting that firms make choices between the two EM strategies (Cohen et al. 2008; Cohen and Zarowin 2010; Badertscher 2011; and Zang 2012). Because both are costly activities, firms trade-off real EM versus accrual EM based on their relative costliness. That is, when one activity is relatively more costly, firms use the other more extensively to reach its goal. Further, given the fact that real activities manipulation occur

during the fiscal year, while accrual EM takes place at year end, managers would adjust accrual EM based on the outcome of real EM. Thus, there is a direct substitution relation between accrual and real EM.

**Therefore, the first hypothesis can be developed as follows:**

**H1:** The level of accrual-based EM is negatively related to the level of real activities manipulation.

Our study period is extended from 2000 through 2014. This period evidenced two important events: first, the mandatory application of Egyptian Accounting Standards as of January 2007, and second, the revolution of January 2011.

The Ministerial Decree 503/1997 was the first to introduce EAS to be implemented in fiscal years starting January 1998. Ministerial Decree 503/1997 mandates the use of IAS in the absence of EAS, but actual accounting practice lagged behind due to inadequate practitioner knowledge of current IASC/IASB pronouncements and lack of appropriate implementation guidelines (World Bank 2002).

By 2002, the IAS expanded enormously covering business areas previously not regulated. So, EAS need to be updated. Minister of Economy issued the Ministerial Decree 345/2002 to update the EAS; specifically twenty-two standards replace the old version of EAS issued in 1997. In 2004, IAS, besides being renamed IFRS, were subject to many changes. Minister of Investment issued the Ministerial Decree 243/2006 to replace the 1997 and 2002 decrees and mandated the application of an updated set of thirty-five EAS.

The EAS are mainly translation of principles-based IAS with limited accounting alternatives. It is questionable whether tightening accounting standards could reduce earnings management and provide more relevant information. As noted by several authors, (e.g., Schipper 2003, and Ewert and Wagenhofer 2005), tighter accounting standards may lead to a substitution effect where the reduction in accounting earnings management is met with increased real earnings management.

**The second hypothesis can be developed as follows:**

**H2:** The introduction of the new set of EAS in 2007 decreased the level of accrual-based EM.

It is well established that accounting is a service function affected by socio-economic and political events. Culture has been shown to be a major factor affecting the structure of business and accounting. The Egyptian revolution of January 2011 created a culture of uncertainty and instability in the business and investment environment. It caused the deterioration of Egyptian economic indices and severe declines and losses in the Egyptian Stock Exchange. Foreign investment in Egypt deteriorated post revolution from 6.8 to only 2 billion dollars for the fiscal year 2010/2011. The main indices of Egypt Stock exchange (EGX 30 and EGX 100) dropped by 10.5% and 14% respectively after revolution (Salman and Zaazou 2013). Moreover, the trade balance reported a deficit exceeding 28 billion dollars in 2011, and the foreign direct investment fall from more than 113 billion to less than 2 billion dollars (Central Bank of Egypt Annual Report, 2011). The significant decrease in private investment, domestic and foreign, was at-

tributed to the lack of stability and internal security. Based on the premise that accrual-based EM is more likely to attract auditors' scrutiny implying more risk, it is predicted that the Egyptian Revolution of 2011 would alter managerial behavior with respect to strategies employed to manage earnings.

**Our third hypothesis can be developed as follows:**

**H3:** The level of accrual-based EM decreased post January 2011 revolution.

The accounting literature offers an abundance of evidence that firms use accrual EM to achieve earnings targets. A growing body of literature also documents the use of real activities manipulation for reasons such as avoiding losses or meet/beat earnings benchmarks. Whether real EM signals positive or negative future performance is still ambiguous, where prior studies (e.g. Gunny 2010 and Cohen and Zarowin 2010) reached mixed results concerning the association between future operating performance and real EM.

To the extent that real EM represents a deviation from optimal levels of real activity to attain short-term earnings goals, it should convey negative long-term consequences about future operating performance. This hypothesis was tested by Cohen and Zarowin (2010), where they found a decline in operating performance following seasoned equity offerings for firms with real EM. Also, Zang (2012) finds that a high level of real EM is a leading indicator of adverse future performance.

On the other hand, studies such as Gunny (2010) and Chen et al. (2010) reach evidence consistent with the hypothesis suggesting that

real EM is a credible signaling mechanism reflecting positive future performance. Firms engaging in real EM to avoid losses or earnings declines realize higher future performance compared to firms that miss these earnings benchmarks and firms that achieve these targets without engaging in real EM.

**Our fourth hypothesis can be developed as follows:**

**H4:** Firms' operating performance measures are positively associated with the level of real EM.

### **III. Research Design**

This section presents data and sample selection, along with the empirical models employed.

#### **Data and Sample Selection**

The initial study sample consists of the most active firms listed on the Egyptian Stock Exchange during the period of 2000-2014.

**The following criteria are used in the selection of the final sample:**

- 1- The firm must have been continuously listed on the Egyptian Stock Exchange during the study period.
- 2- Firms in the financial industry and utility industry are excluded because they operate in highly regulated industries with accounting rules that differ from other industries.
- 3- Each firm-year observation is required to have the data necessary to calculate the discretionary accruals metrics and real EM proxies employed in the analysis.

These requirements likely introduce a survivorship bias into the sample resulting in the inclusion of larger and more successful firms. It is expected that this will reduce the variation in EM met-

rics resulting in a more conservative test of research questions. The exclusion of firms that did not meet the previous criteria ended up with a final sample of 30 firms, all belong to manufacturing sector except for two firms, representing 450 firm-year observation.

Study Period was chosen to extend from 2000 through 2014.

**This period is considered critical because of the following reasons:**

First, the period from 2000 to 2010 has evidenced a steady growth and stability in the Egyptian markets and flourishing of Egyptian Stock Exchange. This is evident in the obvious increase in the trading volume, number of trading securities, number of investors and number of brokerage firms (Disclosure Books of Egyptian Stock Exchange 2008 & 2010). Second, the observations are recent enough to be relevant to the present and the future. Third, January 2007 is the effective date for the new set of Egyptian Accounting Standards issued by the Ministerial Decree No. 243 for the year 2006, to replace the predecessor Egyptian Accounting Standards issued in 1997 and its modifications in 2002. Finally, the period from 2011 to 2014 has evidenced major political changes that affect the Egyptian Stock Exchange and Egyptian economic indices.

I use the annual disclosure books issued by the Egyptian Stock Exchange to trace the most active firms whose stocks are traded on a regular basis. Annual financial statements and market capitalization are obtained from Egypt for Information Dissemination "Egid"

## Empirical Models

### Accrual-based Earnings Management (AEM):

The researcher uses a cross-sectional model of discretionary accruals, where for each year, I estimate the model for every firm. This controls for variations in business and operating conditions across firms that affect total accruals, while allowing the coefficients to vary across time.

The employed model to estimate abnormal accruals is the modified Jones model (Dechow et al. 2003):

$$\frac{TACC_{it}}{TA_{it-1}} = K_0 + K_1 \frac{1}{TA_{it-1}} + K_2 \frac{\Delta Rev_{it}}{TA_{it-1}} + K_3 \frac{PPE_{it}}{TA_{it-1}} + \epsilon_{it} \text{-----(1)}$$

Where, for fiscal year t and firm i, TACC represents total accruals defined as:

$TACC_{it} = EBXI_{it} - CFO_{it}$ , where, EBXI is the earnings before extraordinary items and discontinued operations and CFO is the operating cash flows.

$\Delta Rev_{it}$  is the change in sales revenues for the current year,  $PPE_{it}$  is the gross value of property, plant and equipment. All variables are deflated by lagged total assets

$TA_{it-1}$ . Residuals from equation (1),  $\epsilon_{it}$ , serve as our measure of abnormal accruals for each firm-year in our sample; **AEM**.

An alternative approach is to divide the study period into two sub-periods: estimation and examination period, with implementing the model on two stages: first, use the model to calculate the coefficient estimates during the estimation period, and second, use these parameters to estimate the firm-specific normal accruals during the examina-

tion period. The measure of discretionary accruals is the difference between total accruals and fitted normal accruals.

However, this alternative has been discarded where splitting our study period into two periods would not produce reliable results, because of the major political events that hit the Egyptian economy during the period of 2011-2014 affecting business environment and economic indices.

### **Real Earnings Management (REM):**

We rely on the leading model of Roychowdhury (2006) to develop proxies for real EM. Subsequent studies, such as Cohen et al (2008), Cohen and Zarowin (2010), Gunny (2010), and Zang (2012), provide evidence of the validity of such proxies. Our employed model considers three metrics: the abnormal levels of operating cash flow, production costs, and discretionary expenses, to examine the level of real activities manipulation.

It is notable that firms managing earnings upwards are likely to have one or all of these: (1) unusually low CFO, (2) unusually high production costs, and/or (3) unusually low discretionary expenses.

1-Sales manipulation model: Through increased price discounts and more lenient credit terms, a firm can temporarily increase sales volume boosting current earnings, assuming positive margins. However, increasing price discounts and lengthening operating cycle would push down operating cash flows in the current period. Normal levels of operating cash flows are expressed as a linear function of sales revenues and changes in sales revenues (DKW 1998). To

estimate this model, we run the following cross-sectional regression for each firm and year:

$$\frac{\text{CFO}_{it}}{\text{TA}_{it-1}} = K_0 + K_1 \frac{1}{\text{TA}_{it-1}} + K_2 \frac{\text{Rev}_{it}}{\text{TA}_{it-1}} + K_3 \frac{\Delta\text{Rev}_{it}}{\text{TA}_{it-1}} + \hat{\omega}_{it} \text{----}(2)$$

Where  $\text{CFO}_{it}$  is the normal level of operating cash flows scaled by lagged total assets  $\text{TA}_{it-1}$ . The deviation from such normal level will capture abnormal cash flows from operations. That is, the residuals  $\hat{\omega}_{it}$  in equation (2) will be used as the proxy for abnormal cash flow; **R\_CFO**.

2- Production costs: producing more units would lower fixed costs per unit. This would result in decreasing total cost per unit, if it is not offset by any increase in marginal cost per unit. On the one hand, COGS would be decreased and the firm can earn higher margins. On the other hand, the firm will incur additional production and holding costs that will, in turn lower operating cash flows given sales levels.

Normal levels of production are expressed as a linear function of sales revenues, changes in sales revenues, and lagged change in sales. To estimate this model, we run the following cross-sectional regression for each firm and year:

$$\frac{\text{Prod}_{it}}{\text{TA}_{it-1}} = K_0 + K_1 \frac{1}{\text{TA}_{it-1}} + K_2 \frac{\text{Rev}_{it}}{\text{TA}_{it-1}} + K_3 \frac{\Delta\text{Rev}_{it}}{\text{TA}_{it-1}} + K_4 \frac{\Delta\text{Rev}_{it-1}}{\text{TA}_{it-1}} + \hat{\omega}_{it} \text{----}(3)$$

Where  $\text{Prod}_{it}$  is the normal level of production scaled by lagged total assets  $\text{TA}_{it-1}$ . The residuals  $\hat{\omega}_{it}$  in equation (3) will be used as the proxy for abnormal production; **R\_prod**.

3- Discretionary expenses: cutting down expenditures on advertising, research and development, selling, general and administrative expenses would increase current period earnings. Current operating cash flows are enhanced at the expense of future cash flows.

Normal levels of discretionary expenses are expressed as a linear function of lagged sales revenues. To estimate this model, we run the following cross-sectional regression for each firm and year:

$\frac{\text{Disc exp}_{it}}{\text{TA}_{it-1}} = K_0 + K_1 \frac{1}{\text{TA}_{it-1}} + K_2 \frac{\text{Rev}_{it-1}}{\text{TA}_{it-1}} + \lambda_{it} \text{-----(4)}$
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Where  $\text{Disc exp}_{it}$  is the normal level of discretionary expenses scaled by lagged total assets  $\text{TA}_{it-1}$ . The residuals  $\lambda_{it}$  in equation (3) will be used as the proxy for abnormal discretionary expenses; **R\_Disx**.

Similar to Cohen et al (2008) and Cohen and Zarowin (2010), we use the above three proxies to capture the effect of real activities manipulation. We sum up the three residuals into a combined measure **RM\_proxy**. In order to standardize the effect of these variables,  $R\_CFO$  and  $R\_Disx$  are multiplied by (-1), where higher values denote firms' higher involvement in sales and discretionary expenses manipulation.  $R\_prod$  will not be multiplied by (-1), since higher production costs indicates overproduction to lower COGS.

**Firms' operating performance:**

Our fourth hypothesis examines the relation between firms' engaging in real EM and their operating performance. It is suggested that

managers may use the joint signal, engaging in real EM and just meeting the earnings benchmark, to convey future growth prospects.

Following Gunny (2010), we split firm-years into groups based on incentives to engage in real EM. It is highly argued that firms engage in real EM either to avoid losses (meet-zero), or to beat last year's earnings (meet-last). Firms that just meet zero earnings are identified as having net income, scaled by lagged total assets, that is greater than or equal to zero, but less than 0.01. Firms that just meet last year's earnings are identified as having change in net income, scaled by lagged total assets, that is greater than or equal to zero, but less than 0.01.

These are our "suspect" firms, that is, firms that are suspected to engage in EM to just meet zero earnings or last year's earnings.

The following equation is estimated to test for the association between firms just meeting benchmarks and real EM. The equation will use four measures of real EM as the dependent variable: R\_CFO, R\_prod, R\_Disx, and RM\_proxy:

$$\mathbf{RM}_t = \gamma_0 + \gamma_1 \mathbf{Bench}_t + \gamma_2 \mathbf{Size}_t + \gamma_3 \mathbf{MTB}_t + \gamma_4 \mathbf{ROA}_t + \varepsilon_t \text{ ----}$$

(5)

**Where:**

Bench is an indicator variable that is equal to one if (1) net income scaled by lagged total assets is between 0 and 0.01, or (2) the change in net income scaled by lagged total assets is between 0 and 0.01, or zero otherwise.

Size is the natural logarithm of total assets.

MTB is the market value of equity divided by book value of equity.

ROA is the net income before extraordinary items divided by lagged total assets.

It is notable that size and MTB are controls variables that are included to neutralize the size effects and growth opportunities. ROA addresses the correlation between RM and performance.

#### IV. Results

This section presents the results of the previously illustrated empirical models.

##### Accrual-based and Real EM proxies:

Empirical model equations (1) through (4) provide an explanatory analysis of accrual-based EM and real EM. Table 1 presents descriptive statistics for the models' Residuals.

**Table (1)**  
**Descriptive Statistics for AEM and REM proxies**  
**for years 2000 through 2014**

	Minimum	Maximum	Mean	Median	Std Dev	25 <sup>th</sup> Per-centile	75 <sup>th</sup> Per-centile
<b>AEM</b>	-0.82441	6.10013	0.00000	-0.025	0.33432376	-0.075	0.023
<b>R_CFO</b>	-6.09965	0.81135	0.00000	0.0059	0.32601972	-0.080	0.063
<b>R_Prod</b>	-3.01916	3.14389	0.00000	0.0059	0.2998939	-0.081	0.0628
<b>R_Disx</b>	-0.14851	0.24602	0.00000	-0.0176	0.04860623	-0.031	0.021
<b>R_Proxy</b>	-2.81	6.02	0.0006	0.0139	0.47573	-0.0146	0.135

Table 1 illustrates the minimum, maximum, mean and standard deviation for the residuals of equations (1) through (4), denoting accrual-based earnings management AEM and real EM presented by sales

manipulation, R\_CFO, production manipulation, R\_prod, discretionary expenses manipulation, R\_Disx, and the aggregate measure for real EM, R\_Proxy.

The results show that the mean of the four residuals is equal zero. The largest minimum value belongs to R\_prod, while the largest maximum value belongs to AEM. R\_Disx shows the lowest standard deviation due to the low difference between its minimum and maximum value. The first three residuals, AEM, R\_CFO, and R\_prod, show approximately the same range and, in turn, almost the same standard deviation. Moreover, the negative AEM are, on average, greater in magnitude than positive AEM, where the 25<sup>th</sup> percentile is equal (-0.075) and the 75<sup>th</sup> percentile is (0.023). This is also true the three real EM proxies, R\_CFO, R\_prod, and R\_Disx.

**Table (2) Model Parameters**

	<b>TACC/TAt-1</b>	<b>CFO/TAt-1</b>	<b>Prod/TAt-1</b>	<b>Disx/TAt-1</b>
<b>Intercept</b>	0.039* (1.35)	0.091** (3.949)	-0.078** (-3.647)	0.035** (10.538)
<b>1/TAit-1</b>	4212762.18** (3.159)	-4517377.58** (-3.080)	5991717.522** (4.361)	-22557.136 (-0.105)
<b>Rev it / TA it-1</b>		0.054** (2.095)	0.853** 35.223	
<b>Rev it-1 / TA it-1</b>				0.027** (6.797)
<b>ΔRev it /TA it-1</b>	0.361 (0.044)	-3.740 (-0.464)	5.485 (0.739)	
<b>ΔRevit- 1/TA t-1</b>			-4682610.851* (-1.886)	
<b>PPE it / TA it-1</b>	-0.072* (-1.632)			
<b>Adjusted R<sup>2</sup></b>	18%	26%	81%	22%
<b>P-value</b>	0.013	0.018	0.000	0.000

\*Significant at 10% level

\*\*Significant at 5% level

Table 2 reports the regression coefficients for the empirical models equations from (1) through (4), along with their t-values (between brackets), used to estimate AEM and real EM proxies. These models are estimated using the entire sample of 450 firm-years. The table reports the mean coefficients across firm-years and t-statistics across firm-years.

The four models are statistically significant as shown by their low P-values (< 5%). However, the values of adjusted R<sup>2</sup> reflect a relatively low explanatory power of the models, except for production costs (81%).

**Table (3) Correlation Matrix among EM Proxies**

	<b>AEM</b>	<b>R_CFO</b>	<b>R_Prod</b>	<b>R_Disx</b>
<b>AEM</b>	1	-0.844**	0.007	0.127
<b>R_CFO</b>	-0.548**	1	-0.146**	-0.142**
<b>R_Prod</b>	0.214**	-0.533**	1	-0.123**
<b>R_Disx</b>	0.028	-0.068	-0.198**	1

\*\*Significant at 1% level

Table 3 reports the correlations between various proxies of EM. Both Pearson (above the diagonal) and Spearman coefficients (below the diagonal) are reported for sample firms over 2000-2014.

The correlation between AEM and R\_CFO is significantly negative (-0.844 Pearson and -0.548 Spearman). This implies that firms use accrual-based EM and cash flow manipulation as substitutes. The spearman's correlation coefficient between AEM and R\_prod is significantly positive (0.214) implying that firm engage in both discretionary accruals and overproduction to manage earnings. The correlation coefficients between AEM and R\_Disx are insignificantly positive (0.127

Pearson and 0.028 Spearman), denoting that firms use accruals and discretionary expenses at the same time to influence earnings upwards. Correlations among REM proxies reveal that coefficients between R\_CFO and R\_prod are significantly negative (-0.146 Pearson and -0.533 Spearman). This indicates that firms substitute sales manipulation by implementing activities that lead to abnormally high production costs. This is also true for the correlations between R\_CFO and R\_Disx (-0.142), and between R\_prod and R\_Disx (-0.198). This indicates that firms select among different real EM tools.

The overall results indicate a partial substitution relation between AEM and REM. This entails the rejection of the first hypothesis that predicted a negative relationship between AEM and REM.

### **Egyptian Accounting Standards 2007:**

In order to examine the effect of the introduction of EAS in (2007) on AEM and REM metrics, the researcher sub-divide the study period into two periods: prior to 2007 and after 2007.

**Table (4) Egyptian Accounting Standards 2007 and AEM / REM Proxies**

	<b>Prior to 2007 (2000-2006)</b>	<b>After 2007 (2007-2014)</b>	<b>Differences</b>
<b>AEM</b>	0.00886 (1.432)	-0.0212 (0.157)	0.03003 (0.154)
<b>R_CFO</b>	0.009898 (0.485)	0.00026 (0.668)	0.0096347 (0.628)
<b>R_Prod</b>	-0.01968 (-0.665)	0.0111 (-0.017)	-0.03079 (0.507)
<b>R_Disx</b>	0.0093374 (-0.466)	0.01279 (-0.025)	-0.00345 (0.642)
<b>R_Proxy</b>	-0.0383 (-0.656)	-0.0015 (-0.279)	-0.03672 (0.512)

Table 4 illustrates that none of the mean differences are statistically significant. This indicates that there is no change in managerial behavior with respect to EM strategies before and after 2007. The result implies that the introduction of the new set of EAS has no effect on firms' attitude towards EM. Actually, this is not surprising since the Egyptian business environment is lacking for legal provisions about the civil or criminal liabilities of parties responsible for supplying misleading or incorrect information in audited financial statements. Although there are some legal provisions that mention the liabilities of directors and auditors, these seem to be unclear and, in practice, the accountants and auditors do not face any real liability in case of violating the legally established accounting and auditing standards. Egyptian accountants and auditors were never sued for their professional misconduct. Egypt's World Bank Report on the Observance of Standards and Codes (ROSC 2002) finds that disclosure requirements and audit report format are not followed by many listed companies and their auditors, and that penalizing actions against violators are weak or non-existent.

These findings are consistent with El-bannan (2010) results that provide insignificant evidence that earnings management decreases post adoption of each of the EAS versions under investigation. The study attributed the results to the weakness in the infrastructure of the accounting profession as well as lack of serious enforcement measures by regulatory agencies.

The results suggest the rejection of the second hypothesis which predicted a decrease in the level of AEM after the introduction of EAS.

### **Egyptian Revolution of 2011:**

In order to examine the effect of the Egyptian Revolution of (2011) on AEM and REM metrics, the researcher sub-divide the study period into two periods: prior to 2011 and after 2011.

**Table (5) January Revolution 2011 and AEM / REM Proxies**

	<b>Prior to 2011 (2000-2010)</b>	<b>After 2011 (2011-2014)</b>	<b>Differences</b>
<b>AEM</b>	0.00758 (0.794)	-0.021172 (1.189)	0.02875 (0.235)
<b>R_CFO</b>	-0.0000944 (-0.010)	0.0002636 (-0.015)	-0.00035798 (0.988)
<b>R_Prod</b>	-0.0039771 (-0.464)	0.0111084 (-0.344)	-0.01508553 (0.643)
<b>R_Disx</b>	-0.0046505 (-3.405)	0.0127890 (-2.876)	-0.01743948 (0.001)
<b>R_Proxy</b>	0.0014 (0.057)	-0.0015 (0.055)	0.00293 (0.956)

Table 5 shows that the mean differences pre and post 2011 are not statistically significant. Firms exhibit negative AEM and positive real EM proxies after 2011, still the average magnitude and the change in mean differences are statistically insignificant. This indicates that managers have no tendency to change their EM strategies, even under conditions of uncertainty and instability in the business and investment environment.

The question is how such a major political event, that caused severe losses, would have any effect on differential managerial reporting practices. The result sheds the light on the gap between economic and

political events, that deeply affect Egyptian Stock Market indices, and reporting practices.

The results suggest the rejection of the third hypothesis which predicted a decrease in the level of AEM after January revolution of 2011.

### Firm performance:

In order to examine the association between firms' performance and REM metrics, the researcher regress each of the REM proxies on performance indicators.

**Table (6) Regression relating REM proxies for firms just meeting zero or last year's earnings**

	<b>R_CFO</b>	<b>R_prod</b>	<b>R_Disx</b>	<b>R_Proxy</b>
<b>Intercept</b>	-0.147 (-0.708)	-0.202 (-1.063)	0.106** (3.552)	-0.154 (-0.514)
<b>Bench</b>	-0.015 (-0.483)	-0.028 (-0.945)	0.001 (0.238)	-0.13 (-0.29)
<b>Size</b>	0.006 (0.612)	0.012* (1.275)	-0.005** (-3.575)	0.011 (0.717)
<b>MTB</b>	0.00022 (0.569)	-0.00022 (-0.629)	0.000009* (1.752)	-0.00054 (-0.978)
<b>ROA</b>	0.228** (3.088)	-0.184** (-2.719)	-0.006 (-0.567)	-0.405** (-3.792)
<b>Adjusted R<sup>2</sup></b>	1.4%	1.5%	2.5%	2.8%
<b>P-value</b>	0.036	0.032	0.004	0.003

\*Significant at 10% level

\*\*Significant at 5% level

Table 6 reports the results of the estimation of Equation (5). It is notable that the three individual variables underlying R\_Proxy have different implication for earnings which may dilute any results using R\_Proxy alone. Thus, I report results corresponding to the single real

EM proxy (R\_Proxy) as well as the three individual real EM proxies (R\_CFO, R\_prod, and R\_Disx).

Empirical results support the significance of the model in examining the impact of real EM proxies on meeting earnings benchmarks. This can be cited in low P-values.

Real EM from sales manipulation, R\_CFO, is negatively associated with firms just meet zero or last year's earnings (-0.015). Real EM from overproduction, R\_prod, is also negatively associated with firms just meet zero or last year's earnings (-0.028). The coefficient on Bench when R\_Disx is the independent variable is not significantly different from zero. It implies that firms achieving earnings targets do not engage in discretionary expenses reduction as a tool of real EM.

Since firms might engage in more than one type of real EM simultaneously, R\_Proxy aggregates the real EM metrics into one measure. The last column in table 6 shows the results from the estimation equation (5) using R\_Proxy as the independent variable. The coefficient on Bench is -0.13, indicating that firms engaging in real EM fail to achieve earnings benchmarks represented in either avoiding losses or meeting last year's earnings.

Further analysis, employing AEM as the independent variable, produces a significant positive coefficient on Bench (0.03). This indicates that firms efficiently use discretionary accruals to meet earnings targets.

Overall, it appears that engaging in real EM has an adverse effect on firms' performance, where it restricts managers' ability to meet their desired earnings targets.

**Table (7) Correlation Matrix among REM Proxies and firm performance indicators**

	Size	MTB	ROA	R_CFO	R_prod	R_Disx
Size	1	0.026	-0.033	0.023	0.060	-0.164
MTB	0.137**	1	0.039	0.032	-0.036	0.077
ROA	0.070	0.430**	1	0.146**	-	-0.017
R_CFO	-0.075	0.175**	0.537**	1	-	-
R_prod	0.203**	-	-	-	1	-
R_Disx	-	0.125**	-0.006	-0.068	-	1
	0.276**				0.198**	

Table 7 reports Pearson (above the diagonal) and Spearman correlation coefficients (below the diagonal) between RM proxies and firm characteristics for sample firms over 2000-2014. The correlation matrix reveals that cash flow manipulation, R\_CFO, shows a negative insignificant Spearman correlation with size (-0.075). The Pearson positive insignificant correlation coefficient (0.023) is undermined because of the influence of outliers. R\_CFO is positively and significantly correlated with both market to book value of equity (0.175) and return on assets (0.537). Residuals from overproduction, R\_prod, appear to be positively and significantly correlated with size (0.06 Pearson and 0.203 Spearman). R\_prod shows a negative significant correlation with both MTB (-0.178) and ROA (-0.406).

Discretionary expenses manipulation, R\_Disx, exhibits negative correlation with size (-0.276) and ROA (-0.006), and positive significant correlation with MTB (0.125).

The overall results suggest the rejection of the fourth hypothesis that predicted a positive association between firms' performance measures and REM proxies.

## **V. Summary and Conclusion**

The study provided evidence from Egypt, as an emerging economy, for the existence of real activities manipulation and how firms trade-off accrual-based and real EM over the period 2000-2014. Also, the paper examined the effect of the introduction of Egyptian accounting standards 2007 and Egyptian January Revolution 2011 on such trade-off. Further, the paper investigated the effect of real EM on operating performance of firms in the Egyptian Stock Market.

I used the residuals of modified Jones model (1991) to capture accruals-based EM. For real EM proxies, the paper employed the residuals of Roychowdhury (2006) models to estimate abnormal levels of operating cash flows, production costs, and discretionary expenses. Moreover, I combined these three measures into a comprehensive aggregate measure of real EM.

The study's first hypothesis predicted a substitution effect of accrual-based EM for real EM. Empirical evidence suggested that AEM is negatively related to abnormal levels of operating cash flow, and positively related to abnormal production costs and discretionary expenses. This means that firms relying on accruals-based EM to influence output of accounting system also rely on abnormal higher levels of production costs, in addition to, cutting discretionary expenses such as selling, general, and administrative expenses. The result implied that

firms use both accrual and real EM simultaneously, no complete substitutive relation between the two strategies employed to manage earnings. This result contradicted findings reached by Zang (2012), Cohen et al. (2008), and Cohen and Zarowin (2010). These studies provided evidence that firms substitute accrual-based EM for real EM in response to changing scrutiny environment.

The second and third hypothesis anticipated that the introduction of EAS in 2007 and January Revolution of 2011 would decrease the levels of accrual-based EM, which is perceived to be more subject to auditors' scrutiny. Empirical evidence did not lend credence to such an argument, where it appeared that managers were unwilling to change their managing strategies, even under varying corporate and political events.

The fourth hypothesis proposed that engaging in real EM enhances firms' performance. Empirical evidence from the Egyptian Stock market presented that real EM has an adverse effect on firms' operating performance. The results indicated that after controlling for size, performance, and market-to-book, real EM metrics was negatively associated with firms' just meeting earnings benchmarks. Firms engaged in real EM fail to achieve desired earnings targets presented in avoiding losses or meeting last year's earnings. Moreover, managers have a greater ability to use accrual-based EM strategies to efficiently signal firms' operating performance. It is worth mentioning that such result is consistent with Cohen and Zarowin (2010) and Zang (2012) suggesting that a high level of real EM is associated with adverse future performance. This assertion is contradicted by Gunny (2010) and Chen et

al. (2010) revealing that using real manipulation to influence earnings is not opportunistic, it attains benefits that allow firm to perform better in the future or signaling future performance.

The study contributes to the body of literature through providing confirmation or contradiction of results of previous studies concerning accrual and real EM. It complements previous research on the interaction between accrual and real EM, and its effect on firms' performance. Examining a different environment, Egypt as an emerging country, I provide evidence that contradicts assumptions proven to be well-accepted in developed economies. While confirming the prevalence of real activities manipulation, evidence rejects a complete trade off between accrual-based and real EM. Egyptian firms are found to use both strategies to manage earnings.

In addition, the research contribution is reflected in analyzing the effect of AEM versus REM on performance of firms operating in the Egyptian Stock Market.

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