The Role of Earnings and Its Components in Predicting Future Cash Flows: Evidence from the MENA Region Firms.

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Abstract

This thesis aims to examine the role of current earnings and its components- cash flows and accruals- in predicting the one-year-ahead cash flows from operations (CFO) in the MENA region firms for a sample period 2005-2018. In order to achieve this aim, the thesis considers a variety of cash flow prediction models to identify which model provides superior prediction of the one-year-ahead CFO. This thesis starts with aggregated predictors; i.e., earnings and CFO to identify which of these aggregate predictors provide superior prediction of the one-year-ahead CFO. In addition, this thesis examines whether the disaggregation of earnings, CFO and accruals to their major components enhances their ability to predict the one-year-ahead CFO. To evaluate predictive ability, both in-sample regression analysis and out-of-sample prediction tests are employed. The results of the in-sample regression analysis, especially under the pooled regression analysis, and out-of-sample prediction tests indicate that there is no significant difference between the ability of aggregate earnings and CFO to predict the one-year-ahead CFO. However, results of the in-sample regression show that the full disaggregation model, which includes both the cash flow components and accrual components, provides the best prediction of the one-year-ahead CFO. In contrast, the results of the out-of-sample prediction tests show that disaggregated predictors are unable to outperform the aggregate predictors in predicting the one-year-ahead CFO. Since out-of-sample prediction test is more reliable than in-sample regression, the results imply that disaggregation does not provide superior prediction of the one-year-ahead CFO in the MENA region. Furthermore, this thesis investigates the impact of earnings management (discretionary accruals and real activities manipulation), unintentional managerial errors in estimating accruals, and accounting conservatism on the predictive ability of earnings and its components. The findings show that there is a significant negative relationship between the predictive ability of earnings (and its components) and both earnings management techniques and unintentional managerial errors. The results also show that although there is a weak positive significant relationship between the predictive ability of accruals and unconditional conservatism, there is no relationship between the predictive ability of earnings and both types of conservatism (conditional and unconditional conservatism).

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List of Abbreviations

ACC	Accruals
AIC	Akaike Information Criterion
APB	Accounting Principle Board
BIC	Bayesian Information Criterion
CFO	Cash Flows From Operations
COGS	Cost Of Goods Sold
DM	Direct Method
EARN	Earnings
FAS	Financial Accounting Standards
FASB	Financial Accounting Standards Board
FEM	Fixed Effect Model
FIFO	First-in, First-out
FCFO	Future Cash flows From Operations
GAAP	Generally Accepted Accounting Principles
GCC	Gulf Cooperation Council
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standards
IM	Indirect Method
LIFO	Last-in, First-out
MENA	Middle East and North Africa
PPE	Plant, Property and Equipment
PRM	Pooled Regression Model
R&D	Research and Development
REM	Random Effect Model
VIF	Variance Inflation Factor

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Chapter 1
Introduction

1.1 Introduction

Cash flow prediction has long been recognized as one of the fundamental uses of financial reporting. Thus, it has increasingly attracted both researchers and practitioners over the past several decades. Cash flow prediction is of interest to many external and internal users of accounting information, including security analysts, investors, creditors, managers and even employees (Al-Attar and Hussain, 2004; Lev, Li and Sougiannis, 2010; Francis and Eason, 2012). It is considered a key component in security valuation and more generally in capital budgeting analysis and dividend policy formulation (Barth, Cram and Nelson, 2001; Penman, 2010). Creditors are interested in a firm's future cash flows to assess debtor's solvency and liquidity (Defond and Hung, 2003), and to make lending or debt restructuring decisions (Yoder, 2007). Moreover, employees and prospective employees may be interested in whether the firm can meet its payroll obligations (Yoder, 2007).

Thus, cash flow prediction is one of the main inputs in valuation processes of investment and accounting measurements. However, cash flow prediction has enjoyed only limited interest among market participants until the early nineties. From 1993 and onward, market participants start to focus more on cash flow predictions along with earnings predictions (DeFond and Hung, 2003). They argue that this shift in focus is due to various accounting treatments used to adjust or manipulate earnings, while cash flow is more objective. Therefore, they argue that cash flow prediction may be a good or a better proxy for measuring a firm's underlying value compared to earnings predictions.

The importance of cash flow prediction is also supported by the Conceptual Framework of the Financial Accounting Standards Board (FASB), 1978, and the International Accounting Standards Board (IASB), 1989. According to both boards, the prediction of future cash flows is the primary objective of financial reporting. Consequently, many studies emerged to address the needs of market participants in obtaining accurate predictions of future cash flows. Given the FASB and IASB assertions which state that information about earnings, including both cash flows and accruals, is more powerful in predicting future cash flows than cash flows alone, researchers' initial focus was on whether current earnings (henceforth, $EARN$) has superior ability over current cash flows from operations (henceforth, CFO) alone in predicting the firm's future cash flows from operations (henceforth, $FCFO$).

Although there is an extensive literature on cash flow prediction, the empirical evidence on which model provides the best prediction of the $FCFO$ to date is still highly debatable. Some studies find that current $EARN$ has superior ability compared to the current CFO in predicting the $FCFO$ (Lorek and Willinger, 1996; Dechow, Kothari and Watts, 1998; Kim and Kross, 2005; Ebaid, 2011; Arnedo, Lizarraga and Sánchez, 2012). In contrast, other studies provide evidence that the current CFO is superior predictor of the $FCFO$ compared to $EARN$ (Finger, 1994; Farshadfar, Ng and Brimble, 2008; Lorek and Willinger, 2009; Lev *et al*., 2010; Habib, 2010).

Although the FASB (1978) and the IASB (1989) emphasize the role of accruals-based earnings in helping investors to predict the $FCFO$, the accounting literature and the financial press have raised questions on whether accruals are used to increase earnings quality and make financial reports more informative or they are used for earnings management, In this sense, earnings management is defined as an intentional intervention of management in the financial reporting process to have a private gain (Schipper, 1989). Moreover, Dechow and Dichev (2002) and Francis, LaFond, Olsson and Schipper (2005) argue that intentional earnings management is not the only source of biases in earnings; rather there are unintentional managerial errors in estimating accruals due to the difficulty of predicting an uncertain future event. Thus, if reported $EARN$ is distorted by measurement bias, either intentionally or unintentionally, its informativeness, and then its predictive ability may be impaired to a point where it no longer provides incremental prediction value or even lower predictive ability compared to those based on the current CFO.

In contrast, accounting conservatism is used to control the managers' intention to overstate earnings or assets and understate liabilities. Empirical evidence in the US reflects that managers became more conservative in their financial reporting since the late 20th century (Givoly and Hayn, 2000). They attribute the increased level of accounting conservatism to the application of many FASB announcements that require early recognition of expenses and expected future losses in earnings, and the deferral of revenues and gains until they are verified. This is deemed as a probable cause for the increasing ability of current $EARN$ more than the CFO to predict the $FCFO$ in the US context (Kim and Kross, 2005).

In conclusion, predictions of future cash flows play an important role in many financial and investment decisions; such as valuation of firm's securities, investment analysis (Krishnan and Largay, 2000; Nam, Brochet and Ronen, 2012), and accounting standard-setters state that predicting future cash flows is one of the prime objectives of financial reporting. Therefore, any investigation to identify models that improve predicting future cash flows should be of interest to preparers, users, investors and regulators of financial reporting. Thus, this research aims to fill the research gap and extend the literature by examining the ability of $EARN$ and its components, CFO and accruals (henceforth, ACC), in predicting the one-year-ahead CFO in the MENA region firms. Furthermore, this thesis aims to shed light on the extent to which the predictive ability of $EARN$ and its components is influenced by earnings management, unintentional managerial errors, and accounting conservatism. The uniqueness of this thesis lies in the fact that few extant studies examine the effect of these factors on the predictive ability of $EARN$ and its components for developing countries.

The MENA region countries examined in this thesis are Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates. The other countries of the MENA region such as Algeria and Iraq do not have enough data to get valid statistical inferences. Moreover, these countries have relatively small stock exchanges with small number of listed firms. Overall, since the selected countries comprise the majority of listed firms in the MENA region as depicted in Figure 1.1, this thesis examines only the ten above mentioned countries, as representatives of the MENA region.

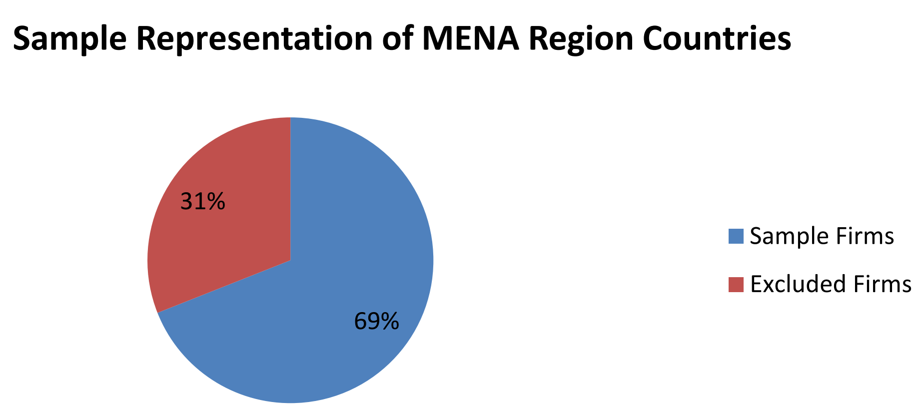

Figure 1.1: Sample Representation of MENA Region Countries (Source: *OSIRIS*)

1.2 Research Background

Bowen, Burgstahler and Daley (1986) is considered as one of the first studies that empirically investigates the FASB assertion, which states that $EARN$ is superior to the CFO in predicting the $FCFO$. Inconsistent with the FASB assertion, they provide evidence that the CFO provides no worse and, in some cases, superior predictions compared to $EARN$. Using a longer time horizon, results of a study conducted by Finger's (1994) reveal that CFO is more accurate in predicting the $FCFO$ for short time horizons; whereas, $EARN$ and CFO have the same predictive ability for longer time horizons. In contrast, Lorek and Willinger (1996), Dechow *et al*. (1998) and Kim and Kross (2005) show that current $EARN$ enhances predictions of the $FCFO$ than does the current CFO, supporting the FASB assertion.

The inconsistent results of these early studies can be attributed to the fact that they employ different estimated proxies for the CFO in testing its predictive ability as the statement of cash flows was not one of the mandatory statements until the FASB (1987) and the IASB (1992) added it as one of the mandatory statements. This, in turn, may lead to measurement errors in computing the CFO from other financial statements, and may negatively affect the ability of CFO to predict the $FCFO$. When the studies start to use the reported CFO in the statement of cash flows, these studies find that the reported CFO is a superior predictor of the $FCFO$ compared to $EARN$ (e.g., Barth *et al*., 2001; Al-Attar and Hussain, 2004).

However, upon the disaggregation of $EARN$ into CFO and ACC components (the change in accounts receivable, the change in inventory, the change in accounts payable, depreciation, amortization, and other accruals), Barth *et al*. (2001) and Al-Attar and Hussain (2004) find that the addition of ACC components to current CFO provides incremental information in predicting the $FCFO$ relative to the current CFO or even aggregate $EARN$. Thus, both studies provide evidence that the various ACC components capture different information about future cash flows; while this information is masked by aggregate $EARN$.

In addition, Krishnan and Largay (2000) disaggregate $EARN$, focusing mainly on disaggregating the CFO rather than disaggregating ACC, in their cash flow prediction models. Consistent with the importance of disaggregation concept when predicting the $FCFO$, Krishnan and Largay find that disaggregating the CFO into direct method (henceforth, DM) components of the statement of cash flows improve the accuracy of the cash flow prediction models, beyond models using the aggregate CFO.

Therefore, the main aim of this thesis is to examine whether current aggregate $EARN$ or current CFO is superior in predicting the one-year-ahead CFO. This thesis also investigates whether the predictive abilities of $EARN$, CFO and ACC increase if they are disaggregated into their components. Furthermore, this thesis continues by exploring the factors that might affect the predictive ability of $EARN$ and its components. There are many variables that may enhance or reduce the predictive ability of $EARN$ and its components, such as earnings management, unintentional managerial errors, and accounting conservatism.

Earnings management, through discretionary accruals and real activities manipulation, is one of the main factors that might impact the cash flow prediction process. Firm managers may intentionally engage in earnings manipulation by using their discretion over accounting accruals and accounting choices, presumably for a private gain, and thus report numbers based on distorted estimates (i.e. discretionary accruals) (Dechow, 1994; Dechow and Dichev, 2002). Nam *et al*. (2012) and Badertscher, Collins and Lys (2012) find that discretionary accruals in this case decrease the informational value of $EARN$ and ACC, and in turn their ability to predict the $FCFO$.

However, although discretionary accruals can be used opportunistically and can distort the information in earnings, it can improve the information content of earnings by allowing managers to signal their private information about future cash flows (Farshadfar and Monem, 2011; Nam *et al*., 2012; Badertscher *et al*., 2012). Nevertheless, there is relatively scarce evidence (e.g., Subramanayam, 1996; Al-Attar, Hussain and Zuo, 2008; Nam *et al*., 2012; Badertscher *et al*., 2012) on whether managerial discretion is used to distort earnings' informativeness and its predictive ability, or to convey useful information that help in predicting the $FCFO$. Consequently, this thesis seizes this opportunity and examines the effect of discretionary accruals on the predictive ability of $EARN$ and its components in the MENA region firms.

Thus, the aforementioned studies assume that the accrual component of earnings can be manipulated through discretionary accruals, while the cash flow component of earnings is free from manipulation. Although, the main goal behind the real earnings management is to alter the reported earnings, these activities may also affect the cash flows as well. Real activities manipulation, such as providing sales discounts and lenient credit policies, overproducing to decrease cost of goods sold (henceforth, COGS), and reducing research and development (henceforth, R&D) and advertising expenditures in order to improve earnings performance, have a direct effect on cash flows. Lee (2012) states that reducing R&D and advertising costs has a positive effect on the current CFO, while activities such as sales discounts and overproduction have a negative effect on the current CFO. Considering both effects, Roychowdhury (2006) finds that, on average, firms that manage earnings upward using real activities manipulation have lower CFO than expected. Therefore, earnings manipulation through real activities affects cash flows, and as a result, reported cash flows is likely to reflect management incentives as accruals (Roychowdhury, 2004; 2006).

Although, the real activities manipulation can affect both cash flows and accruals, the impact of these activities on the predictive ability of $EARN$ and its components has not been examined in detail in accounting literature. One of the few papers that tackled the relationship between real earnings management and the predictive ability of $EARN$ is Li (2019). However, Li only focuses on one form of real earnings management, which is the abnormal reduction in the discretionary expenditures, while she ignores the other two forms. She finds that real activities manipulation through the abnormal reduction in discretionary expenditures decrease the ability of $EARN$ to predict the $FCFO$. Thus, this thesis contributes to the literature and measures the effect of the three forms of real earnings management, sales manipulation, overproduction, and abnormal reduction of discretionary expenditure, on the predictive ability of $EARN$ and its components.

To sum up, the existing literature provides little evidence on the impact of discretionary accruals and real earnings management on the predictive ability of $EARN$ and its components. Hence, this thesis aims to expand the literature and provide a new contribution on how firms' earnings manipulation behaviors can affect the cash flow prediction process.

Even in the absence of intentional earnings management, large accruals may be associated with a reduced quality of reported earnings due to increased measurement errors in managers' accruals estimates, as a result of management lapses and environmental uncertainty (Dechow and Dichev, 2002). Dechow and Dichev argue that earnings manipulated by managers for opportunistic reasons often behave similarly to earnings that result from unintentional managerial errors. They argue that from an accounting perspective, recording a false receivable and not collecting it looks similar to recording an actual receivable and not collecting it.

Therefore, the intentional earnings management and unintentional managerial errors in estimating accruals, due to the uncertainty in the firm's operating environment, might affect the predictive ability of $EARN$ and its components. Thus, this thesis is considered the first attempt to disentangle intentional earnings management from unintentional managerial errors and examine their effect on the predictive ability of $EARN$ and its components to identify the impact of each of these errors separately. The thesis will also identify which of these errors have a more significant impact on the predictive ability of $EARN$ and its components.

Thus, although earnings management and unintentional managerial errors are among the main factors that are expected to affect the predictive ability of $EARN$ and its components, another strand of literature starts to consider the effect of the accounting conservatism on the predictive ability of $EARN$ and its components. In this regard, Kim and Kross (2005) find that the predictive ability of $EARN$ has been increasing over the years in the US context, possibly due to the adoption of an increasing number of conservative accounting standards, such as FAS 114, Accounting by Creditors for Impairment of a Loan, and FAS 121, Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed.

Accounting conservatism implies the exercise of caution in the recognition and measurement of income and assets. It requires early recognition of expenses and expected future losses in earnings and the deferral of revenues and gains until they are verified (Basu, 1997). Hence, expenses and losses are more promptly reflected in financial statements than revenues and gains. Kim and Kross (2005) argue that if losses impact the ability of the firm to generate future cash flows, timeliness recognition of losses can make financial statements more relevant for cash flow prediction purposes. They support their argument and find that increasing the level of accounting conservatism has contributed to enhancing the ability of $EARN$ to predict the $FCFO$. Consistent with the findings of Kim and Kross (2005), Bandyopadhyay, Chen, Huang and Jha (2010) provide evidence that accounting conservatism enhances the ability of current $EARN$ to predict the $FCFO$.

While accounting conservatism and its effect on firms have been discussed widely in the existing literature, with evidence from developed countries, few studies have examined the relation between the predictive ability of $EARN$ (and its components) and accounting conservatism. Therefore, this thesis examines whether accounting conservatism increases the ability of current $EARN$ and its components to predict the $FCFO$.

1.3 Research Aim, Questions and Objectives

The main aim of this thesis is to examine the ability of $EARN$ and its components to predict the one-year-ahead CFO and analyse the factors that can affect their predictive ability. The first model aims to identify the ability of current $EARN$ to predict the one-year-ahead CFO, and the second model assesses the predictive ability of current CFO to compare between these two models. In addition, this thesis replicates the results first documented by Krishnan and Largay (2000) and Barth *et al*. (2001) about the importance of disaggregating

$EARN$, CFO and ACC into their components when predicting the $FCFO$ by using data from the MENA region countries to provide an out-of-sample evidence. Given the wide variety of models this thesis aims to compare between, only the ability of these models to predict the one-year-ahead CFO is analyzed.

To achieve this aim, the following research questions are proposed:

(i) What is the role of current $EARN$, CFO and ACC, along with their disaggregated components, in predicting the one-year-ahead CFO for firms in the MENA region?;

(ii) Do intentional earnings management and unintentional managerial errors affect the ability of current $EARN$ and its components in predicting the one-year-ahead CFO for firms in the MENA region?; and

(iii) Does accounting conservatism affect the ability of current $EARN$ and its components in predicting the one-year-ahead CFO for firms in the MENA region?

To answer the above research questions, the following objectives and tasks are carried out:

1. Provide a comprehensive literature review regarding the ability of $EARN$ and its components to predict the $FCFO$.
2. Identify the factors that might affect the predictive abilities of $EARN$, CFO and ACC.
3. Analyse the abilities of current $EARN$, CFO and ACC, and their disaggregated components in predicting one-year-ahead CFO in the MENA region firms.
4. Identify which model has the superior ability to predict the one-year-ahead CFO in the MENA region firms.

5. Determine whether earnings management and unintentional managerial errors have a significant effect on the ability of current $EARN$ and its components to predict one-year-ahead CFO in the MENA region firms.
6. Determine whether accounting conservatism has a significant effect on the ability of current $EARN$ and its components to predict one-year-ahead CFO in the MENA region firms.

1.4 Research Contribution

The contribution of this thesis is divided into two main parts. The first part aims mainly to test the cash flow prediction models developed and examined by Krishnan and Largay (2000) and Barth *et al*. (2001). Both studies focus mainly on developed countries, and there is a significant lack in studies that test cash flow prediction models in developing countries generally and the MENA region specifically. Thus, to fill in this gap, this thesis replicates these studies by testing the ability of $EARN$ and its components in predicting the one-year-ahead CFO in the developing countries of the MENA region. The results of this thesis provide an out-of-sample test of the previous research carried out in developed countries especially that it is not expected that models that work well in developed countries can work well in developing ones as there are institutional differences between both countries.

Although most studies focus on examining the predictive ability of aggregate $EARN$ versus aggregate CFO, some studies disaggregate $EARN$, CFO and ACC into their components when assessing their ability to predict the $FCFO$. Krishnan and Largay (2000) and Barth *et al*. (2001) argue that each component reflects different information about the $FCFO$, resulting in different weights in prediction. In contrast, aggregate $EARN$, CFO or ACC

implicitly places the same weight on each component, masking information relevant to predicting the $FCFO$.

Consistent with their argument, Barth *et al.* (2001) provide evidence that model based on the aggregate CFO and ACC components together obtain a superior prediction of the $FCFO$ over models based on aggregate $EARN$ or CFO. Furthermore, Krishnan and Largay (2000) find a notable improvement in cash flow prediction accuracy after disaggregating CFO into the DM components of the statement of cash flows. In contrast, Nam *et al*. (2012) and Cheng and Hollie (2008) find no statistically significant increase in prediction accuracy for the $FCFO$ when disaggregating ACC into its main components or disaggregating the CFO into the DM components, respectively. These results are consistent with the argument that models, which include more variables, do not necessarily outperform simpler models in producing superior forecasts (Finger, 1994; Lorek and Willinger, 1996).

Given this debate about whether the disaggregation of $EARN$, CFO and ACC into their components improves the prediction of the one-year-ahead CFO, this thesis provides a comprehensive analysis of different models that use both aggregate predictors ($EARN$, CFO and ACC) and their disaggregated components to identify which model provides superior prediction of the one-year-ahead CFO. Specifically, this thesis starts with identifying which of $EARN$ or CFO provides superior predictions of the one-year-ahead CFO in MENA region firms. Moreover, this thesis sheds light on the predictive ability of disaggregated components of $EARN$, CFO and total ACC, followed by disaggregating the CFO into the DM components, and disaggregating total ACC into its main components for firms in the MENA region. Although many studies examine the predictive ability of CFO

and disaggregated ACC components (e.g., Barth *et al*., 2001; Al-Attar and Hussain, 2004; Ebaid, 2011), few have provided evidence on whether disaggregating CFO into the DM components enhances cash flow prediction models. Accordingly, a lack of comprehensive evidence on the advantages of the DM components, especially in predicting the $FCFO$, creates an opportunity for this thesis.

Current knowledge on the predictive ability of the DM components is provided by only a few studies, including Krishnan and Largay (2000), Cheng and Hollie (2008), Orpurt and Zang (2009) and Farshadfar and Monem (2013a). While all conclude that the DM components are useful in cash flow prediction, these studies focus mainly on developed countries, such as the US and Australia; and thus, these results cannot be generalized to developing countries that have different characteristics. Consequently, this thesis addresses this shortcoming by investigating the role of the DM components in predicting the one-year-ahead CFO across a wider range of countries and more recent data. By using a broad sample of firms from ten countries in the MENA region, instead of examining only one country, this thesis is able to extend the literature and provide deeper and more representative evidence. In addition, the thesis provides some of the first direct evidence from developing countries of the MENA region on the usefulness of the DM of the statement of cash flows.

The thesis also places considerable emphasis on the techniques applied to test the cash flow prediction models. Precisely, this thesis uses several methods to provide robustness checks, and ensure that the results are not affected by the shortcomings of any method. The first approach employed to test the research hypothesis is the in-sample regression analysis. However, there is a strong debate on whether in-sample regression analysis should be interpreted as prediction tests (Watts and Leftwich, 1977; Kim and Kross, 2005; Lev *et al*., 2010). Watts and Leftwich provide empirical evidence for the inconsistency between goodness-of-fit statistics, such as adjusted R-squared statistics and predictive ability. In contrast, to in-sample regression analysis, out-of-sample studies do not rely on statistical correlation for evidence (Francis and Eason, 2012). Instead, out-of-sample prediction tests compare between predicted and actual outcomes and use superior prediction accuracy as the basis for model selection (Nam *et al*., 2012; Francis and Eason, 2012). Accordingly, this leads to the emergence of out-of-sample prediction tests.

In this respect, many prior studies (e.g., Barth *et al*., 2001; Al-Attar and Hussain, 2004) investigate the association between $EARN$ (and its components) and the $FCFO$ using an in-sample regression analysis. However, in-sample regression analysis is not a prediction test and may even provide misleading inferences concerning prediction (Lev *et al*., 2010). Thus, a parallel line of studies uses out-of-sample prediction tests as a way of solving the problems inherited in the in-sample regression analysis (e.g., Kim and Kross, 2005; Lorek and Willinger, 2010; Lev *et al*., 2010; Nam *et al*., 2012). These studies suggest that for a model to be judged as a good prediction model, it should pass the out-of-sample test, as it is expected to be a more informative than an in-sample regression analysis.

This thesis addresses this issue and extends cash flow prediction research by documenting both in-sample regression analysis and out-of-sample prediction tests, and compares between these two methods of prediction tests. Thus, this is considered one of the main contributions in this thesis as previous studies, that attempted to compare between these two methods, focus only on few prediction models. Thus, thesis extends their results by testing six different cash flow prediction models using these two methods to compare between their results.

The second part of this thesis aims to contribute to the literature by testing some new measures of factors affecting the predictive ability of current $EARN$ and its components and by introducing new factors that might affect their predictive ability. The importance of this contribution emerges from that fact that although there is an increased research on examining different cash flow prediction models, there is a significant lack in research studies that examine the factors that might affect the cash flow prediction process. Several factors can affect the predictive ability of current $EARN$ and its components such as discretionary accruals, unintentional managerial errors, real activities manipulation, and accounting conservatism. Although there are some studies that test the impact of discretionary accruals and accounting conservatism on the predictive ability of current $EARN$ and its components (e.g., Subramanyam, 1996; Kim and Kross, 2005; Nam *et al*., 2012), this thesis extends their results by using new measures of both factors. Furthermore, although real activities manipulation and unintentional managerial errors are expected to have a major impact on the predictive ability of current $EARN$ and its components, no study has attempted to test the impact of these factors on the predictive ability of current $EARN$ and its components, thus this thesis is the first study to test the effect of these factors.

The first factor that this thesis aims to test is discretionary accruals. Although there are various models proposed in the literature to measure discretionary accruals, most of the studies that test the effect of discretionary accruals focus on the Jones (1991) model, as modified by Dechow, Sloan and Sweeney (1995) and there is a significant gap in studies that use other models of discretionary accruals. Specifically, these models range from simple models, in which total accruals are used as a measure of discretionary accruals to the relatively sophisticated regression models, which decompose total accruals into discretionary and nondiscretionary components (Bartov, Gul and Tsui, 2000). However, some studies raise questions concerning the validity of the modified Jones model in capturing discretionary accruals accurately (e.g., Francis *et al*., 2005; Siregar and Utama, 2008; Dechow, Ge and Schrand, 2010).

The modified Jones model identifies accruals as abnormal if they are not explained by a limited set of fundamentals; plant, property and equipment (henceforth, PPE) and changes in revenues, (Francis *et al*., 2005; Dechow *et al*., 2010). In particular, the modified Jones model systematically misclassifies nondiscretionary accruals into discretionary accruals (Siregar and Utama, 2008; Farshadfar and Monem, 2011). To mitigate the limitations of the modified Jones (1991) model, this thesis uses an alternative model proposed by Dechow and Dichev (2002), as modified by Francis *et al*. (2005). The modified Dechow and Dichev model is the variation of the unexplained current accruals after controlling of the CFO in the current, prior and future periods augmented with the two fundamental variables from the modified Jones model (PPE and changes in revenues).

In addition, the modified Dechow and Dichev model is able to disentangle the intentional managerial actions in accounting to manage earnings (i.e., discretionary accruals) from unintentional errors in accrual estimates due to environmental uncertainty. Hence, the use of the modified Dechow and Dichev model enables this thesis to test the impact of the second factor that might affect the predictive ability of $EARN$ and its components by differentiating between the impact of intentional and unintentional managerial errors on the predictive ability of $EARN$ and its components. Although many studies use the modified Dechow and Dichev model to examine numerous economic hypotheses, no prior study in the cash flow prediction literature has used this model to distinguish between the impact of intentional and unintentional errors on the predictive ability of $EARN$ and its components. This distinction is important because most existing research assume that earnings quality is only affected by management intent to manipulate; while such intent is unobservable, and likely idiosyncratic and sporadic (Dechow and Dichev, 2002). In this respect, this thesis represents an important contribution to existing research.

The third factor to consider is real activities manipulation. Despite the fact that real activities manipulation might have an impact on the predictive ability of $EARN$ and its components as they have direct cash flow consequences, which might make cash flows not in their normal level in a given period leading to difficulties in predicting cash flows in subsequent periods, there is a significant lack of studies that test this impact. The only exception is Li (2019) who examines the impact of only one form of the real activities manipulation (i.e., cutting discretionary expenditures) on the predictive ability of $EARN$. However, real activities manipulation can appear in many forms such as sales manipulation and overproduction strategy (Roychowdhury 2004; 2006), thus this thesis examines these other measures of real activities manipulation on the predictive ability of $EARN$ and its components to extend the evidence on the relationship between real activities manipulation and cash flow predictions.

Finally, the last factor to analyse is accounting conservatism. Accounting conservatism is divided into conditional and unconditional conservatism. Despite the fact that these two types of accounting conservatism are used in accounting literature, there is paucity in the literature, especially for measuring the impact of conditional conservatism on cash flow prediction process. Ever since Basu (1997) first provide systematic evidence for the existence of accounting conservatism, many studies have examined various country-wide and firm-specific factors that explain the demand for conservatism. Nevertheless, existing research pays little attention to the economic consequences of or benefits from conditional conservatism, measured by the Basu (1997) model, on the performance of cash flow prediction models.

Hence, this thesis is considered the first study to provide systematic evidence on the impact of both types of accounting conservatism, either conditional or unconditional, on the ability of $EARN$ and its components in predicting the one-year-ahead CFO. The findings of the relation between accounting conservatism and the predictive ability of $EARN$ (and its components) are of particular importance, because conservatism is one of the highly debated concepts in accounting. The IASB (2010) eliminates the conservatism principle from its updated Conceptual Framework and claims that conservatism introduces biases into financial reporting; in addition, it is incompatible with neutrality[1]. Specifically, although conservatism argues for the early recognition of losses compared to gains, neutrality argues that accountants should equally deal with both gains and losses as there is no scope for asymmetry in the degree of verifiability needed for the recognition of gains compared to losses (Barker, 2015). Recently, a significant number of studies in the literature offers a support for accounting conservatism in the financial reporting (Barker

[1] Barker (2015) argues that although academic research tends to use prudence and conservatism as synonymous, there is a distinction between both concepts. Nonetheless, in this thesis, the term conservatism is used, as it is more commonly applied in academic research, and prudence is considered as a specific type of conservatism (Barker, 2015; Mora and Walker, 2015).

and Mcgeachin, 2015; André, Filip and Paugam, 2015); thus, the IASB reintroduces it in its Conceptual Framework in 2018.

Since this thesis tests the relationship between accounting conservatism and the ability of $EARN$ and its components in predicting the $FCFO$ in the MENA region as whole and the GCC and non-GCC countries separately, as each region adapts to different accounting standards, the results of this thesis can contribute to the debate on the necessity of accounting conservatism in the IASB Conceptual Framework. Thus, the results of this thesis provide contributions to accounting standard setting bodies.

Although, research in this area has mostly concentrated on the relative predictive abilities of $EARN$ and CFO (e.g., Dechow *et al.*, 1998; Krishnan and Largay (2000), Barth *et al.*, 2001; Cheng and Hollie, 2008, Orpurt and Zang, 2009; Lev *et al.*, 2010; Lorek and Willinger, 2010), few studies analyse the factors that might affect the predictive ability of $EARN$ and its components. In conclusion, this thesis relates to a growing body of accounting literature on the factors that might affect the performance of cash flow prediction models.

1.5 Research Importance

Given the significant gap in studies testing the performance of cash flow prediction models in developing countries generally and the MENA region specifically, this thesis warrants a specific focus on this area due to the following reasons. First, the MENA region nowadays attracts many investors and entrepreneurs due the availability of natural resources, as the region is considered the home of vast oil supplies. The MENA region accounts for more than one third of the world’s oil production, which can attract foreign direct investment

(Caccia, Baleix and Paniagua, 2018). Second, the MENA region has witnessed fast economic growth over the past decades (e.g., the United Arab Emirates and Qatar) (Zeineddine, 2017; De Jong, Hoppe and Noori, 2019); and this, in turn, leads to attracting investment opportunities that offer high returns compared to that available in developed countries (Harvey, 1998). These factors highlight the importance of analysing the MENA region in academic research.

Cash flow prediction is essential to international investors. Lamech and Saeed (2003) argue that international investors usually prefer to see adequate cash flows in a sector before making serious commitments to it. They find that investors give high priority to adequate cash flows for ensuring a reasonable prospect of recovering costs and making an investment a success. Furthermore, as an investor can hold several investments, it is important to predict future cash flows in order to have effective cash management (Forsell and Furenstam, 2018). Therefore, examining the ability of $EARN$ and its components to predict the one-year-ahead CFO in developing countries of the MENA region firms is of a particular interest.

Although there is a vast amount of research on cash flow prediction models in developed counties, the cash flow prediction models that work well in these countries cannot be used in developing countries without further research due to the different nature of both countries. Specifically, developing countries have fewer listed firms, less mature investors, information asymmetry problems, and weaker registration and disclosure requirements (Ebaid, 2011). Moreover, accounting standards, audit quality, and regulatory monitoring tend to differ significantly from developed countries to developing ones, which can impact the results of the study and make cross-country comparisons more difficult (Orpurt and

Zang, 2009); especially in developing countries, which have weak regulatory environments compared to those in developed countries (Looney, 2005; Gill, Biger, Mand and Mathur, 2013; Kuo, Ning and Song, 2014).

Given the above evidence about the interesting investment opportunities in the MENA region and the increased interest of investors in obtaining accurate cash flow predictions in the region before investing, there is an increased demand on analysing cash flow predictions models in the MENA region to satisfy investors' needs.

1.6 Structure of the Thesis

This thesis is outlined as follows. Chapter 2 provides a detailed review of cash flow prediction literature. It begins by providing a historical overview of the development of the statement of cash flows, and what are the methods used to present this statement. Further, this chapter focuses on the importance of predicting the $FCFO$. Chapter 2 reviews the concepts relevant to cash-based accounting and accrual-based accounting, as well as the findings of the prior empirical research in predicting the $FCFO$. In this chapter, four main research hypotheses are developed concerning the prediction of the one-year-ahead CFO. Finally, this chapter provides a comparison between the results of developing and developed countries.

Chapter 3 provides a comprehensive overview on the factors that might impact the ability of $EARN$ and its components in predicting the one-year-ahead CFO. Chapter 3 develops the research hypotheses related to the impact of earnings management, unintentional managerial errors and accounting conservatism on the predictive ability of $EARN$ and its components.

Chapter 4 outlines the research methodology, and discusses the data collection and sample selection used to address the research questions. The accounting variables either dependent or independent used in this thesis are defined and discussed in detail. Finally, the econometric model specifications used to test the research hypotheses are presented and explained.

Chapter 5, the first empirical chapter, presents and discusses the results of the cash flow prediction models, beginning with a discussion of the descriptive statistics and correlation analysis. Chapter 5 presents the preliminary results of the study including in-sample regression analysis and out-of-sample prediction tests.

Chapter 6 presents and discusses the impact of earnings management and unintentional managerial errors on predictive ability of $EARN$ and its components, again beginning with a discussion of the descriptive statistics and correlation analysis. The chapter then goes on to discuss the regression results and hypothesis tests.

Chapter 7, the final empirical chapter, presents the impact of accounting conservatism on the predictive abilities of $EARN$ and ACC. This chapter begins with a discussion of the relevant descriptive statistics and correlation analysis, and then moving on to the regression results in order to test the hypotheses.

Finally, the thesis concludes in Chapter 8 with a summary of the important findings of the thesis. The chapter provides conclusions regarding the overall results and readdresses the research objectives, and it discusses the limitations of the thesis. In addition, the chapter provides implications and some suggestions and recommendations about future research in the field of the cash flow prediction.

Chapter 2

The Predictive Ability of Earnings and Its Components

2.1 Introduction

Cash flow prediction is one of the main tasks that affect economic decisions within the firm. Specifically, cash flow is an essential input in almost all decisions undertaken by internal and external users of accounting, such as managers, security analysts, and creditors (Chotkunakitti, 2005; Lev *et al*., 2010; Francis and Eason, 2012). Furthermore, future cash flows is a matter of concern for both investors and creditors (Al-Attar and Hussain, 2004; Nam *et al*., 2012). On the one hand, investors are concerned about future cash flows as they represent a potentially significant input for stock valuation models (Barth *et al*., 2001; Al-Attar and Hussain, 2004). On the other hand, creditors are concerned about future cash flows as they are the basis for making interest payments and the repayment of debt (Chotkunakitti, 2005).

The importance of cash flow prediction is supported by the Conceptual Framework of FASB and IASB. The FASB (1978) states that financial reporting should provide information to help users in assessing the amounts, timing, and uncertainty of expected future cash flows. The IASB (2018) states that financial reports should provide information about cash flows to assist accounting information users when assessing the firm’s ability to generate future cash flows. The IASB clarifies that this is the primary objective of financial reporting which is providing financial information about the firms which is useful to existing and potential investors and creditors in making decisions about providing resources to firms.

Therefore, cash flow prediction is a fundamental issue underlying the purpose of financial reporting. Consequently, there is a heated debate in the literature about which has the superior ability to predict $FCFO$, whether current CFO or current $EARN$ which implicitly includes both CFO and ACC. The FASB (1978) emphasizes that $EARN$ expressed on an accrual basis is superior compared to CFO in predicting $FCFO$. However, existing studies do not explicitly provide evidence concerning which is superior in predicting $FCFO$. Some researchers find that current CFO provides superior predictions of $FCFO$ than current $EARN$ (Finger, 1994; Farshadfar *et al*., 2008; Lorek and Willinger, 2009; Lev *et al*., 2010 Habib, 2010). However, others find information about $EARN$ is generally more predictive of $FCFO$ than current CFO (Lorek and Willinger, 1996; Dechow *et al*., 1998; Kim and Kross, 2005; Ebaid, 2011; Arnedo *et al*., 2012).

Despite prior literature examining the predictive ability of $EARN$ and its components is immense in developed countries especially the US, little is empirically known about this fundamental issue in developing countries. Thus, this thesis aims to extend the literature by examining the predictive ability of $EARN$ and its components in ten developing countries of the MENA region. Thus, the first step towards achieving this aim is to provide a comprehensive literature about the importance of cash flow prediction and the predictive ability of $EARN$ and its components.

This chapter focuses mainly on providing the background and literature review for the predictive ability of $EARN$ and its components. Thus, it proceeds as follows. Section 2.2 discusses the importance of cash flow prediction. Section 2.3 provides an overview of the development of the statement of cash flows, and compares it with the other financial statements. Section 2.4 discusses the predictive ability of CFO using information from the direct and indirect disclosure methods of the statement of cash flows. Section 2.5 and 2.6 focus on the importance of accruals-based earnings and comparison between the predictive ability of $EARN$ and CFO. Section 2.7 compares the results of existing studies about the predictive ability of $EARN$ (and its components) for developed and developing countries and Section 2.8 concludes.

2.2 The Importance of Cash Flow Prediction

Although, the Conceptual Framework of FASB and IASB includes cash flow prediction as a desirable characteristic for financial reporting; cash flow prediction does not receive sufficient attention as earnings predictions. Historically, the main focus of financial analysts is to provide information about earnings predictions, target stock prices, and stock recommendations (Call, 2008; Givoly, Hayn and Lehavy, 2009). Then, with the increased awareness about the importance of cash flow information especially after the appearance of many accounting scandals in the early 21st century analysts started to report information about cash flow predictions (Wasley and We, 2006; Pae, Wang and Yoo, 2007; Givoly *et al*., 2009). Analysts have gradually introduced cash flow predictions from 1993 and onwards, whereas earnings predictions are available since 1983 (Givoly *et al*., 2009; Pae and Yoon, 2012). The percentage of companies receiving earnings predictions along with cash flow predictions has climbed from 2.5 percent in 1993 to 57.2 percent in 2005 (Givoly *et al*., 2009).

Therefore, some studies attempt to explain the reasons behind the growing trend of analysts to report cash flow predictions. DeFond and Hung (2003; 2007) investigate the reasons for this upward trend in analysts' cash flow predictions in the US setting and an international setting, respectively. DeFond and Hung (2003) is considered the first study to provide an explanation for this upward trend by investigating the US companies over the period 1993 to 1999. They argue that analysts have provided more cash flow predictions in the recent years in response to demand by investors who are increasingly concerned about the inherent weaknesses of accruals, due to its subjectivity and its vulnerability to earnings management. However, cash flows is perceived to be less subjective and vulnerable to management manipulation than accruals, thus cash flows is commonly considered a valuable complement to earnings information.

DeFond and Hung (2003) hypothesized five situations in which cash flows are relatively more beneficial than accruals in interpreting earnings and assessing firm viability. First, analysts express suspicion about firms with large accruals and usually prefer the use of cash flows to validate earnings. Second, cash flows is also desirable measure to compare the performance of companies using different accounting methods because cash flows is independent of discretionary accounting accruals. Third, volatile earnings is probably a noisier measure and of a lower quality than cash flows, thus it is expected that greater earnings volatility is likely to increase the expected benefits of supplementing earnings predictions with cash flow predictions.

Fourth, analysts are likely to find cash flow predictions relatively more useful for firms with a high capital intensity (the ratio of total assets to sales revenue) because such firms rely on the CFO for the routine maintenance of existing assets and the purchase of new assets, as CFO is the primary source of internal financing (Kumar and Krishnan, 2008). Fifth, analysts also tend to predict cash flows for companies with a high leverage ratio (the ratio of total debt to equity). Cash flows is a traditional measure used for evaluating credit and bankruptcy risks, especially in high leverage firms (Schellenger and Cross, 1994).

Therefore, analysts are more likely to demand more information about the liquidity of highly capital intensive and highly leveraged firms because the likelihood of financial distress and bankruptcy increases as asset liquidity decreases (DeFond and Hung, 2003).

DeFond and Hung (2003) provide evidence to their argument and find that analysts are more likely to report cash flow predictions for firms having (i) large accruals; (ii) accounting method choices that differ from their industry peers; (iii) higher earnings volatility; (iv) higher capital intensity; and (v) higher risk of bankruptcy. In a supplementary study, DeFond and Hung (2007) examine 36 countries over the period 1994 to 2002. They find that most probably analysts provide cash flow predictions for firms in countries with weak investor protection. They justify that these countries which have poor investor protection laws and weak law enforcement result in environments having earnings that are less likely to capture underlying economic performance. Therefore, cash flow predictions are most probably useful for these countries than countries with strong investor protection.

Therefore, given the increasing trend in analysts' cash flow predictions, Wasley and Wu (2006) find that firms themselves started to follow the same trend by issuing cash flow predictions. Wasley and Wu examine a sample of 36,317 firm-year observations in the US context over the period 2000 to 2003 because the frequency of management cash flow predictions is very low before 2000. They find that not only the analysts' cash flow predictions that have increased in the previous decades but also there has been a dramatic increase in the issuance of management cash flow predictions since 2000, and the number of such predictions has become more than triple from pre-2000 levels.

Consistent with Wasley and Wu (2006), Pae and Yoon (2012) state that the demand for cash flow information among investors also influences management to provide cash flow predictions voluntarily. However, they argue that management cash flow predictions should not be considered as an ideal substitute for analyst cash flow predictions and vice versa, because analysts generally issue cash flow predictions more frequently than management, suggesting that analysts provide more timely cash flow information. In sum, investors demand for cash flow information likely provides incentives for both management and analysts to produce cash flow predictions.

Although investors demand is a common incentive for both analysts and management; there are other incentives for each one that is likely to be different in issuing cash flow predictions. Wasley and Wu (2006) find other incentives for management cash flows prediction rather than the incentives examined by DeFond and Hung (2003) for analyst cash flow prediction. For example, Wasley and Wu (2006) find that management generates cash flow predictions to signal good news in cash flows. They find that managers strategically disclose their cash flow predictions to mitigate the negative impacts of bad news in earnings; they are more likely to issue these predictions when there is a large increase in cash flows and when analysts are forecasting an earnings loss. However, firms are less likely to issue management cash flow predictions when the increase in earnings is primarily because of discretionary accruals, because doing so could draw attention to the upward manipulation in earnings. Therefore, management may not want to highlight large positive accruals through a cash flow prediction if the accruals are a result of earnings management, while analysts may have greater incentives to predict cash flows in these situations (DeFond and Hung, 2003).

Further, a number of studies show that the existence of analyst and management cash flow predictions have many benefits. Wasley & Wu (2006) argue that cash flow predictions reduce the freedom of managers to change the composition of cash flows versus accruals to achieve a targeted level of earnings, which may, in turn, reduce earnings management. Moreover, when examining the US companies over the period of 1993 through 2005, Call (2008) finds that the ability of current cash flows to predict future cash flows is greater for companies whose analysts generate cash flow predictions and it increases in the years immediately after analysts begin generating cash flow predictions.

In addition, analysts' cash flow predictions have an indirect benefit on the accuracy of analysts' earnings predictions. Pae *et al*. (2007) examine this issue in the US firms for the period 1993 to 2005. They find that analysts who start to produce cash flow predictions tend to experience enhancements in their earnings prediction accuracy relative to those who do not produce cash flow predictions. Moreover, analysts who stop issuing cash flow predictions experience reductions in their earnings prediction accuracy compared to those who continue issuing cash flow predictions. Pae *et al*. argue that analysts will gain a better understanding of the accrual and cash flow components of earnings in the process of predicting cash flows and the acquired knowledge helps them to improve and update their earnings predictions.

In conclusion, cash flow predictions either by analysts or management are becoming increasingly common. Thus, it is crucial to determine the cash flow prediction models that can accurately forecast the $FCFO$, especially in developing countries where there is a lack of research. Since one of the main benefits from the existence of the statement of cash flows is the facilitation of the process of cash flow prediction, it is essential to focus on how this statement was initiated and developed, and the methods used to present this statement. Thus, the next section provides an overview about the statement of cash flows.

2.3 The Development of the Statement of Cash Flows

Financial statements including the statement of financial position, the income statement and the statement of cash flows are the basis for assessing a firm's financial performance and position. Although the statement of financial position and the income statement are important neither presents information about cash inflows and outflows. Thus, the statement of cash flows is the only statement which provides information about the sources and uses of cash and the net change in cash balances during a given period. Consequently, the statement of cash flows serves the needs of many financial statement users. Despite the importance of this statement, it was underestimated by financial statement users in comparison to the statement of financial position and income statement (Kwok, 2002).

The statement of cash flows, in a form or another, has a long history in the US. In 1971, the Accounting Principle Board (APB) issued Opinion No. 19, officially required that a statement of changes in financial position, often referred to as a funds statement, should have been included as one of the main financial statements in the firm annual reports. However, this did not specify a single definition of funds or a required format for the statement. The term ''funds'' was ambiguous and inadequately defined, and firms defined it either as working capital or cash with a variety of definitions (Hales and Orpurt, 2013). Thus, financial statement users could not easily compare funds statements across companies without making many modifications and engaging in deeper analysis. During the early 1980s, the funds statement was the target of criticism because of the lack of comparability and a unified definition of "funds" (De Ricquebourg, 2013).

Therefore, standard-setting organizations in the US started to think about issuing a new statement with the aim of requiring firms to focus mainly on changes in cash and cash equivalents instead of changes in working capital. In late 1987, the FASB (1987) issued Statement No.95, which superseded APB Opinion No. 19 and called for a statement of cash flows to replace the more general funds statement. Five years later, the IASC (now the IASB) in 1992 also issued IAS 7 Statement of Cash Flows which requires an entity to present a statement of cash flows. Both the FASB (1987) and the IASB (1992) obligated firms to present their cash flow statements to ensure better disclosure of financial information. The IASB justifies that issuance of IAS 7 by arguing that regardless of a firm's revenue-generating activities, it still needs cash for its operations, to meet its obligations, and to provide returns to investors. Thus, the IASB stated that the statement of cash flows is so important that no exemptions would be given for any firm to disclose it.

Since then, the statement of cash flows has witnessed several development phases and its importance has significantly increased especially after the discovery of a large number of accounting scandals in the early 21st century such as those of Enron and WorldCom (Farshadfar *et al*., 2008; Baik, Cho, Choi and Lee, 2016). These scandals have raised investors' concern over potential earnings manipulation; thus, recently they are paying more attention to the statement of cash flows as one of the key financial statements (Wasley and Wu, 2006; Baik *et al*., 2016). In particular, investors prefer the use of CFO reported in the statement of cash flows to check the credibility of accruals-based earnings because they believe that CFO is difficult to manipulate and it comes from the main revenue-producing activities of the firm (Baik *et al*., 2016). Afterwards, IAS 7 states that cash flow information reported in the statement of cash flows is useful in assessing future cash flows and in enhancing financial statement users' ability to compare operating performance in different entities because it eliminates the effects of accounting accruals whereby different accounting treatments are used for the same transactions and events.

The FASB (1987) and the IASB (1992) require all business entities to disclose the statement of cash flows as an integral part of their main financial statements, and to classify cash receipts and payments in the statement of cash flows into cash flows related to operating, investing or financing activities. Operating activities include cash transactions that enter into the determination of net income. Investing activities involve the acquisition and the disposal of investments, PPE and intangible assets. Financing activities include equity and liability items such as obtaining resources from owners and borrowing money from creditors, and distributions such as dividends and repayment of borrowings (Kieso, Weygandt and Warfield, 2010).

Out of the three above categories of cash flows, CFO is considered as the most important one for financial statement users such as investors and creditors due to the following reasons. First, CFO provides an indication of a company's ability to generate cash flows from its main activity (Chotkunakitti, 2005; Baik *et al*., 2016). Second, CFO is used in calculating free cash flows, financial liquidity, and financial flexibility that indicate the company's ability to meet its short-term or long-term liabilities from cash flows generated from operating activities without the liquidation of any assets employed in its operation (Kieso *et al*., 2010).

The FASB (1987) and the IASB (1992) allow firms to present their net CFO either in the direct method (DM) or in the indirect method (IM) format. The DM discloses the components of CFO such as cash received from customers, cash paid to suppliers and employees, and cash related to interest and taxes, while CFO under the IM is reported after adjusting net income for non-cash items and changes in short-term accruals. Thus, the IM presents a reconciliation of net income to CFO without disclosing cash flow components.

In conclusion, since neither the statement of financial position nor the income statement presents information about cash flows despite the importance of this information to all financial statement users, the FASB and the IASB have develop the statement of cash flows and they require all business entities to disclose the statement of cash flows as an integral part of their main financial statements, and to classify cash receipts and payments in the statement of cash flows into cash flows related to operating, investing or financing activities. As long as the FASB and the IASB are concerned about cash flow information and statement of cash flows, they also become increasingly concerned about cash flow prediction. Thus, the next section provides an overview on research studies that analyse the predictive ability of cash flows alone. Then the following section continues by comparing the predictive ability of $EARN$ versus CFO.

2.4 The Predictive Ability of Cash Flows

Historically, studies have used different definitions and measures of cash flows, especially before the mandatory disclosure of the statement of cash flows as required by the FASB (1987) and the IASB (1992). Many studies find that different definitions and measures of cash flows lead to major differences in the accuracy of cash flows as a predictor of the $FCFO$ (Bowen *et al*., 1986; Percy and Stokes, 1992; Kim and Kross, 2005; Farshadfar *et al*., 2008; Lorek and Willinger, 2009).

Bowen *et al*. (1986) investigate the ability of $EARN$ in comparison with five measures of cash flows to predict one- and two-periods ahead CFO. They employ two traditional measures of cash flows which include simple adjustments to earnings which are: (i) earnings plus depreciation and amortization; and (ii) working capital from operations which is calculated by adjusting the first traditional measure of cash flows for other elements of earnings not affecting working capital such as gains and losses on asset sales. They also employ three alternative measures that need more extensive adjustments which are; (i) CFO in which it is calculated by adjusting working capital from operations for changes of non-cash current assets and current liabilities; (ii) cash flows adjusted for the period's investment activities to get cash flows after investment before financing activities; and (iii) cash changes that happened during the period due to operating, investing and financing activities.

Based on a sample of US companies over the period 1971 to 1981, the results of Bowen *et al*. (1986) show that cash flow measures, especially traditional measures, have superior predictive ability compared to $EARN$. Consistent with Bowen *et al*., Percy and Stokes (1992) use Australian data to examine the predictive ability of various cash flow measures and $EARN$, and find similar results. Further, Farshadfar *et al*. (2008) take the advantage of the availability of the reported CFO in the statement of cash flows in Australia to compare the traditional measures of cash flows, similar to those calculated in Bowen *et al*. (1986), with the reported CFO. By examining the Australian firms over the period of 1992 through 2004, Farshadfar *et al*. (2008) find that traditional measures are poor proxy for the actual CFO and less informative in predicting the $FCFO$ than the reported CFO.

Moreover, Kim and Kross (2005) and Lorek and Willinger (2009) argue that after the FASB mandated the publication of the statement of cash flows, the reported CFO in the statement of cash flows is likely to reduce noise and measurement errors versus algorithms that have been used as a proxy for CFO when predicting the $FCFO$. Thus, it is expected that the predictive ability of CFO would be enhanced after the FASB and the IASB mandated the publication of the statement of cash flows using either the DM or the IM.

2.4.1 The Predictive Ability of Direct Method Components of the Statement of Cash Flows

The FASB (1987) and the IASB (1992) allow firms to present their net CFO either by the DM or the IM format; however, they encourage firms to use the DM presentation. Historically, academics strongly supported the use of the DM (Clacher, De Ricquebourg and Hodgson, 2013), arguing that in times of uncertainty, the DM provides additional information to financial statement users, allowing them to assess the financial position of the firms in a more accurate way.

Moreover, the CFA Institute (2007) considers the mandatory use of the DM statement of cash flows as a vital reform needed to enhance financial reporting. The CFA Institute notes that the IM chosen by the majority of companies provide insufficient information for even a skilled analyst to estimate cash inflows and outflows from existing reported data, concluding that estimating cash flow components significantly reduces the reliability and usefulness of the information generated. However, the DM disclosure provides more information about the sources and uses of cash flows such as information about cash received from customers and cash paid to suppliers and employees. This information is not explicitly presented in the IM disclosure. Thus, knowing the specific sources of cash receipts and the purposes for which cash disbursements were made in prior periods may be useful in evaluating the $FCFO$ (Krishnan and Largay, 2000, Orpurt and Zang, 2009; Farshadfar and Monem, 2013a).

Therefore, compared to the IM disclosure, the DM disclosure provides information that may be useful in predicting the $FCFO$. It is clear that the IM is at the same time more complicated for the reader to understand, and less informative than the DM disclosure regarding actual cash flow components. For example, cash received from customers reported under the DM is perhaps the most important cash flow number and is the primary indicator of a firm's cash generating ability. Thus, the DM components provide more information about cash inflows and outflows that is essential input in analysing the performance of companies and predicting its $FCFO$.

Consequently, a small but growing body of empirical studies have been motivated by the discussion of the FASB, the IASB and the CFA Institute concerning the importance of the DM disclosure, especially in cash flow prediction. Krishnan and Largay (2000) is one of the earliest studies that examines the usefulness of direct versus indirect cash flow components, especially in predicting $FCFO$, by calculating mean absolute prediction errors in an out-of-sample period. They first use a small sample of 405 US firm-year observations that voluntarily report their CFO using DM over the period 1988 to 1993. They find that the DM components yield lower prediction errors than the IM components.

Further, they examine the predictive ability of not only reported DM components but also estimated DM components using a larger sample of 8,699 observations. Since the DM components are unavailable, then Krishnan and Largay (2000) estimate them from other financial statements, except for tax and interest payments which are required disclosures regardless of whether the IM or the DM is employed. For example, they estimate cash received from customers by a simple equation as they subtract sales from the change of accounts receivable during a period. Their results provide evidence that even the estimated DM components act similarly to the reported components and enhance the prediction accuracy compared to that of the IM components and aggregate CFO.

Orpurt and Zang (2009) conduct another US study for a sample of 604 observations from firms voluntarily using the DM disclosure, and a larger sample of 39,225 observations from firms that report their statements of cash flows using the IM over the period 1989 to 2002. They examine the usefulness of reported versus estimated DM information, and predictive ability of the estimated DM components in comparison with the aggregate CFO. They find that the estimated DM components have a higher predictive ability than the aggregate CFO. They also find that adding the DM components estimates into prediction models significantly improves cash flow prediction, though this improvement is reduced by the existence of noise in the estimates of the DM components.

Krishnan and Largay (2000) and Orpurt and Zang (2009) find severe articulation errors (the difference between reported and estimated CFO components) when the DM components are estimated from other financial statements, effectively casting doubt on the FASB (1987) assertion that the DM components can be accurately determined using financial statement information. Their findings are not surprising as some current asset and liabilities items reflect non-operating transactions caused by acquisitions, mergers, accounting changes and foreign currency exchanges (Orpurt and Zang, 2009; Hales and Orpurt, 2013). Regardless of the existence of severe articulation errors in the estimated DM components, they remain of great value to financial statement users beyond the aggregate CFO and the IM components, especially in predicting $FCFO$. Therefore, the importance of the DM components and the difficulty of accurately estimating or calculating them from financial statements remain of importance in the literature.

Most of the studies that are conducted to examine the usefulness of the DM components, especially in predicting the $FCFO$, rely on small, hand-collected samples of US firms which voluntarily report the DM statement of cash flows. Hence, the conclusions of such studies are potentially subject to data limitation problems and a self-selection bias, which limits the ability of authors to generalise their results to other countries (Arthur, Cheng and Czernkowski, 2010; Bradbury, 2011). Self-selection bias arises because not all companies report the DM statement of cash flows, and thus researchers are forced to focus on these companies only to obtain the DM components, causing a biased sample with nonprobability sampling.

Arthur and Chuang (2006), Chen, Xie, Zhang and Zhu (2011) and Farshadfar and Monem (2013a) address both the self-selection bias and estimation error problems inherent in the US studies by using the reported DM components mandatorily disclosed by the Australian and Chinese firms. Consistent with prior research, the three studies find that the DM components have significantly higher explanatory power than the aggregate CFO when predicting the $FCFO$. Further, the out-of-sample tests of Farshadfar and Monem (2013a) show that the DM components have lower prediction errors than the aggregate CFO. Therefore, Arthur and Chuang (2006), Chen *et al*. (2011) and Farshadfar and Monem (2013a) validate the findings of the US studies by Krishnan and Largay (2000) and Orpurt and Zang (2009) that the DM components are incrementally useful beyond the aggregate CFO in predicting $FCFO$.

Despite the general consensus that the DM disclosure significantly enhances the usefulness of cash flow information and improves cash flow prediction, the vast majority of countries such as the US, Canada, the EU and Switzerland still report the statement of cash flows using the IM format (Krishnan and Largay, 2002; Arthur *et al*., 2010; Chen *et al*., 2011). Recently, a few countries such as Australia, China, Indonesia, New Zealand, and South Africa became aware of the benefits of the DM disclosure and started to obligate their firms to use the DM when reporting the CFO (Arthur *et al*., 2010; Chen *et al*., 2011; Hales and Orpurt, 2013). However, the UK standard-setters still believe that preparing the DM disclosure is a time consuming, costly practice and that the costs of implementing this method exceed the benefits arising from it (Elliott and Elliott, 2007).

The FASB (1987) concludes that neither method provides benefits sufficient to justify demanding one and preventing the other and that both the DM and the IM provide potentially valuable information. The primary importance of the IM disclosure is that it highlights the difference between operating profit and the net CFO in the evaluation of the quality of earnings and accruals (Elliott and Elliott, 2007), and it is less costly than the DM disclosure (Krishman and Largay, 2000).

In conclusion, the superiority of the DM components in predicting the one-year-ahead CFO motivates many studies to conclude that the DM components are incrementally useful for predicting the $FCFO$ over and above the information contained in the current aggregate CFO (e.g., Krishnan and Largay, 2000; Cheng and Hollie, 2008; Orpurt and Zang 2009;

Chen *et al.*, 2011; Farshadfar and Monem, 2013a). Thus, this leads to the first hypothesis of this thesis which examines whether the DM components of the statement of cash flows have higher predictive ability than aggregate CFO in the MENA region firms:

H1: Current CFO disaggregated into DM components is superior compared to aggregate CFO in predicting the one-year-ahead CFO.

2.4.2 The Persistence of Core and Non-Core Cash Flow Components

One of the key methods employed to assess and predict the $FCFO$ is estimating the persistence of various cash flow components (Hales and Orpurt, 2013), where persistence captures the extent to which a firm's cash flows will recur in future periods. Thus, it is expected that the higher level of cash flow persistence, the more useful is cash flows in predicting the $FCFO$. Each component of cash flows has different persistence and consequently different predictive ability.

Cheng and Hollie (2008) examine the persistence of cash flow components, and the role of these components in predicting the $FCFO$ in a sample of 29,090 US firm-year observations during a sample period from 1988 to 2004. They disaggregate the CFO into "core" and "non-core" components where they estimate these components from the information in the financial statements. They classify the items that are closely related to income-generating operating activities such as the cash collected from customers and the cash paid to suppliers and employees as core cash flows. The cash flows related to interest, taxes and other expenses are classified as non-core cash flows, as they are closely related to financing and investing activities rather than operating activities. They argue that core cash flow components are generally the largest and main components of CFO and thus explain most of the variations in CFO. However, they argue that non-core cash flow components are expected to be less persistent than core cash flow components, and therefore should contribute less to the prediction of the $FCFO$.

Cheng and Hollie (2008) provide in their analysis three main findings. First, consistent with their argument, they find that core cash flow components have similar persistence among each other and persist more than non-core cash flow components. Second, they find that non-core components contribute less than core components in predicting the $FCFO$, and cash flows related to taxes do not even contribute. Third, they conclude from using in-sample regression analysis that disaggregating CFO into core and non-core cash flow components enhances the predictive ability of CFO, even when these components are estimated from other financial statements rather than the statement of cash flows. In contrast to in-sample estimations, their out-of-sample predictions tests indicate that the aggregate CFO model has lower prediction error than model contains the disaggregated CFO components. However, Krishnan and Largay (2000) perform a similar out-of-sample prediction test and do conclude that the DM components are incrementally useful than aggregate CFO components in predicting the $FCFO$.

The results of Cheng and Hollie (2008) about the lower contribution of the non-core cash flow components than core components in predicting the $FCFO$ may be relevant to the ongoing argument about classifying and reporting cash flows related to interest and taxes as operating cash flows rather than classifying them according to the activity which gave rise to them (i.e. investing or financing activities). The US GAAP requires firms to classify interest received, interest paid, and taxes paid as an operating activity in the statement of cash flows regardless of their purpose. In contrast, the IFRS recently allow managers flexibility to classify these items into operating, investing, or financing activities within the statement of cash flows.

The IFRS, as stated in IAS 7.33, permits interest either paid or received to be classified as operating cash flows if they enter into the determination of income. Alternatively, the IFRS enables interest paid and interest received to be classified as financing cash flows and investing cash flows if they are costs of obtaining financial resources or returns on investments, respectively. Baik *et al*. (2016) argue that greater flexibility in interest payments classification and the increased importance of the CFO give firms a strong motive to report higher CFO in their statement of cash flows in order to provide the market with positive perceptions of firm value and future cash flows. Thus, the misclassification of interest either under the US GAAP or the IFRS may have an adverse effect on its ability to predict the $FCFO$. Consistent with this argument, Arthur and Chuang (2006) find that interest which is related to financing activity is a poor predictor for the $FCFO$. Thus, if the interest related to financing or investing activity is categorized intentionally or unintentionally as operating activity, this will most probably lead to decrease the predictive ability of CFO.

Further, Cheng and Hollie (2008) and Farshadfar and Monem (2013a) argue that cash flows related to taxes should have less persistence and predictive ability than the other DM components for two reasons. First, tax cash flows is related to all aspects of the business, including both operating and non-operating cash outflows. IAS 7.35 states that it is impracticable for firms to classify taxes paid as cash outflows related to operating, investing or financing activities. Accordingly, taxes should generally be classified as operating cash outflows unless they can be specifically identified as financing or investing activities. Second, taxes paid may also be related to taxable income in different financial years. For example, as firms would like to defer taxes as much as possible, then less tax paid now will tend to lead to higher taxes paid in the future, but not necessarily in the near future. Therefore, these characteristics may weaken the relationship between cash flows related to taxes and the $FCFO$.

Even though cash flows do not suffer from estimation problems and different accounting treatments for the same transactions or events such as accruals, the flexibility and the misclassification of cash flow components under the IFRS and the US GAAP, respectively, may affect the predictive ability of CFO and its components. Regardless of these arguments and findings that non-core cash flows may have lower persistence and lower predictive ability compared to core cash flows, a small but growing body of empirical studies finds that the DM components (which includes both core and non-core components) leads to more accurate predictions of the $FCFO$ than aggregate CFO (Krishnan and Largay, 2000; Cheng and Hollie, 2008; Orpurt and Zang 2009; Chen *et al*. 2011; Farshadfar and Monem, 2013a).

Despite the importance of cash flows and the significant use of such information, users of financial statements ignore the information provided in the statement of cash flows even when it is presented under the DM, and prefer to obtain cash flow information from other financial statements (Kwok, 2002). Kwok argues that one possible explanation for relying too much on the balance sheet for cash flow information is that financial users are more familiar with this statement which has been around for decades while the statement of cash flows was only mandated more recently. Another reason why financial statements users prefer not to use the statement of cash flows may be their lack of training in using this particular statement. Kwok finds that none of the users notice the differences between the statement of cash flows and the funds flow statement or even between the DM and the IM in cash flow disclosure.

Therefore, the weak reliance of financial statements users on the statement of cash flows despite the claims of its usefulness asserted by the FASB and the IASB or by the results of many empirical studies such as Krishman and Largay (2000), Clinch, Sidhu and Sin (2002), Orpurt and Zang (2009), and Arthur *et al*. (2010) suggests that there is a growing need to increase financial statement users of the usefulness of this statement. In conclusion, financial statements users depend more on accrual-based financial statements and usually use $EARN$ to predict the $FCFO$ rather than CFO.

2.5 The Importance of Earnings

Reported earnings is one of the main measures of the financial performance of a firm, and thus it is more commonly used as a measure of performance compared to cash flows. For example, earnings is used in executive compensation plans, in the prospectuses of companies looking to go public, in debt covenants, and by investors and creditors (Dechow, 1994).

Richardson, Sloan, Soliman and Tuna (2005) argue that when cash receipts from business transactions and events occur in the same accounting period, earnings is expected to be equal to net cash receipts. In this case, the net cash receipts provide a completely reliable picture of the periodic financial performance of the firm. Nonetheless, when cash receipts and payments occur in a different accounting period compared to the business transaction that generates them, then earnings is not equal to net cash receipts. Thus, in this case, accounting accruals are introduced to give a more representative measure of periodic financial performance than net cash receipts alone.

The IASB (2018) states that accrual accounting records the financial transactions on the firm's assets and liabilities in the periods in which those transactions take place, even if the resulting cash receipts and disbursements happen in a different period. It emphasises that this is important because information about the firm's assets and liabilities, and changes in them during a period, provides a better basis for assessing the firm's past and future performance rather than information about the cash receipts and disbursements during that period alone. Thus, one main reason for the development of accrual accounting is the mitigation of the timing and matching problems inherent in cash flows in order to better measure firm performance.

Therefore, earnings is guided by two fundamental accounting principles which are the revenue recognition principle and the matching principle. The revenue recognition principle states that revenue is recognized when the firm has substantially completed a revenue generation process, no matter when cash is received. The matching principle requires companies to record the expenses that generated the revenues in the same period (Dechow, 1994; Al-Attar and Hussain, 2004; Kieso *et al.*, 2010). By applying such principles, the accrual process is expected to mitigate the timing and matching problems inherent in cash flows so that earnings is more closely reflecting firm performance as well as enhancing predictions regarding its future performance, including future cash flows (Dechow, 1994; Bartov, Goldberg and Kim, 2001; Nikkinen and Sahlström, 2004).

Despite the importance of accruals, they introduce a set of problems. This is because accrual-based earnings include managers' subjective estimates of uncertain future events, along with the opportunistic use of accruals by management and measurement errors inherent in accruals that could result in the reduced information content of earnings (Richardson, Sloan, Soliman and Tuna, 2001; DeFond and Hung, 2003). Therefore, Richardson *et al*. (2001) argue that accrual accounting involves a trade-off between relevance and reliability. For financial reporting information to be relevant, it should have predictive value or confirmatory value, while to be reliable, it should be complete, free from material errors and faithful in representation (IASB, 2018). While the information in accruals about expected future benefits and obligations are deemed to be relevant to financial statement users, it is also deemed to be less reliable than cash receipts and payments (Richardson *et al*., 2001; Lev *et al*., 2010). Consequently, a growing number of portfolio managers and financial analysts insist that cash flows is a more meaningful measure of business value and performance than earnings (Bartov *et al*., 2001).

Despite the previous argument that cash flows is preferable in measuring the business value and the claims that accruals are more subjective, academics as well as practitioners still focus on earnings as a measure of business value and performance. The IASB (2018) clarifies that information provided on an accrual-basis is much better than information simply concerning cash receipts and payments. This notion is also supported by the claims of the FASB (1978) that current $EARN$ expressed on an accrual basis is better than current CFO in predicting the $FCFO$.

2.6 The Predictive Ability of $EARN$ versus CFO

Following the argument of the FASB that $EARN$ is a superior predictor of $FCFO$ compared to CFO, numerous studies have examined the predictive ability of $EARN$ versus CFO. Some studies provide evidence supporting the FASB argument regarding the superior predictive ability of current $EARN$ over current CFO (Lorek and Willinger, 1996; Dechow *et al*., 1998; Kim and Kross, 2005; Ebaid, 2011). However, others do not support the FASB argument (Finger, 1994; Farshadfar *et al*., 2008; Lorek and Willinger, 2009; Habib, 2010; Lev *et al*., 2010). Dechow *et al.* (1998) and Barth *et al*. (2001) are considered significant review articles that serve as a basis to explain the role of $EARN$ and its components in predicting the $FCFO$.

2.6.1 The Dechow *et al.* Model versus the Barth *et al*. Model

Dechow *et al.* (1998) and Barth *et al*. (2001) are considered seminal in this field because they develop a model that has been widely used to investigate the ability of $EARN$ and its components to predict the $FCFO$. Dechow *et al*. (1998) examine the predictive ability of aggregate $EARN$. However, they do not examine the predictive ability of the ACC components which is subsequently investigated by Barth *et al*. (2001).

Dechow *et al.* (1998) model both CFO and the accrual process related to working capital accruals such as accounts receivable, accounts payable and inventory. They argue that the predictability of the $FCFO$ is observable in working capital (short-term) accruals rather than in long-term accruals, where working capital is the difference between total current assets and total current liabilities and it measures the net amount of a firm's relatively liquid resources (Kieso *et al*., 2010). Dechow *et al*. (1998) argue that working capital accruals are transformed to CFO in a short period so that their effects are observable in one-year-ahead forecasts, while long-term accruals are associated with cash flows over much longer time periods. They regress the $FCFO$ on current $EARN$ and CFO over the period 1963 to1992 for 1,337 US firms. They find that current $EARN$ is a superior predictor of the $FCFO$ compared to current CFO.

Thereafter, Barth *et al.* (2001) extend the work of Dechow *et al*. (1998) by employing a broader definition of accruals and focusing more on the concept of disaggregation through decomposing $EARN$ into CFO and six major ACC components (the change in accounts receivable, the change in inventory, the change in accounts payable, depreciation, amortization, and other accruals). Barth *et al*. (2001) extend the work of Dechow *et al*. (1998) in two ways. First, Barth *et al*. highlight that each component of $EARN$ has different information about the $FCFO$, resulting in different weights of prediction. In contrast, aggregate $EARN$ places the same weight on each $EARN$ component, masking information related to cash flow prediction. Second, they argue that the predictive ability of ACC is not limited to short-term accruals, but extends to long-term accruals such as depreciation of long-lived tangible assets and the amortization of intangible assets.

Barth *et al*. argue that even though the acquisition of depreciable or amortisable assets is initially considered as investing activities, these activities clearly relate to the operating activities of the firm. They argue that a firm might make such investments because they are expected to generate higher $FCFO$ over multiple periods than those generated from the firm's existing assets. They argue that if matching is achieved and the investment gains a positive return, then the cash inflows related to this investment will exceed its depreciation or amortization in each period. Thus, Barth *et al*. expect that the $FCFO$ have a significant positive relationship with depreciation and amortization.

Barth *et al*. examine 9,975 US firms to investigate the ability of $EARN$ components to predict the one-year-ahead CFO over the period 1987 to 1996. They provide evidence to support their arguments. They find that the predictive ability of $EARN$ for the $FCFO$ is improved by disaggregating $EARN$ into CFO and disaggregated ACC components. Moreover, they find that, along with short-term accruals, both depreciation and amortization have significant predictive ability for the one-year-ahead CFO. Therefore, this illustrates clearly how various ACC components can transfer information not only about the future cash flows arising from current operating activities, but also future cash flows that are related to investing activities.

Recently, Barth, Clinch and Israeli (2016) develop a new model to investigate the role of ACC in predicting the $FCFO$ which is closely related to the models developed by Dechow *et al*. (1998) and Barth *et al*. (2001). Barth *et al*. (2016) argue that current CFO in a specific period is related to economic factors from previous, current and next periods, as suggested by Dechow and Dichev (2002). Barth *et al*. (2016) assume that the current period economic factors can generate cash flows in the current period as well as in the previous and next periods, which is consistent with the accrual process.

Thus, their model differentiates between two types of accruals: (i) those that align cash flows in the current period and the next period's economic factors, for example, inventory and deferred revenue; and (ii) others that align cash flows in the next period and the current period's economic factors, for example, accounts receivables and warranty accruals. Their model shows that the information about the $FCFO$ reflected in accruals depends on those two types of accruals. They argue that each accounting amount (CFO and accruals related to the previous and next period's cash flows) reflects different information in cash flow prediction.

Despite the arguments of Barth *et al*. (2001) and Barth *et al*. (2016) to emphasize the importance of the disaggregated ACC components when predicting the $FCFO$, they differ in the way in which ACC should be disaggregated. Barth *et al*. (2001) disaggregate ACC into six main components which are short-term and long-term accruals. In contrast, Barth *et al*. (2016) do not differentiate ACC according to their classification in the statement of the financial position. However, they disaggregate it into two main types according to its relation with the expected cash received or paid after (before) the period of its economic factor.

Consistent with Barth *et al*. (2001), Barth *et al*. (2016) also investigate the ability of $EARN$ components to predict the one-year-ahead CFO. They examine 4265 US firms from 1990 to 2012 and find that the predictive ability of $EARN$ for the $FCFO$ is improved by disaggregating $EARN$ into CFO and the disaggregated ACC components as suggested by them. However, when Barth *et al*. (2016) make a comparison between their model and Barth *et al*. (2001) model, they find that prediction model which includes disaggregated ACC components in the way suggested by Barth *et al*. (2001) has a higher predictive ability than the model which includes ACC components as suggested by their study.

Furthermore, the results of Al-Attar and Hussain (2004), Ebaid (2011), Nam *et al.* (2012) and Arnedo *et al*. (2012) are to a great extent consistent with the findings of Barth *et al*.

(2001). Al-Attar and Hussain (2004), Ebaid (2011), Nam *et al.* (2012), and Arnedo *et al*. (2012) investigate the predictive ability of $EARN$ and its components in the UK, Egypt, the US and Spain, respectively. The four studies measure the predictive ability of four models (i) aggregate $EARN$; (ii) aggregate CFO; (iii) CFO and total ACC; and (v) CFO and disaggregated ACC into main components as suggested by Barth *et al*. (2001).

The analyses of Al-Attar and Hussain (2004), Ebaid (2011), Nam *et al*. (2012) and Arnedo *et al*. (2012) emphasize the importance of disaggregating ACC components when predicting the $FCFO$ as their analyses reveal that using the CFO and disaggregated ACC components together results in generating the highest explanatory power for the $FCFO$ compared to the other three models. Furthermore, Al-Attar and Hussain (2004) find that when CFO is used as the only predictor of the $FCFO$, it has higher explanatory power compared to that of aggregate $EARN$. Nonetheless, they show that the explanatory power of $EARN$ rises over that of the CFO when $EARN$ is disaggregated into the CFO and ACC components as suggested by Barth *et al*. (2001).

In conclusion, prior studies suggest that various ACC components of $EARN$ capture different information not only about delayed cash flows related to past transactions, but also about expected future cash flows related to management’s expected future operating and investing activities (Barth *et al*., 2001; Ebaid, 2011). Thus, it is apparent that the ACC components play a significant role in predicting the $FCFO$. However, most of the studies that test the predictive ability of ACC components focus mainly on developed countries, and there is a significant gap in studies that test the predictive ability of ACC components, in developing countries generally and the MENA region specifically. Based on the results of Barth *et al*. (2001), Al-Attar and Hussain (2004), Ebaid (2011), Nam *et al*. (2012) and Barth *et al*. (2016), this thesis predicts that disaggregating $EARN$ into CFO and ACC, in total or by individual components, enhances the ability of $EARN$ to predict the one-year-ahead CFO in the MENA region firms. This leads to the second hypothesis of this thesis, which is:

H2: Disaggregated current $EARN$ is superior compared to aggregate $EARN$ in predicting the one-year-ahead CFO.

The subsidiary hypotheses based on the extant literature are as follows:

H2.1: Current $EARN$ disaggregated into CFO and total ACC is superior compared to aggregate $EARN$ in predicting the one-year-ahead CFO.

H2.2: Current $EARN$ disaggregated into CFO and ACC components is superior compared to aggregate $EARN$ in predicting the one-year-ahead CFO.

2.6.2 In-sample versus Out-of-sample Prediction Tests

Many studies use the Barth *et al*. (2001) model to investigate the ability of $EARN$ and its components in predicting the $FCFO$. These cash flow prediction studies can be divided into two categories which are regression-based (in-sample) analyses or out-of-sample prediction tests (Lev *et al*., 2010). On the one hand, in-sample predictions use the goodness of fit criteria such as adjusted R-squared statistics as a way to assess the predictive ability of the variables under consideration. On the other hand, out-of-sample predictions use an inter-temporal holdout sample period not utilised in the model estimation to evaluate the predictive ability (Lorek and Willinger, 2010).

The results of the in-sample regression studies are to a great extent consistent with the findings of Barth *et al*. (2001). The in-sample regression analyses of Al-Attar and Hussain (2004), Ebaid (2011), Nam *et al*. (2012) and Arnedo *et al*. (2012) in different time intervals and countries, which have different sets of domestic accounting standards, emphasize the importance of disaggregating ACC components when predicting the $FCFO$.

While the reliance on adjusted R-squared statistics is common in the extant literature, it has received some criticism. A common criticism of adjusted R-squared as a criteria of model selection is that it does not sufficiently penalize the addition of a new variable and thus researchers may end up having models with large number of variables that are either marginally significant or insignificant which may affect the parsimonious nature of the model (Al-Attar and Hussain, 2004; Brooks, 2014). A regression analysis measures the ability of the set of independent variables to explain the variations in the dependent variable. Thus, although traditionally a model with high adjusted R-squared was judged as a good model, researchers start to criticise this by arguing that a higher adjusted R-squared does not imply a good forecast because the model can over-fit the data (Watts and Leftwich, 1977). However, out-of-sample prediction tests avoid the problems associated with using goodness of fit measures (i.e. adjusted R-squared statistics) as proxies for the predictive power. Therefore, Lev *et al*. (2010) argue that in-sample regressions cannot be considered as prediction tests and they may lead to inaccurate results concerning the performance of prediction models.

Given the previous criticism, Nam *et al*. (2012) and Arnedo *et al*. (2012) re-examine their cash flow prediction models using out-of-sample prediction tests. On the one hand, Nam *et al*. (2012) find no statistically significant increase in prediction accuracy for the $FCFO$

when disaggregating ACC into its six main components. These results are consistent with the argument that models which include more variables do not necessarily outperform simpler models in producing superior forecasts as adding more variables leads to reducing the degrees of freedom (Finger, 1994; Lorek and Willinger, 1996). On the other hand, Arnedo *et al*. (2012) confirm their in-sample regression analysis and find that the disaggregated accrual-based earnings model presents significantly the lowest out-of-sample prediction errors compared to the other models of their study.

Thus, the results of the in-sample regression analyses, which are based mainly on comparing the adjusted R-squared statistics between models, are not always consistent with the out-of-sample prediction results. However, for prediction purposes, the out-of-sample prediction tests are more reliable than in-sample regression analysis (Watts and Leftwich, 1977; Kim and Kross, 2005; Lev *et al*., 2010).

To overcome this criticism of in-sample regressions, researchers start to use out-of-sample predictions tests as an alternative to in-sample regressions. One of the earliest studies that uses out-of-sample prediction tests is Finger (1994) who examines the predictive ability of aggregate $EARN$ versus that of CFO in 50 US firms with long-run historical data from 1935 to 1987. The results show that CFO has a superior predictive ability compared to $EARN$ for short-term cash flow prediction, while both perform similarly in long-term cash flow prediction. In contrast, the out-of-sample results of Lorek and Willinger (1996), examining quarterly data, show that $EARN$ and ACC are superior compared to CFO in predicting the $FCFO$ in 60 US firms over the period 1979 to 1991.

Kim and Kross (2005) conduct another out-of-sample prediction test for 3,500 US firms over the period from 1973 to 2000 to compare between the ability of $EARN$ and CFO in predicting the one-year-ahead CFO. They do not focus on how well the disaggregation of ACC components enhances the predictive ability of $EARN$ as this issue is already examined by Barth *et al*. (2001). However, their main aim is to determine whether the predictive ability of $EARN$ has increased over the time. Their results show that both $EARN$ and CFO have significant ability in predicting the one-year-ahead CFO. Furthermore, they find that although the predictive ability of $EARN$ increases over time in their sample, the predictive ability of CFO does not increase at the same rate.

Kim and Kross (2005) find that accounting conservatism is playing a significant role in enhancing the predictive ability of $EARN$. They find a strengthening relationship between current $EARN$ and $FCFO$ for firms in industries that became increasingly conservative in their accounting. However, the relationship between $EARN$ and $FCFO$ remain stable over time for firms in industries that have either stable or decreasing accounting conservatism over the sample period.

Although Finger (1994), Lorek and Willinger (1996) and Kim and Kross (2005) conduct their research in a US context and use out-of-sample prediction tests; their results are inconsistent with each other. One explanation for this inconsistency is that each one of these studies uses a different cash flow measure. Although the out-of-sample prediction tests overcome the limitation of the in-sample regression analyses, the results of the previous studies are subject to another criticism that they have been conducted in the US where the CFO is unavailable and should be estimated. Finger *et al*. (1994), Lorek and Willinger (1996), and Kim and Kross (2005) use estimated CFO because the statement of cash flows only became mandatory in the US since 1988 (FASB, 1987) and their sample period started before that date.

In contrast, Lorek and Willinger (2009), Lev, Li and Sougiannis (2005; 2010), Cheng and Hollie (2010) and Francis and Eason (2012) conduct their US studies using out-of-sample prediction tests and data from the statement of cash flows rather than depending on the estimated CFO. The out-of-sample prediction tests of Lorek and Willinger (2009) and Lev *et al*. (2005; 2010) find that CFO is a superior predictor for the one-year-ahead CFO compared to $EARN$. Further, Lev *et al*. (2005) find that ACC, in total or by individual components, do not enhance the prediction of $FCFO$, beyond that achieved by current CFO alone. Additionally, Cheng and Hollie (2010) provide evidence that the out-of-sample prediction error of CFO based model outperforms more complex disaggregated ACC models in predicting the $FCFO$. However, Lev *et al*. (2010) find that the addition of working capital accruals (excluding inventory) improves prediction accuracy beyond that of CFO alone. Francis and Eason (2012) confirm that ACC improves the prediction of $FCFO$, as the prediction accuracy is greater for the model which includes CFO and ACC than the model which excludes ACC.

Apart from the US studies that have dominated this field and with the knowledge of the usefulness of the DM statement of cash flows over the IM, the studies of Farshadfar *et al*. (2008) and Habib (2010) benefit from the availability of DM statement of cash flows in Australia since 1992 to examine the predictive ability of $EARN$ and CFO using out-of-sample prediction tests. Both studies provide evidence that CFO is superior compared to $EARN$ in predicting the one-year-ahead CFO. Further, Habib finds that CFO still outperforms $EARN$ in predicting two and three year-ahead CFO; although, such superiority becomes less as the time horizon increases.

To sum up, the results of the US and Australian studies by Farshadfar *et al*. (2008), Lorek and Willinger (2009), Lev *et al*. (2005; 2010), Cheng and Hollie (2010) and Habib (2010) show that whenever a statement of cash flows is reported by the company using a well-organized method (DM or IM); this most likely improves the ability of aggregate CFO to predict the $FCFO$ more than aggregate $EARN$. Thus, there is a consensus in the previous studies that the predictive ability of CFO, reported in the statement of the cash flows, as a single predictor outperforms aggregate $EARN$. However, it is debatable whether disaggregating $EARN$ and ACC into their components enhances the cash flow prediction models, which is one of the main research questions in this thesis.

Researchers have been faced with many other aspects rather than (i) in-sample versus out-of-sample tests; (ii) reported versus estimated cash flow measure; and (iii) aggregate versus disaggregation of predictors (i.e., $EARN$, CFO and ACC) that may affect their prediction models such as estimating cash flows on the cross-sectional or time-series basis (Lorek and Willinger, 2010). For example, Barth *et al*. (2001), Kim and Kross (2005) and Nam *et al*. (2012) base their research on cross-sectional analysis; while Finger (1994) and Dechow *et al*. (1998) employ time-series prediction approach.

On the one side, cross-sectional approach restricts model parameters to be constant across firms, masking firm-specific variability inherent in current $EARN$ and CFO in relation to the $FCFO$ (Lorek and Willinger, 2010; Habib, 2010). On the other side, studies using a time-series approach typically investigate a smaller number of firms due to the necessity of focusing on each firm-specific parameter throughout a long time interval (Lorek and Willinger, 2010). They argue that while this procedure benefits from the firm-specific variability throughout a long time interval, it may suffer from generalizing research findings because it is related to a small set of sample firms.

In conclusion, the mixed results in the literature are due to many factors. However, once the cash flow prediction tests move away from in-sample regression analyses and the use of different estimated cash flow measures, the results point to the aggregate CFO as a superior predictor of the $FCFO$ compared to aggregate $EARN$. This shows how the role of $EARN$ in predicting the $FCFO$ in comparison to the CFO has declined, especially after the mandatory production of the statement of cash flows. This leads to the third hypothesis of the study, which is:

H3: Current CFO is superior compared to current $EARN$ in predicting the one-year-ahead CFO.

2.6.3 The Predictive Ability of the CFO Components and ACC Components

The previous empirical results show that aggregate $EARN$ and CFO are good predictors of the $FCFO$, while some studies find that their predictive abilities are enhanced by disaggregating each one of them to their components (e.g., Barth *et al*., 2001; Krishnan and Largay, 2000). Despite the poor performance of disaggregated models in the out-of-sample prediction tests, still some studies which use these tests find that disaggregation notion enhances the predictive ability of $EARN$ and its components. On the one side, disaggregating $EARN$ into CFO and six main ACC components suggested by Barth *et al*. (2001) enhance the predictive ability of $EARN$ more than aggregate $EARN$ (e.g., Arnedo *et* *al*., 2012). On the other hand, disaggregating CFO into DM components also improve its predictive ability (e.g., Krishnan and Largay, 2000; Orpurt and Zang, 2009). It is then arguable whether full disaggregation of both CFO and ACC components together leads to a superior cash flow prediction.

Therefore, Krishnan and Largay (2000) are motivated by the paucity of research on this fundamental issue and examine the predictive ability of disaggregated CFO and ACC information in the US context. Their out-of-sample prediction tests find that the inclusion of CFO components in the Barth *et al*. (2001) model significantly enhances the CFO prediction models. Hence, both CFO and ACC components provide substantial improvement in the CFO prediction model beyond that of the aggregate CFO and ACC.

Subsequently, Farshadfar and Monem (2013b) are motivated by the availability of the disclosed DM components reported by Australian listed firms. They examine 4520 firm-year observations over the period from 1992 through 2004. Farshadfar and Monem examine whether the ability of $EARN$ in predicting the $FCFO$ is improved by aggregating or disaggregating CFO and ACC components through examining three models: (i) aggregate CFO and ACC; (ii) aggregate CFO and disaggregated ACC into its six main components as suggested by Barth *et al*. (2001); and (iii) disaggregated CFO into DM components and disaggregated ACC. Their out-of-sample prediction results are similar to those conducted in the US as they find that the model which includes both the disaggregated DM components and disaggregated ACC components are superior compared to the other models in predicting the $FCFO$.

In conclusion, prior studies that examine the role of accounting data in predicting the $FCFO$ concentrate mainly on the predicative abilities of aggregate $EARN$, CFO and ACC. However, the role of CFO and ACC components in predicting the $FCFO$ is not fully understood. Barth *et al*. (2001) provide the first evidence on the role of $EARN$ components, particularly ACC components, in the prediction of $FCFO$. Further, Orpurt and Zang (2009) find that including the CFO components instead of aggregate CFO in cash flow prediction model significantly improves the prediction of $FCFO$. Their results, however, do not provide a clear insight into the relative importance of CFO and ACC components together in predicting the $FCFO$. Krishnan and Largay (2000) and Farshadfar and Monem (2013b) show that full disagregation model which incorportes both CFO and ACC components is superior compared to the model which includes the aggregate CFO and total ACC. Therefore, these studies show that both the DM components of the statement of cash flows and ACC components together can be used to improve the CFO predictions in the future. This leads to the fourth hypothesis of the thesis, which is:

H4: Current $EARN$ disaggregated into the DM and ACC components is superior compared to current $EARN$ disaggregated into aggregate CFO and total ACC in predicting the one-year-ahead CFO.

2.7. Developed Countries versus Developing Countries

Although most of prior research in the area of cash flow prediction models focuses on developed countries, there is a significant dearth in studies testing cash flow predictions models in developing countries despite the fact that these countries offer a rich environment for testing cash flow prediction models for the following reasons. First, developing countries have characteristics that are distinct from those of mature capital market because they have fewer listed firms, less mature investors, information asymmetry problems and weaker registration and disclosure requirements (Ebaid, 2011). Second, accounting standards, audit quality and regulatory monitoring tend to differ significantly from developed countries to developing ones which can impact the results of the study and make cross-country comparisons more difficult (Orpurt and Zang, 2009), especially in developing countries which have weak regulatory environments compared to those in developed countries (Looney, 2005; Gill *et al.*, 2013; Kuo *et al*., 2014). Third, as a result of these differences, one should be cautious in generalizing research findings from developed countries to developing ones.

Despite geographical proximity, language and cultural ties of the MENA region countries, there are still many differences between these countries. Specifically, some of the MENA region countries are characterized by being wealthy countries that have large reserves of natural resources and have high GDP per capita such as the GCC countries (Othman and Zeghal, 2010; Piesse, Strange and Toonsi, 2012). In contrast, there are other countries in the MENA region that are characterized by their lack of natural resources and by political and economic challenges such as Egypt and Tunisia (Kandil, 2009; Dimitrova *et al*., 2019).

Anandarajan and Hasan (2010) argue that companies in the MENA region countries with higher levels of economic development perform better and have an incentive to provide greater information. Thus, it is expected that the performance of cash flow prediction models might vary between the MENA region countries based on the economic growth of the country.

Furthermore, accounting system reforms including the IFRS adoption also vary across the MENA region countries. According to the *OSIRIS* database, the IFRS are required in most of the MENA region countries (e.g., Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab of Emirates), while the rest of the MENA region countries (e.g., Egypt, Tunisia and Morocco) are converging to the IFRS as a way to attract international investors. Accounting system reforms through the adoption of IFRS are expected to improve the efficiency of capital markets by enhancing transparency and credibility of financial statements in general, and of $EARN$ in particular (De Ricquebourg, 2013; Abdallah, 2016). This might, in turn, result in improving the predictive ability of $EARN$ in the countries that follow the IFRS more than countries still using the domestic accounting standards.

Therefore, the MENA region countries are unquestionably different in many aspects, including economic development, accounting and financial reporting standards and practices and the efficiency of their stock markets (Othman and Zeghal, 2010; Abdallah, 2016). However, there are limited efforts in the academic research to examine how these differences can affect the prediction of future cash flows. This, in turn, might explain the disparities in the results in academic research testing cash flow prediction models. Thus, future research in cash flow prediction models should focus more on how economic, political and accounting regulations can affect the performance of cash flow prediction models.

This section attempts to shed further light on the cash flow prediction models in an developing countries setting, focusing on the MENA region. The results of an in-sample regression analysis conducted by Ebaid (2011) for Egypt, as a developing country, are to a great extent consistent with the findings of the in-sample regression analyses for developed countries such as Barth *et al*. (2001) and Al-Attar and Hussain (2004). Other in-sample regression analyses show that the results for developing countries are not always consistent with those conducted for developed countries. For example, Telmoudi, Noubbigh and Ziadi (2010), Al-Debi'e, (2011) and Hammami (2012) examine the predictive ability of $EARN$ and its components in Tunisia, Jordan, and Qatar, respectively. The three studies find that CFO alone is a superior predictor of the $FCFO$ compared to $EARN$.

When Chotkunakitti (2005) uses out-of-sample prediction tests for Thai listed companies, she finds that the predictive ability of CFO is superior compared to the predictive ability of $EARN$, consistent with the out-of-sample prediction tests conducted for the US such as Finger (1994), Lorek and Willinger (2009) and Lev *et al*. (2005; 2010). Further, Chotkunakitti (2005) argue that since the income statement and the balance sheet prepared using the accrual basis may allow for flexible accounting methods and manipulative processes aimed at increasing the firm's performance, the statement of cash flows has more useful information for different users of accounting. Thus, the next chapter aims to discuss whether these flexible accounting methods and earnings manipulation can affect the cash flow prediction process.

In conclusion, the opportunistic use of accruals or the unintentional errors by managers inherent in accruals could result in the reduced information content of $EARN$ (Dechow, 1994; Bartov *et al*., 2001). Therefore, these results suggest that CFO is a superior predictor of the $FCFO$ compared to $EARN$. Based on the above argument, it can be deduced that a reason why CFO in developing countries has the superior predictive ability compared to $EARN$ is the existence of significant earnings manipulation and unintentional errors in these countries due to a lack of managerial skills in such countries. Therefore, this might decrease the predictive ability of ACC compared to CFO in such countries.

2.8 Conclusion

This chapter provides a discussion on the ability of current $EARN$ and its components (CFO and ACC) in predicting the $FCFO$ which is the fundamental issue in accounting and finance literature. The chapter builds on an extensive literature and reviews the theory, and evidence from extant cash flow prediction studies. The first major stream of cash flow prediction studies have concentrated on the usefulness of current aggregate $EARN$ and current CFO as predictors of the $FCFO$. However, the results of these studies are inconsistent with each other. Some researchers find that CFO alone provides superior predictions of $FCFO$ compared to $EARN$ (Lorek and Willinger, 2009; Lev *et al*., 2010; Habib, 2010). In contrast, others find that $EARN$ is superior compared to CFO in predicting the $FCFO$ (Dechow *et al*., 1998; Kim and Kross, 2005; Ebaid 2011; Arnedo *et al*., 2012). Further, other studies have shown that the predictive ability of $EARN$ is improved when it is disaggregated into its major CFO and ACC components (Krishnan and Largay, 2000; Barth *et al*., 2001).

The mixed results in the literature are due to many factors: (i) methodological differences (the contrast between in-sample regression analysis and out-of-sample prediction tests); (ii) measurement approach (the estimated CFO versus the reported CFO in the statement of cash flows); (iii) aggregation versus disaggregation of predictors (i.e., $EARN$, CFO and ACC); and (iv) estimation methods (time-series versus cross-sectional regression analyses).

In the extant literature, most of the studies that examine the association between $EARN$ and CFO with respect to the $FCFO$ use in-sample regression analyses and a variety of estimated CFO measures. However, Lev *et al*. (2010) argue that in-sample regression analysis is not prediction test, and may provide misleading outcomes concerning prediction ability. Moreover, Kim and Kross (2005) and Lorek and Willinger (2009) argue that the estimated CFO is likely to be a noisier measure than the reported CFO in the statement of cash flows. Given the importance of the statement of cash flows in providing information to financial statement users in order to assess financial performance and predict the $FCFO$, there is general agreement across different accounting regimes to mandate the statement of cash flows, required under IFRS since 1992, allowing either the DM or the IM disclosure.

Therefore, studies have recently moved away from in-sample regression analyses and estimated cash flow measures, and towards the investigation of the predictive abilities of $EARN$ and CFO using out-of-sample prediction tests and the CFO reported under the DM or the IM disclosures. The results point to CFO as a superior predictor of the $FCFO$ compared to $EARN$. Thus, the role of $EARN$ in predicting the $FCFO$, when compared to CFO, has declined, following the mandatory production of the statement of cash flows. Therefore, the first main issue in this thesis is to examine whether the predictive ability of CFO is superior compared to $EARN$.

The second major stream of cash flow prediction studies examine how the disaggregation process can enhance the prediction of the $FCFO$ (e.g., Krishnan and Largay, 2000, Barth *et al*., 2001; Al- Attar and Hussain 2004; Cheng and Hollie, 2008). Although, many studies find that when current CFO is used as the only predictor of the $FCFO$, it has higher predictive ability compared to that of current aggregate $EARN$ (Barth *et al*., 2001; Al-Attar and Hussain, 2004). Nonetheless, they show that the predictive ability of $EARN$ rises over that of CFO when $EARN$ is disaggregated into CFO and ACC components as suggested by Barth *et al*. (2001), because of the higher information content of the disaggregated $EARN$ compared to the aggregate $EARN$ or even the aggregate CFO.

Therefore, many studies examine the aggregated predictors, such as $EARN$ and CFO, and further focuses on their disaggregated components such as (i) disaggregating CFO into the DM components of the statement of cash flows; (ii) disaggregating $EARN$ into the aggregate CFO and total ACC; (iii) disaggregating $EARN$ into aggregate CFO and disaggregated ACC to its major components as suggested by Barth *et al*. (2001); and (iv) the full disaggregation model with disaggregated CFO and ACC components.

These studies have also reported conflicting findings. Some studies have documented that disaggregating $EARN$ into CFO and total ACC improves the predictive ability of $EARN$ and further disaggregation of ACC into its main components enhance even more the predictive ability of $EARN$ (Barth *et al*. 2001; Al-Attar and Hussain 2004; Arnedo *et al*., 2012). Moreover, Krishnan and Largay (2000) find that the inclusion of CFO components significantly enhances cash flow prediction. Therefore, these studies provide evidence that disaggregating $EARN$, CFO and ACC into their components is essential when predicting the $FCFO$.

However, Nam *et al*. (2012) and Cheng and Hollie (2008) find no statistically significant increase in prediction accuracy for the $FCFO$ when disaggregating ACC into its six main components or CFO into the DM components. Therefore, examining the role of $EARN$, CFO and ACC and their disaggregated components in predicting the $FCFO$ is the main theme of this thesis. Therefore, the second main issue this thesis looks at is whether there are significant gains to the disaggregation of $EARN$, CFO and ACC into their components, with regard to predicting the $FCFO$. Chapter 3 discusses the factors that might affect the predictive ability of $EARN$ and its components: earnings management and unintentional managerial errors.

Chapter 3

Factors Affecting the Predictive Ability of Earnings and Its Components

3.1 Introduction

Although the Conceptual Framework of FASB and IASB includes cash flow prediction as a desirable characteristic for financial reporting, cash flow prediction does not receive sufficient attention as earnings predictions. Historically, the main focus of financial analysts was to provide information about earnings predictions, target stock prices, and stock recommendations (Call, 2008; Givoly *et al*., 2009). Pae and Yoon (2012) state that the literature on the cash flow prediction accuracy, either done by management or analyst, is relatively new.

After the appearance of many accounting scandals in the early 21st century, analysts started to report information about cash flow predictions with the increased awareness about the importance of cash flow information (Wasley and We, 2006; Pae *et al*., 2007; Givoly *et al*., 2009). Therefore, one of the main aims of the this thesis is to examine the variables that might impact the ability of $EARN$ and its components (CFO and ACC) in predicting the $FCFO$.

Based on different managerial incentives, earnings management can affect the predictive ability of $EARN$ and its components differently. On the one hand, managers may engage opportunistically in self-serving earnings management that makes $EARN$ and its components misleading and does not provide fair representation of the firm's future performance and future cash flows (Nam *et al*., 2012; Badertscher *et al*., 2012; Farshadfar and Monem, 2011; Li, 2019). In this case, manager may report numbers based on either distorted estimates, i.e. discretionary accruals or make operational business decisions such as offering price discounts to temporarily boost sales revenues, i.e. real activities manipulation, to manipulate earnings. On the other hand, firms can use earnings management to communicate private information about firms' future profitability and future cash flows (Nam *et al*., 2012; Badertscher *et al*., 2012; Farshadfar and Monem, 2011; Li, 2019). Hence, whether these decisions or activities are made in good faith or with manipulative intent, $EARN$ and its components can be either informative or misleading in predicting the $FCFO$. Thus, the effect of earnings management on the predictive ability of $EARN$ and its components is still one of the debatable areas in accounting literature.

Furthermore, Dechow and Dichev (2002) state that the earnings quality is not limited to managerial incentives, but are also related to the inherent difficulty in estimating accruals. Thus, managerial unintentional errors in estimating accruals due to the economic uncertainty facing organizations might react similar to earnings management and affect the predictive ability of $EARN$ and its components. However, previous studies do not differentiate between the independent roles of intentional earnings management and unintentional managerial errors on the predictive ability of $EARN$ and its components

Accounting conservatism also might be one of the factors that might affect the predictive ability of $EARN$ and its components. Accounting conservatism can be defined as a policy of recognizing probable future expenses and losses in current earnings and delaying the recognition of possible future revenues and gains until they are verified (Basu 1997; Watts, 2003). Thus, this policy may result in understating net assets and net income rather than overstating them. Thus, the main aim of accounting conservatism as an accounting concept is to constraint managerial opportunistic behaviour and also offset managerial biases through the verification process of accounting numbers (Watts, 2003). Therefore, accounting conservatism is expected to have a positive impact on the ability of $EARN$ and its components to predict the $FCFO$.

In conclusion, despite the extensive accounting literature analysing whether $EARN$ or its components has the superior ability to predict the $FCFO$ (e.g., Dechow *et al.*, 1998; Barth *et al*., 2001; Kim and Kross, 2005; Farshadfar *et al.*, 2008; Lorek and Willinger, 2009; Lev *et al*., 2010), still very little is known about factors affecting $EARN$ and its components when predicting the $FCFO$; thus, one of the objectives of this thesis is to fill this gap by exploring the fundamental factors affecting these components such as earnings management, unintentional managerial errors and accounting conservatism.

This chapter focuses mainly on providing the background and literature review for some fundamental factors that might affect the ability of $EARN$ and its components to predict the $FCFO$ which are earnings management, unintentional managerial errors, and accounting conservatism. Thus, this chapter proceeds as follows. Section 3.2 discusses the definition and types of earnings management, firm characteristics that lead to unintentional managerial errors, and how these errors along with earnings management can affect the predictive ability of $EARN$ and its components. Section 3.3 discusses the definition and types of accounting conservatism and its effect on the predictive ability of $EARN$ and its components. Section 3.4 discusses the accounting characteristics of the MENA region and Section 3.5 concludes.

3.2 Intentional and Unintentional Managerial Biases

Earnings and its components can be of poor quality for two main reasons: (i) management could intentionally bias earnings, which in turn affects cash flows and accruals, through earnings management; and (ii) unintentional managerial errors in estimating accruals due to the difficulty of predicting an uncertain future (e.g., overestimating the creditworthiness of a new customer). Although both of these roles have been extensively investigated in the existing literature, there is a huge gap in the literature examining their effect on the predictive ability of $EARN$ and its components.

Concerning earnings management, there is extensive literature that shows that managers use discretionary accruals, real activities manipulation and classification shifting to manipulate earnings. As for unintentional managerial errors, Dechow and Dichev (2002) state that the quality of earnings is not limited to managerial opportunism, but are also related to the inherent difficulty in estimating accruals for firms with specific characteristics such as small-sized firms and firms with longer operating cycles, in which these characteristics indicate more uncertainty, more estimation and errors of estimation, and thus lower the quality of earnings. Whether earnings is intentionally manipulated or unintentionally mistakenly estimated, in both cases, these errors might affect the ability of $EARN$ and its components to predict the $FCFO$. Thus, this issue is further decomposed into research hypotheses that are discussed in the following subsections in details. Consequently, this chapter starts with earnings management as one of the important variables that might affect the performance of the cash flow prediction models.

3.2.1 Earnings Management

Even though earnings management has already drawn the attention of a considerable amount of academic research, there is no consensus in the literature regarding an accepted definition of earnings management. However, Schipper (1989) and Healy and Wahlen (1999) are considered significant review articles that serve as a basis for understanding the concept of earnings management. A common definition by Schipper (1989, p.92) who defines earnings management as "purposeful intervention in the external financial reporting process with the intent of obtaining some private gain." Another widely accepted definition by Healy and Wahlen, (1999, p.368) who provide a comprehensive definition that best describes earnings management as follows: "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."

While earnings management has several definitions, they share the same underlying meaning which is intervening in the financial reporting process to achieve some private gain, which implicitly reflects opportunistic practices. However, although earnings management is considered as opportunistic; this does not mean that it is fraudulent activity. Earnings management practices differ from fraud since these practices can fall within the bounds of the flexibility afforded by both the IFRS and the GAAP.

Therefore, earnings management is initiated from the flexibility inherent in accounting regulations which allows managers to make accounting judgments and estimates that are suitable for each business environment. Consequently, managers can use these judgments and estimates opportunistically to manage their companies' earnings, possibly to expand the value of the firm. In contrast, managers can also use accounting judgment and estimates to make financial statements more useful for users. In conclusion, earnings management can make the information environment more transparent or more opaque. Because of these two conflicting motives, the earnings management can be classified as efficient or opportunistic.

3.2.2 Efficient Versus Opportunistic Earnings Management

There are two main schools of thought in the accounting literature with respect to the use of earnings management. The first school of thought is the efficient or informational earnings management. Healy and Wahlen (1999), Jiraporn, Miller, Yoon and Kim (2008), Siregar and Utama (2008) and Adut, Holder and Robin (2013) argue that despite the negative views associated with earnings management, it can be beneficial since it can potentially enhance earnings informativeness through management's credible communication of private information to stockholders and the public.

According to this school, Healy and Wahlen (1999) argue that managers use their knowledge about the business and its opportunities to select reporting methods and accounting judgments and estimates that match the firms' business economics, thus improving the value of accounting information and making financial reports more informative for external users (Healy and Wahlen, 1999). They argue that this can happen if certain accounting choices or estimates are perceived to be credible signals of a firm's financial performance. For example, if auditing is effective, managers' estimates of net receivables will be viewed as a credible prediction of future cash flows. Thus, managers reflect their private information in future cash flows, thereby providing $EARN$ with a higher ability to predict the $FCFO$ (Nam *et al*., 2012; Badertscher *et al*., 2012). Specifically, managers use the flexibility inherent in accounting regulations to improve the relevance and reliability of accounting data reported in financial statements to enhance its predictive ability and representational faithfulness (Badertscher *et al*., 2012).

The second school of thought is the opportunistic view of earnings management. According to this school, managers engage in accounting judgement and estimates especially with regard to accrual choices in order to make their firms appear healthier than they really are. Therefore, opportunistic earnings management happens when accounting estimates and judgments are intentionally chosen to mislead stakeholders about the actual economic performance of the firm (Healy and Wahlen, 1999). Specifically, managers manipulate accounting information to increase the firm's stock price to artificially high levels, and take advantage of the overvaluation in terms of equity-based compensation (Nam *et al*., 2012; Badertscher *et al*., 2012).

According to this school of thought, earnings management create distortions in the reported accounting numbers producing less reliable accounting earnings that do not reflect a firm's financial performance. Therefore, relevance and reliability, and henceforth, predictive usefulness and representational faithfulness, become secondary considerations when earnings is manipulated for opportunistic reasons (Badertscher *et al*., 2012). Consequently, Badertscher *et al*. argue that managerial judgements and estimates that are motivated by opportunistic reasons are expected to negatively affect the ability of $EARN$ and its components to predict the $FCFO$.

Despite the existence of two schools in accounting literature concerning earnings management, the view which suggests that managers manage earnings efficiently does not fall within the definition of earnings management, provided by Schipper (1989) and Healy and Wahlen (1999), implies that most of the managers are likely to manage earnings opportunistically. Whether or not managers use earnings management to achieve their desired goals or to convey their private information, they could have various methods to do this.

3.2.3 Earnings Management Methods

There are three main methods used to manage earnings: (i) accrual-based earnings management; (ii) real activities-based earnings management; and (iii) classification shifting-based earnings management. Managers can implement any of these methods to help them to achieve their desired goals. Historically, research on earnings management has focused mainly on accrual-based earnings management. However, Zang (2012) suggests that concentrating exclusively on accruals manipulation does not fully explain earnings management activities.

Recently, a large number of empirical accounting literature starts to focus on the three various methods of earnings management along with the relationship with other variables such as corporate governance, ownership structure, firm characteristics, and accounting standards and regulations. However, there is a significant paucity in research studies that test how earnings management can affect the ability of $EARN$ and its components to predict the $FCFO$. This gap represents one of the main contributions of this thesis by analyzing whether the predictive ability of $EARN$ and its components is affected by earnings management behaviour.

3.2.3.1 Accruals-Based Earnings Management

Accruals-based earnings management occurs when managers borrow earnings from future periods to increase current period earnings through recording revenues before they are earned or delaying the recognition of expenses which have been incurred (Leuz, Nanda and Wysocki, 2003; Abernathy, Beyer and Rapley, 2014). Conversely, managers can push earnings from the current period to future periods; managers sometimes understate earnings in years of good performance to create reserves for future periods or to avoid governmental intervention by appearing less profitable (Mulford and Comsikey, 2002; Leuz *et al*., 2003; Abernathy *et al*., 2014). Thus, either borrowing or pushing earnings to increase or decrease current earnings, this creates what is called discretionary accruals (or also abnormal and unexpected accruals) in the literature.

The discretionary accruals also result from the accounting judgments and estimates made by managers in financial reporting. For instance, managers are required to estimate various future financial events such as expected useful life and residual values of fixed assets, obligations for pension funds and other post-retirement benefits, the amount of bad debts, and asset impairments. Managers should also select one of the different acceptable accounting methods to account for the same economic transactions, such as the straight-line method, activity method or diminishing charge method to determine the amount of depreciation each year. Managers may also switch between the methods of inventory pricing such as changing from first-in, first-out (FIFO), last-in, first-out (LIFO) and average-cost inventory methods because these different methods reflect differently on the inventory values and the COGS (Healy and Wahlen, 1999; Richardson *et al*., 2005).

Therefore, managers can exploit the flexibility inherent in both the IFRS and the GAAP by making unreliable accruals estimation or select one of the different accounting methods to manipulate earnings. For instance, managers can estimate lower uncollectible receivables or higher useful lives and residual values of depreciable assets to decrease expenses, thereby managing earnings upwards and vice versa. Moreover, if inventory costs are increasing overtime due to inflation, then, the use of FIFO leads to minimizing the COGS and maximizing earnings compared to LIFO (Wild, Shaw and Chiappetta, 2010). Managers may switch from one method to another to obtain a lower or higher COGS in the income statement, thus achieving lower or higher earnings. Further, discretionary accruals might also be used to understate liabilities through manipulating the expected obligations for pension funds, accrued expenses payable and environmental claim (Richardson *et al.*, 2001; Mulford and Comiskey, 2002).

One of the earliest studies that examines the role of the discretionary accruals in cash flow prediction process is Subramanyam (1996) who provides evidence on this issue by investigating the relationship between $EARN$ components and the $FCFO$. He disaggregates $EARN$ components into current CFO, non-discretionary accruals and discretionary accruals, which are then used to explain the one-year-ahead CFO within in-sample regression analysis. He employs Jones (1991) model to differentiate between discretionary and non-discretionary accruals. He investigates a large sample of 2,808 US firms from 1973 to 1993. His results show that discretionary accruals add informational value to $EARN$ when predicting the $FCFO$. He provides evidence that the flexibility inherent in accounting regulations allows managers to reflect value-relevant information in $EARN$ that helps in predicting the $FCFO$. Therefore, these results are consistent with the efficient rather than the opportunistic earnings management.

Motivated by the results of Subramanyam (1996), Al-Attar *et al*. (2008) examine also the role of discretionary accruals in predicting the $FCFO$ using 4,024 firm-year observations in the UK firms over the period 1994 to 2004. They conclude that Subramanyam's results hold true for the UK firms suggesting that discretionary accruals are not simply the product of noisy accruals manipulation by managers but include beneficial information for market participants that help in predicting the $FCFO$.

Further, Farshadfar and Monem (2011) extend the work of Subramanyam (1996) by investigating the role of discretionary accruals in predicting the $FCFO$ in a sample of 340 Australian firms over the period 1992 to 2004. However, given the limitations of in-sample tests used by Subramanyam (1996) and Al-Attar *et al*. (2008) as mentioned in Chapter 2, Farshadfar and Monem (2011) use both in-sample and out-of-sample prediction tests in order to provide better evaluation of the predictive ability of $EARN$ components.

In addition, Farshadfar and Monem employ the forward-looking model proposed by Dechow, Richardson and Tuna (2003) to differentiate between discretionary accruals and non-discretionary accruals instead of the Jones (1991) model used by Subramanyam (1996) and Al-Attar *et al*. (2008). They argue that the main criticism facing the Jones model is that it considers accruals as abnormal if they are not explained by the limited set of fundamentals (PPE and changes in revenues) (Dechow *et al*., 2003; Francis *et al*., 2005; Dechow *et al*., 2010). Farshadfar and Monem (2011) argue that the Jones (1991) model sometimes misclassifies nondiscretionary accruals into discretionary accruals, thus this lead to erroneous classifications of some components of nondiscretionary accruals as discretionary accruals. This might explain the positive association between discretionary accruals and future cash flows. However, Dechow *et al.* (2003) argue for the effectiveness of their model in estimating discretionary and non-discretionary accruals as compared to the Jones (1991) model. Nonetheless, the Dechow *et al.* model is not widely used as a measure of the discretionary accruals and still the Jones model is the dominant measure in the earnings management literature due to its simplicity.

Despite the above differences between Farshadfar and Monem (2011) and Subramanyam (1996), both studies reach the same conclusion that discretionary accruals provide a greater value in predicting the $FCFO$ more than non-discretionary accruals. Thus, their results show that discretionary accruals can enhance the information content of $EARN$ by allowing managers to signal their private information about future cash flows rather than using them opportunistically. Furthermore, Farshadfar and Monem (2011) find that discretionary and non-discretionary accruals provide incremental predictive power over and above that provided by total accruals. Thus, the results of Subramanyam (1996), Al-Attar *et al*. (2008) and Farshadfar and Monem (2011) are consistent with the efficient view of earnings management in which the managerial discretion in accruals might help in improving the predictive ability of $EARN$ and ACC with respect to the $FCFO$.

Nam *et al.* (2012) conduct another US study to examine whether managers' motivation for discretionary accruals choices affects the ability of ACC to predict the $FCFO$ by employing out-of-sample prediction tests. They use a different regression model other than the models used by the previous studies, they regress the ACC contribution in predicting the $FCFO$ on discretionary accruals. They use the firm-specific version of the Jones (1991) model as modified by Dechow *et al*. (1995). The only difference between the modified Jones model and the original Jones model is that the change in revenues is adjusted for the change in receivables in the modified Jones model. Thus, in contrast to the original Jones model, the modified Jones model assumes that all changes in credit sales during a period are a result of earnings manipulation.

In contrast to Subramanyam (1996), Al-Attar *et al*. (2008) and Farshadfar and Monem (2011), Nam *et al*. (2012) find that the discretionary accruals do not add informational value to $EARN$ when predicting the $FCFO$. Their results show that discretionary accruals negatively affect the ability of ACC to predict the $FCFO$. Thus, this implies that the higher the magnitude of discretionary accruals, the lower the contribution of total ACC to predict the $FCFO$ which is most likely due to manipulation and opportunistic reasons.

Therefore, the findings of Nam *et al*. are consistent with the definitions of earnings management by Schipper (1989) and Healy and Wahlen (1999) and also by the concept of opportunistic earnings management because the results show that managerial discretion in accounting numbers might be detrimental to the predictive ability of ACC. However, the results of Subramanyam (1996) and Nam *et al*. (2012) are inconsistent with each other, although both are conducted on the US firms; this might be due to using a different measure to calculate discretionary accruals or using different regression models to examine the effect of discretionary accruals when predicting the $FCFO$.

However, although all the previous studies differentiate between discretionary and non-discretionary accruals; they do not attempt to differentiate between managerial discretion in accruals that are motivated by opportunistic or efficient reasons. In practice, it is difficult to distinguish between these two reasons. Nevertheless, Badertscher *et al*. (2012) fill in this gap by analyzing how efficient and opportunistic motives can affect the predictive ability of ACC through examining 238 US firms over the period 1997 to 2002.

Their sample includes firms that have announced restatements because of fraud, accounting irregularities, misapplication of the GAAP or errors that resulted in the correction of the previously disclosed financial statements. Then, they get the difference between originally reported and restated accrual components to specify the discretionary portion of accruals. Then, they classify the firms into two types according to their motives behind the discretionary accruals whether efficient or opportunistic. Firms that meet or beat analyst forecasts are classified as managing earnings for opportunistic reasons. They find that the initially reported (i.e., misstated) accruals of these firms are less positively associated with the one-period-ahead CFO than the restated accruals. However, the firms that did not meet or beat analyst forecasts, which are classified as managing earnings in an efficient way, initially reported accruals are more positively associated with the one-period-ahead CFO than restated accruals. They argue that this method of identifying discretionary accruals is better than modified Jones model as it can differentiate between the opportunistic and efficient motives behind discretionary accruals. Therefore, their results show that discretionary accruals could have either a positive or negative effect on cash flow prediction accuracy according to managers' intent.

To sum up, Subramanyam (1996), Al-Attar *et al*. (2008), Farshadfar and Monem (2011), Nam *et al*. (2012) and Badertscher *et al*. (2012) find that managers' discretion in estimating accruals either in good faith or with manipulation intent can affect the ability of $EARN$ and ACC positively or negatively when predicting the $FCFO$. However, it is apparent from the literature review that there are only few studies that test the effect of discretionary accruals on the predictive ability of $EARN$ and ACC.

This, in turn, leads to interesting research opportunities due to the following reasons. First, the results of these few studies are inconclusive and thus more studies are required to gain better understanding about the effect of discretionary accruals on the predictive ability of $EARN$ and ACC. Second, given the argument of Bartov *et al*. (2001) that the extent of managers' discretion differs across countries, it is expected that the results of the few studies conducted on the developed countries of US or Europe cannot be generalized to other countries, especially developing countries.

Thus, in an attempt to seize these research opportunities, this thesis aims to shed light on whether discretionary accruals have an impact on the abilities of $EARN$ and ACC to predict the $FCFO$ in the MENA region to provide an out-of-sample test of previous results since the MENA region provides a different context to test the predictive abilities of $EARN$ and ACC compared to that in the US or Europe. Leuz *et al*. (2003) provide evidence based on a cross-country analysis that firms in countries with weak investor protection and less-developed stock markets, similar to the MENA region countries, engage more in earnings management.

The MENA region firms have implemented a series of accounting reforms during the past several years which aim to enhance the quality of accounting information. However, managers' intent to manipulate financial reports through earnings management practice still exists, since these management practices are legal and within the flexibility allowed by their accounting standards (Amar and Abaoub, 2010; Amin and Amin, 2015; Bassiouny, 2016). Moreover, the imperfection of auditing and corporate governance practices especially in the MENA region firms creates opportunities for managers to use judgments and estimates to manipulate their companies' earnings in an opportunistic way (Abbadi, Hijazi and Al-Rahahleh, 2016; Alzoubi, 2016; Bassiouny, 2016). Therefore, it can be deduced that there is a significant earnings manipulation in the MENA region, and that companies in these countries may suffer from a higher level of opportunistic discretionary accruals which might negatively affect the predictive ability of $EARN$ and ACC. Therefore, the hypothesis based on the extant literature is as follows:

H5: Discretionary accruals in accounting have a negative impact on the abilities of $EARN$ and ACC to predict the one-year-ahead CFO.

3.2.3.2 Real Activities-Based Earnings Management

Another earnings management technique investigated in literature is real activities-based earnings management. A number of studies discusses the possibility that managerial intervention in the reporting process can happen not only through accounting discretion, but it can also be via operational business decisions. For example, offering price discounts to temporarily boost sales revenues, overproducing to lower COGS, cutting discretionary expenses aggressively such as R&D, advertising or maintenance to meet earnings targets are examples of earnings management techniques available to managers (Healy and Wahlen, 1999; Dechow and Skinner, 2000; Roychowdhury, 2006; Abernathy *et al*., 2014). These activities create what is called real activities-based earnings management or real activities manipulation.

Historically, the conventional way executives usually use to manage earnings is by discretionary accruals with no direct cash flow consequences (Roychowdhury, 2004). Roychowdhury argues that discretionary accruals are a convenient form of earnings management because it has no direct cash flow implications and can be done at the end of the fiscal year when managers are better informed about pre-managed earnings. However, managers also have incentives to manipulate real operational activities during the year with the specific objective of meeting specific earnings targets. Thus, firms have switched from discretionary accruals in managing earnings to real activities manipulation over the last two decades (Zang, 2012). Zang argues that real activities manipulation is a costly practice but it is harder to be detected than discretionary accruals. A survey done by Graham, Harvey and Rajgopal (2005) shows that 80% of chief financial officers surveyed report that they would engage in real activities-based earnings management through decreasing discretionary spending on R&D, advertising and maintenance to achieve earnings goals.

Therefore, a common definition that best describes real activities-based earnings management by Roychowdhury (2006, p.92) is "management actions that deviate from normal business practices, undertaken with the primary objective of meeting certain earnings thresholds." Further, Cohen and Zarowin (2010) and Zang (2012) provide a comprehensive explanation of real activities manipulation which is similar to the definition provided by Roychowdhury (2006) but both studies agree that these activities have direct cash flow consequences. Cohen and Zarowin (2010) explain real activities manipulation as actions managers take that deviate from standard business practices which have cash flow consequences. Further, Zang (2012) explains this type of earnings management as purposeful action taken to change reported earnings in a specific direction through changing the structuring or timing of investment, operation, or financing transactions, which has direct cash flow effect.

To sum up, the real activities manipulation is not considered as regular business practices because these activities would be implemented only with the aim of acheiving certain earnings thresholds and eventually these activities have cash flow consequences. Thus, these activities are consistent with the definition of earnings management presented by Schipper (1989) and Healy and Wahlen (1999), in which they agree that these real activities-based earnings management are designed to achieve private gain by reaching a predetermined earnings target which reflects the concept of the opportunistic rather than efficient earnings management.

Although real activities-based earnings management has cash flow consequences; only few studies have examined the effect of these activities on the ability of $EARN$ and its components in predicting the $FCFO$, such as Li (2019) who examines the impact of only one form of the real activities manipulation (i.e., cutting discretionary expenditures) on the predictive ability of $EARN$. However, real activities manipulation can appear in many forms such as sales manipulation and overproduction strategy (Roychowdhury 2004; 2006).

All of the previous studies, except Li (2019), that test how earnings management may affect cash flow prediction accuracy, focus mainly on the effect of discretionary accruals on the performance of cash flow prediction models. Although there is no prior research that links the three techniques of the real activities-based earnings management and cash flow prediction accuracy, it is expected that this relation is worth analysing. Therefore, the focus of this study is to fill in this research gap by examing the effect of the three real activities manipulation on the predictive abilities of $EARN$, CFO and ACC.

Roychowdhury (2004; 2006) provide a comprehensive explanation of the three main practices of real activities-based earnings management. First way of real activities earnings management is the sales manipulation. This happens when the firms offer sales discounts and more lenient credit terms in order to increase sales volume, this will result in boosting current earnings to meet the short-term target. Such sales discounts and lenient credit terms may temporarily increase sales volume, but this increase is likely to disappear once the firm reverts to the old prices. These sales discounts and more lenient credit terms affect both CFO and ACC. On the one hand, sales discounts and more lenient credit terms may result in lower CFO in the current period after controlling for sales level. On the other hand, if the firm generates additional credit sales with its modified terms, thus a higher amount than usual of these credit sales is outstanding at the end of the year, then the firm should exhibit an abnormal growth in receivables for a given increase in sales.

Therefore, earnings and its both components in this case are not reflecting the firm's actual performance during an accounting period. Thus, the abnormal $EARN$ in the current period tend to be misleading in predicting future cash flows in the next periods. In sum, the real activities manipulation can affect both CFO and ACC when predicting the $FCFO$.

Overproduction is the second way of the real activities manipulation. In this regard, managers of manufacturing firms may tend to produce more goods above their expectations of demand to manage earnings upward (Roychowdhur, 2004; 2006). Higher level of production can result in lower fixed costs per unit by spreading the total fixed overhead costs over a large number of units. As long as the reduction in fixed costs per unit is not offset by an increase in marginal cost per unit, the average cost per unit and the COGS decline. Thus, firms report better operating margins. However the firm incurs variable costs on the over-produced units which are not recovered in the same period through sales. As a result, CFO is lower than its normal level at the end of the year given sales levels.

Further, they also argue that the firms that apply the overproduction strategy have a higher amount of inventories than normal at the end of the year. Therefore, managers most probably engage in overproduction only if the decrease in the production costs offsets the increase in inventory holding costs in the current period. The higher inventories at the end of the year mean that the effect of overproduction on accruals is positive. Therefore, firms, which engage in overproduction strategy, have their CFO and inventory not in their normal levels. this may, in turn, lead to distortions in the reported accounting numbers making them losing their predictive usefulness.

The opportunistic reduction or deceleration of discretionary expenses such as R&D, advertising and maintenance expenses is the third way of real activities manipulation stated by Roychowdhury (2004; 2006). They argue that these expenses are generally expensed in the same period in which they are incurred. Hence, firms can reduce reported expenses, and increase earnings, by reducing discretionary expenditures. This is most likely to occur when such expenditures do not generate immediate revenues and income. If managers reduce discretionary expenditures to meet earnings targets, they should exhibit an unusual decrease in discretionary expense which includes items such as staff training, maintenance, new product innovation, and business development (Roychowdhury, 2006; Zhang, 2008).

If these expenses are generally in the form of cash, reducing these expenses may lead to higher cash flows in the current period but it may result in lower cash flows in the future (Roychowdhury, 2006; Cohen, Dey and Lys, 2008). However, if some of these expenses are incurred on account and are outstanding at the end of the year, then a decrease in these expenses towards the year-end should lower accounts payable below its normal level and lead to positive abnormal accruals (Roychowdhury, 2004). Therefore, decreasing discretionary expenses may lead to an abnormal and unrealistic increase in $EARN$, CFO and ACC which most likely results in misleading indication when predicting the $FCFO$.

Li (2019) is one of the first studies that examines the impact of the abnormal reduction in discretionary expenditures on two important aspects of earnings quality: earnings persistence and its ability to predict the $FCFO$ in a large sample of US firms from 1975 to 2016. This study is considered among the first attempts to investigate the effect of one of the real activities manipulation on the predictive ability of $EARN$, however it does not examine the impact of the other two techniques of real earnings management. In contrast, this thesis provides a comprehensive study of the impact of the three real earnings management activities on the predictive ability of $EARN$ and its components.

First, Li (2019) examines the impact of abnormal reduction in discretionary expenditures on earnings persistence. She argues that if firms manage earnings, either through real earnings management or discretionary accruals, to smooth earnings or signal firms' future performance, then earnings persistence would increase. In contrast, if firms manage earnings to temporarily increase reported earnings, current period earnings could become less persistent. She finds that when real earnings management is measured through cutting discretionary expenditures, the persistence of current earnings decreases. Thus, this result indicates that firms that reduce R&D, advertising and maintenance expenses are more likely to boost current reported earnings opportunistically rather than to smooth earnings or signal firms' future performance.

Further, Li (2019) focuses on whether reduction of the discretionary expenditures affects the ability of $EARN$ to predict the $FCFO$. She argues that highly persistent $EARN$ should be more informative about future cash flows. Since real earnings management through the abnormal reduction in discretionary expenses reduces earnings persistence, it may affect the association between current $EARN$ and future cash flows. Consistent with this notion, her results show that the abnormal reduction in discretionary expenses significantly decreases the ability of current $EARN$ to predict the one-year-ahead CFO.

In addition, the results of Li (2019) show that the impact of abnormal reduction in discretionary expenditures on $EARN$ persistence and its predictive ability largely comes from its negative impact on the persistence of CFO rather than ACC. However, extant research in earnings management largely focuses on discretionary accruals, implicitly assuming cash flows is free from manipulation (e.g., Barth *et al*., 2001). These findings suggest that real earnings management through the abnormal reduction in discretionary expenses negatively reduces the quality of CFO, and that such effect, in turn, reduces the persistence and predictive ability of current $EARN$. Thus, both accruals and cash flows are subject to manipulation and hence examining the impact of both earnings management techniques on the predictive ability of $EARN$ and its components in this thesis provides deeper understanding of factors affecting cash flow prediction accuracy.

To sum up, earnings management can go beyond affecting accruals only, because real activities manipulation can affect both cash flows and accruals. Historically, cash receipts and payments are typically considered as an objective activity whereas cash transfers are usually recorded as they occur (Basu, 1997). Thus, CFO is always perceived to be more objective and less vulnerable to management manipulation (DeFond and Hung, 2003). However, manipulation of real activities affects CFO as a part of reported accounting earnings (Roychowdhury, 2004; Li, 2019). Therefore, real activities manipulation might affect the ability of $EARN$ in total, and also CFO in predicting the $FCFO$.

Thus, real activities manipulation might have a greater effect on cash flow prediction accuracy more than discretionary accruals. Real activities manipulation might affect the predictive ability of both CFO and ACC while discretionary accruals can affect the predictive ability of ACC only. Therefore, this thesis sheds light on whether real activities manipulation affects the predictive abilities of $EARN$, CFO and ACC with respect to the one-year-ahead CFO in MENA region.

H6: Real activities manipulation has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.

3.2.3.3 Classification Shifting-Based Earnings Management

A third technique of earnings management addressed in accounting literature is classification shifting. Classification shifting is an earnings management technique in which core expenses such as COGS, general and administrative expenses are shifted to specific items section in the income statement (McVay, 2006). Barua, Lin and Sbaraglia (2010) and Cameron and Gallery (2012) argue that if the managers have the objective to achieve higher core earnings, they can shift core expenses to extraordinary items or discontinued operations. McVay (2006) argues that this vertical movement of expense does not change bottom-line net income, but overstates the net income before extraordinary items and discontinued operations (i.e., core earnings). Since, the core earnings is always used to predict future cash flows, thus shifting core expenses to special items results in artificially increased core earnings that will not persist into the future making $EARN$ lose its ability to predict future cash flows.

Although classification shifting earnings management might affect the ability of $EARN$ in predicting the $FCFO$, it is not empirically tested in this thesis because extraordinary items and discontinued operations are not usually disclosed in the financial statements of the MENA region firms. In addition, extraordinary item reporting is prohibited under the IFRS (Kieso *et al*., 2010), and most of the companies included in this thesis are IFRS-oriented. Thus, since classification shifting earnings management can't be measured in the MENA region, analysing its impact on the predictive ability of $EARN$ is left for future research especially in countries that use this technique of earnings management.

3.2.4 Unintentional Managerial Errors

As long as discretionary accruals and real activities manipulation can affect cash flow prediction process, it is also expected that unintentional managerial errors might have a similar effect. However, there is little direct evidence on this in the prior literature. Richardson *et al*. (2005) argue that errors do not always come from intentional earnings management. Managerial errors could also result from misapplication of GAAP (e.g., a one-off gain from LIFO inventory liquidation) and unintentional managerial errors (e.g., overestimating the creditworthiness of a new customer, or overestimating the future sales price of work-in-process inventory).

Although most studies assume that intentional managerial errors have the dominant impact on earnings quality, these intended accounting manipulation errors are unobservable and happen only occasionally rather than on a regular basis, for example, before stock offerings or to meet analysts' earnings predictions (Dechow and Dichev, 2002; Taylor and Xu, 2010). In contrast, Dechow and Dichev (2002) argue that earnings (and accruals) quality might be related to observable and recurring firm characteristics such as firm size, operating cycle length, the amount of accruals, operational volatility (volatility of sales, cash flow and earnings), and the frequency of reporting negative earnings.

Dechow and Dichev argue that smaller firms, longer operating cycles and larger amounts of accruals indicate greater uncertainty, more accruals estimation and greater errors of estimation. Further, they argue that higher operational volatility is associated with a higher probability of unavoidable accruals estimation errors. For example, managers who work in unstable and volatile industries and have good skills and intentions are expected to encounter larger accruals estimation errors. They also expect that losses may be an indication of severe negative shocks in the firm's operating environment. Thus, accruals made in response to such shocks probably include significant estimation errors, for example, when estimating restructuring charge that the company should incur to reorganize the operations of the business to improve the overall efficiency and longer-term profit. All of these firm characteristics reflect high uncertainty and high probability of using estimations that may result in high estimation errors and consequently lower earnings quality.

Consistent with their arguments, they find that quality of earnings is poorer for small-sized firms, and firms with the longer operating cycle, more volatile sales and cash flows, a high proportion of losses and larger amounts of accruals. They argue that such strong correlations suggest that these variables can be used as reliable instruments for earnings (and accruals) quality. Consistent with Dechow and Dichev, Francis *et al*. (2005) find that all the selected firm characteristics are significant in explaining accruals quality (all characteristics are negatively related to accruals quality, except the firm size is positively related).

Further, Francis *et al*. (2005) attempt to distinguish between poor accruals quality that is driven from innate characteristics of a firm's business model and changing operating environment (e.g., changing receivables turnover and exiting a line of business or geographic region) and poor accruals quality due to managers' judgment and discretion. They develop a new technique which partitions the Dechow and Dichev (2002) measure of accruals quality into two components: (i) component that measures the intentional manipulation of discretionary accruals; and (ii) component that measures unintentional estimation errors arising from the uncertainty in the operating environment. The innate component of accruals quality is based on the firm- specific characteristics (namely firm size, volatility of CFO, volatility of sales, firm's operating cycle length and frequency of negative earnings realizations). Thus, all of these characteristics jointly are used as a proxy for unintentional managerial errors.

As opposed to simply examining the discretionary accruals as the only source of accruals estimation error, they examine the separate effects of innate accruals and discretionary accruals on the quality of accruals. They find a significant negative relationship between innate accruals and accruals quality, whereas they find a significant positive relationship between discretionary accruals and accruals quality. The reason behind the positive relationship may be due to managers' usage of discretionary accruals to reflect their private information rather than opportunistic reasons to manipulate. Therefore, it is obvious that unintentional managerial errors usually have a negative effect on accruals quality, while discretionary accruals might have a positive or negative effect on accruals quality.

Therefore, as discussed earlier, the amount of estimation error is probably related to managerial skills and managerial opportunism. As the predictive abilities of $EARN$ and ACC are affected by managers' moves towards manipulating accounting numbers, it is also expected that the predictive abilities of both of them are affected by unintentional managerial errors. Therefore, the hypothesis based on the extant literature is as follows:

H7: Unintentional managerial errors in estimating accruals have negative impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.

In sum, a proxy for unintentional managerial errors calculated from the firm-specific characteristics suggested by Dechow and Dichev (2002) and Francis *et al*. (2005) is expected to have an impact on the predictive abilities of $EARN$ and ACC. In addition, this thesis also aims to test the unique impact of each firm-specific characteristic which are firm size, volatility of CFO, volatility of sales, firm's operating cycle length and frequency of negative earnings realizations on the predictive ability of $EARN$ and its components to provide a clearer picture on the effect of each of these variables. The next section aims to provide an overview on the aforementioned firm-specific characteristics and their relationship with the predictive ability of $EARN$ and its components.

3.2.4.1 Firm-Specific Characteristics

The literature highlights a wide variety of firm-specific characteristics such as firm size, CFO volatility, sales volatility, operating cycle length and firm profitability that can impact the performance of the cash flow prediction models. Initially, Dechow and Dichev (2002) test the relationship between each of these firm-specific characteristics and the quality of earnings, then Francis *et al.* (2005) test the joint impact of these variables altogether on the quality of earnings and highlight that these variables can be used as a proxy for unintentional managerial errors when assessing earnings (and accruals) quality. Interestingly, Kim and Kross (2005), Lorek and Willinger (2009), and Habib (2010) also find that these characteristics affect the ability of $EARN$ and its components, CFO and ACC, to predict the $FCFO$.

The first firm characteristic affecting cash flow prediction model is the firm size. Kim and Kross (2005), Lorek and Willinger (2009) and Arnedo *et al*. (2012) argue that large firms are charactized by being more mature and diverisfied than small firms. Furthermore, large firms are presumed to have slower or stable growth rates, more stable cash flows and predictable operation compared to their small counterparts. In contrast, they argue that small firms are more vulnerable to losses than large firms and they may include start-up companies whose value depends on future growth potential. Consequently, they argue that the stability of large firms is expected to lead to higher earnings persistence and more predictable $FCFO$ than small ones.

Consistent with the above argument, Cheng and Hollie (2008), Farshadfar *et al*. (2008), Lorek and Willinger (2009; 2010) and Habib (2010) find that cash flow prediction models are more accurate in large firms compared to small firms. In contrast, Kim and Kross

(2005) find that firm size does not appear to exert a strong influence on cash flow prediction models. They find the predictive ability of $EARN$ is increasing over the time in small or large firms.

Moreover, Arnedo *et al*. (2012) find that ACC has a significantly greater ability to predict the $FCFO$ for larger firms than smaller ones. In contrast, Nam *et al*. (2012) find that ACC contributes more in improving the $FCFO$ predictions for smaller firms. Further, Farshadfar and Monem (2013b) find that the predictive ability of both aggregated and disaggregated CFO increases with firm size. Therefore, despite the inconsistency in the results, the findings of Cheng and Hollie (2008), Farshadfar *et al*. (2008), Lorek and Willinger (2009; 2010), Habib (2010), Arnedo *et al*. (2012) and Farshadfar and Monem (2013) can be taken as an evidence that cash flow predictions of larger firms are more accurate than those of smaller firms. Taken all together, it is expected that the predictive abilities of $EARN$, CFO and ACC are lower in the small-sized firms in the MENA region. This lead to the following hypothesis of this thesis, which is:

H8: Firm size has a positive impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.

The second firm characteristic affecting cash flow prediction model is the volatility of CFO. If companies are operating in an uncertain environment, the stream of their CFO is more likely to exhibit greater volatility (Nam *et al*., 2012). As a result, Habib (2010) argue that prediction of the $FCFO$ becomes difficult for companies exhibiting volatile cash flows, because such cash flows is likely to be less persistent and less predictable. The results of

Habib provide an empirical support for this argument as they show that the predictive abilities of $EARN$ and CFO is lower in firms with a greater CFO volatility.

However, despite this decrease in the predictive abilities of $EARN$ and CFO when cash flow volatility is high, Nam *et al.* (2012) argue that in such cases ACC tends to smooth out some of the volatility in the cash flow series by mitigating issues arising from the timing and matching problems inherent in CFO (Dechow, 1994; Al-Attar and Hussain, 2004). Thus, this leads users of financial statements tend to depend more on ACC when they draw inferences about the timing and amount of $FCFO$. Supporting this argument, Nam *et al*. (2012) and Arnedo *et al*. (2012) find that the more volatile the CFO is, the greater the improvement of ACC upon the current CFO in predicting the $FCFO$.

Therefore, given the above argument, it is expected that the higher volatility of the CFO, the lower the predictive abilities of $EARN$ and CFO. In contrast, ACC should be more helpful in predicting the $FCFO$ when current CFO is more volatile. Consequently, this leads to the following two hypotheses, which are:

H9: Cash flow volatility has a negative impact on the abilities of current $EARN$ and CFO to predict the one-year-ahead CFO.

H10: Cash flow volatility has a positive impact on the ability of current ACC to predict the one-year-ahead CFO.

The third firm characteristic affecting cash flow prediction models is sales volatility. Similar to CFO volatility, sales volatility also reflects a volatile operating environment and the likelihood of greater use of estimation, with corresponding large errors of estimation and lower accruals quality (Dechow and Dichev, 2002; Francis *et al*., 2005). In response, Yoder (2007) finds that the ability of ACC to predict the $FCFO$ decreases as sales volatility increases. Since the predictive ability of $EARN$ is attributable to ACC, thus any systematic change in the properties of ACC could alter the predictive ability of $EARN$ and its components. Therefore, it seems that the volatility of sales might negatively affect the ability of $EARN$ and its components to predict future cash flows. This leads to the next hypothesis of this thesis, which is:

H11: Sales volatility has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.

The fourth firm characteristic is the operating cycle length. Dechow (1994) argues that operating cycle length is an implicit variable in explaining variation in earnings and cash flows. Moreover, Dechow and Dichev (2002) argue that longer operating cycles indicate more uncertainty in the operating environment. In particular, Barth *et al*. (2001) find that the relative ability of $EARN$ and its components to explain the $FCFO$ decreases as the length of the operating cycle increases. Further, Lorek and Willinger (2009) and Habib (2010) find that $EARN$ and CFO perdition models have smaller out-of-sample prediction errors of the $FCFO$ for firms with shorter operating cycle. Following these results, it is expected that firms with longer operating cycle, the lower the predictive ability of $EARN$ and its components. This leads to the following hypothesis:

H12: Operating cycle length has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.

The fifth firm characteristic affecting cash flow prediction model is firm profitability. Farshadfar and Monem (2013b) find that cash flow prediction models are affected by whether the firm has realized profits or losses. Losses are an indication of severe negative shocks in the firm's operating environment (Dechow and Dichev, 2002). Therefore, Dechow and Dichev argue that accruals made in response to such shocks probably include substantial estimation errors. Thus, the predictive ability of these estimated accruals is expected to be lower in case of such shocks and this consequently might affect the predictive ability of $EARN$ in general. Consistent with this argument, Farshadfar and Monem (2013b) find that $EARN$ is poor predictor in firms with realized losses. This leads to the following hypothesis:

H13: Greater frequency of reporting negative earnings has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.

Therefore, the above studies show that cash flow prediction models are to a great extent affected by the firm size, CFO volatility, sales volatility, operating cycle length, and frequency of reporting negative earnings. Therefore, this indicates that the firm-specific characteristics, suggested by Dechow and Dichev (2002) as a measure for earnings quality, should also be considered as factors affecting the predictive ability of $EARN$ and its components. After reviewing the intentional earnings management and unintentional managerial errors in estimating accruals and how they can affect the predictive ability of $EARN$ and its components, this chapter shifts to discussing accounting conservatism which is an accounting mechanism that can offset these managerial errors and enhance the performance of cash flow prediction models.

3.3 Accounting Conservatism

Conservatism has been a central accounting principle for centuries, and in the last 40 years the focus on this concept has been increasing. The FASB (1980, p.24) defines accounting conservatism as a "prudent reaction to uncertainty to try to ensure that uncertainties and risks inherent in business situations are adequately considered." Further, Basu (1997, p.4) states that conservatism has influenced accounting practices for many years and defines conservatism as "the accountant's tendency to require a higher degree of verification to recognize good news or positive economic performance as gains than to recognize bad news or negative economic performance as losses." These definitions are consistent with the traditional conservatism adage "anticipate no profits but anticipate all losses."

Another general interpretation of accounting conservatism is articulated by the IASB (1989) and states that in preparing financial statements, accountants have to deal with the uncertainties that unavoidably surround many circumstances and events, such as the collection of doubtful receivables, the expected useful life of PPE and the number of warranty claims that may happen. The IASB states that such uncertainties can be limited through the exercise of prudence when preparing the financial statements. Thus, accounting conservatism under the IASB is known by prudence which is defined as exercising a degree of caution in the judgments and estimates in the case of uncertain conditions, such that income and assets are not overstated, and expense and liabilities are not understated.

Thus, accounting conservatism is initiated to limit managerial opportunism behaviour and also offset managerial biases through the verification process of accounting numbers (Watts, 2003). Further, Watts suggests that conservatism is a way to address agency problems stemming from information asymmetries between managers and shareholders. For example, the asymmetric verification requirements for unrealized gains versus losses minimize the managers' ability to artificially inflate earnings and be over-compensated under accounting-based compensation plans, which in turn, reduces the agency problems (Watts, 2003; Khan and Watts, 2009). Thus, accounting conservatism is a way to protect investors and creditors from managerial opportunism. This is consistent with the findings of the recent US study by Lara, Osma and Penalva (2020) which provides empirical evidence that more conservative firms have a lower probability of managing earnings through discretionary accruals or real earnings management to meet or marginally beat earnings benchmarks. Their results show that conservatism enhances the firm information environment by reducing earnings management.

Therefore, in the past several decades, the FASB issues standards on assets and earnings valuation that make financial reporting in the US setting more conservative in recent years (Givoly and Hyan, 2000; Watts, 2003; Lara *et al*., 2020). These standards include FAS 106, Employer's Accounting for Postretirement Benefits Other Than Pensions, FAS 114, Accounting by Creditors for Impairment of a Loan, and FAS 121, Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed. There are two main types of accounting conservatism that are used in practice which are explained in the following subsection.

3.3.1 Types of Accounting Conservatism

The literature identifies two main types of accounting conservatism. Although, the terminologies across studies are inconsistent, the two types of accounting conservatism are commonly known as conditional and unconditional conservatism. Conditional conservatism attracts the focus of researchers more than unconditional conservatism. Conditional conservatism requires a higher degree of verification for positive economic news than for negative economic news (Pae, Thornton and Welker, 2005; Qiang, 2007; Ruch and Taylor, 2014). Thus, this implies that the accounting system under conditional conservatism recognizes bad news (losses) on a timelier basis than good news (gains), which is consistent with the definition of Basu (1997). As alternatively stated by Watts (2006), there is nothing in a conservative accounting system that requires delaying the recognition of verifiable gains, or verifiable or unverifiable losses, rather it requires further verification before recognising unverifiable gains and that are therefore the defining feature of conditional conservatism.

Therefore, typical examples of conditional conservatism include the lower of cost or net realizable values for inventories, the recognition of impairment losses on tangible and intangible assets, and the asymmetric recognition of contingent losses and contingent gains (Beaver and Ryan, 2005; Pae *et al*., 2005). Generally, these accounting principles require write-downs to recognize bad news regarding inventory, tangible and intangible assets, and loss contingencies but prohibit write-ups to recognize good news (Beaver and Ryan, 2005; Pae *et al*., 2005).

The second type is known as unconditional conservatism. Unconditional conservatism results from the application of accounting policies that reduces earnings regardless of current economic news (Pae *et al*., 2005). Therefore, this type biases income and assets downward even before information verification has occurred (Qiang, 2007). Thus, Qiang argues that unconditional conservatism immunizes accounting practices against future negative economic news. Typical examples of unconditional conservatism include accelerated depreciation methods, the immediate expensing of R&D costs related to internally developed intangibles (e.g. patent), even if they are associated with positive expected future cash flows (Beaver and Ryan, 2005; Pae *et al*., 2005).

Therefore, the main difference between the two types of accounting conservatism is that the application of conditional conservatism is based on economic news, while the application of unconditional conservatism is not. Given the two types of accounting conservatism, it is essential to analyze the impact of using each of these methods on the reported accounting information as this facilitates understanding how accounting conservatism can affect cash flow prediction process.

3.3.2 Accounting Conservatism versus Accounting Quality

Since there is no consensus on the definition of accounting conservatism, accounting scholars also have contradictory arguments about the impact of accounting conservatism on accounting information quality (e.g., earnings quality and financial disclosure quality). On the one hand, accounting conservatism would constraint managerial opportunistic behaviour as well as facilitates efficient corporate governance process (Watts, 2003; Iatridis, 2011). Thus, practice of conservatism in accounting is an efficient financial reporting mechanism that creates high quality accounting information (Ball, 2006; Watts, 2006). On the other hand, conservatism in accounting results in a downward bias in the reported book values of the company because conservatism defers the recognition of economic gains but accelerates the recognition of economic losses (Basu, 1997). In this case, accounting conservatism might produce distortions to accounting numbers (Penman and Zhang, 2002; Chen, Folsom, Paek and Sami, 2014).

These contradictory arguments show that accounting conservatism remains as a controversial issue in accounting literature. Part of the controversy surrounding accounting conservatism and its role in the financial reporting process comes from the different meanings and applications of conditional and unconditional conservatism (Mora and Walker, 2015). Conditional conservatism is news-dependent, while unconditional conservatism is news-independent in which the accounting system always creates a downward bias to book values and earnings, irrespective of whether there is good news or bad news.

Given these contradictory views and definitions of conservatism, the impact of conservatism on earnings quality is also one of the debatable areas in accounting literature. Chen *et al.* (2014) argue that conditional conservatism may have a negative impact on earnings quality. Specifically, they highlight that since conditional conservatism leads to more timely recognition of bad news this can lead to a reduction in earnings persistence which is an indicator of earnings quality as this cannot be offset by the increases in earnings persistence from less timely recognition of good new events. In contrast, they argue that since unconditional conservatism is frequently implemented regardless of the news, its application may be predictable and correlated through time which may cause earnings to be more persistent. Based on these arguments, they expect conditional conservative results in less earnings persistence compared to unconditional conservative.

To test these arguments empirically, Chen *et al.* (2014) use a sample of US firms over a period from 1988 to 2010 and they find that higher accounting conservatism results in lower earnings persistence. Therefore, accounting conservatism, in general, produces less persistent earnings that mislead financial statement users to evaluate sustainable or recurring components of earnings in their valuation decisions. In addition, consistent with their argument, they find that conditionally conservative earnings is less persistent than unconditionally conservative earnings. This means that conditional conservatism might affect earnings quality negatively more than unconditional conservatism.

In contrast to Chen *et al*. argument, Iatridis (2011) argue that firms that apply conditional conservatism are expected to have high accounting quality in their reported disclosures. Conditional conservatism provides shareholders, creditors and other stakeholders with verifiable information about unfavourable financial events that are depicted on the financial statements. For example, conditional conservatism is prevalent in the case of asset impairment. Specifically, the IAS 36 states that any asset should be impaired when its carrying amount is more than its recoverable amount. Thus, conditional conservatism reinforces the value relevance and information usefulness of the reported accounting numbers.

Moreover, Penman and Zhang (2002) argue that unconditional conservatism practices can lead to reduction in earnings that creates an accumulation of unrecorded reserves that provide managers with the flexibility to report more earnings in the future. Consequently, when these unrecorded reserves are released into future earnings, this might lead to a temporary distortion of operating performance. Thus, firms that apply unconditional conservatism practices are more likely to have low quality accounting disclosures, especially when subjectivity drives their decisions (Iatridis, 2011). Thus, unconditional conservatism can create opportunities for earnings management (Mora and Walker, 2015). Consistent with the previous argument, Iatridis (2011) finds that the UK firms that provide high quality accounting disclosures apply conditional conservatism in their financial statements rather than unconditional conservatism to enhance the quality and usefulness of the reported accounting numbers, and increase investors' confidence in the management of the company.

To settle the previous controversy on whether accounting conservatism is an efficient financial reporting mechanism, the IASB (2008) in a discussion paper related to improving conceptual framework states that prudence and conservatism, either conditional or unconditional, are no longer desirable qualities of financial reporting information because it believes that conservatism biases accounting information. Moreover, accounting conservatism violates neutrality which is one of fundamental qualities under the Conceptual Framework. Thus, the IASB changed its view concerning accounting conservatism compared with the previous IASB framework, while this change is not surprising given that prudence is likely to bias the reported financial position and financial performance. The IASB states that the understatement of assets and income or overstatement of liabilities and expenses in one period frequently leads to overstating financial performance in later periods a result that cannot be described as prudent.

In 2010, the IASB has published another issue which also does not include conservatism or prudence in the Conceptual Framework because neither of them is considered as an aspect of faithful representation and including either would be inconsistent with neutrality. Although the IASB remove conservatism from its Conceptual Framework, there are decisions made implicitly by the IASB with respect to conservatism differ from the IASB's explicit conceptual position that IFRS should not require conservative accounting (Hellman, 2008; Barker and Mcgeachin, 2015; André *et al*., 2015). They argue that there are many standards that can implicitly induce conservative practices in financial reporting such as the lower of cost or net realizable values for inventories (IAS 2), the recognition of contingent liabilities versus the non-recognition of contingent assets (IAS 37), impairment for assets (IAS 36), or the capitalisation and impairment of development costs (IAS 38).

In May 2014, due to the demands of the public debt makers for conservatism (Mora and Walker, 2015), the IASB proposes to reintroduce the prudence concept in the coming Conceptual Framework in a way that respects the role of neutrality in the financial reporting. In contrast to the previous Conceptual Framework, the IASB states that neither the overstatement nor understatement of assets, liabilities, income or expenses is allowed. A few years later, the Conceptual Framework of IASB (2018) has officially reintroduced an explicit reference to the notion of prudence, a concept that was removed from the IASB (2010) Conceptual Framework. The IASB believes that prudence supports neutrality of information and therefore describes prudence as "the exercise of caution when making judgements under conditions of uncertainty''.

Despite all the above arguments of whether accounting conservatism is beneficial or costly to accounting data reported in financial statements, Givoly and Hyan (2000) and Watts (2003) provide evidence that accounting conservatism is a fundamental and pervasive phenomenon in the last several decades especially in the US firms. Therefore, future research should put greater emphasis on determining the effect of conditional and unconditional conservatism on future income and future cash flows. Watts (2003) argues that conservatism does not require all cash flows from revenues to be received before recognizing profits rather it emphasizes that the expected cash flows should be verified. This, in turn, might enhance the ability of $EARN$ to predict the $FCFO$. Further, Beaver and Ryan (2005) and Bandyopadhyay *et al*. (2010) argue that applying the accounting conservatism concept can lead current $EARN$ to reflect future cash flows in case of potentially adverse circumstances but not in the case of potentially favourable circumstances. Therefore, this issue needs further investigation to determine whether accounting conservatism enhances or deteriorates cash flow prediction accuracy.

3.3.3 Accounting Conservatism and Future Cash Flows

Although accounting conservatism and its effect on firms have been discussed widely in accounting literature and many studies emerged to test the relationship between conservatism and the quality of earnings, cost of debt, board of director characteristics, managerial ownership, and corporate governance, there is a significant dearth in studies that test the relationship between accounting conservatism and cash flow prediction process. Kim and Kross (2005) and Bandyopadhyay *et al*. (2010) are considered as the main seminal studies that serve as a basis for understanding the relationship between accounting conservatism and the ability of $EARN$ in predicting the $FCFO$.

Basu (1997) argues that conservative accounting requires bad news to be reflected immediately in the financial statements. Thus, Kim and Kross (2005) argue that if the bad news impacts the ability of the firm to generate future cash flows, then the immediate recognition of bad news can make financial statements more relevant for cash flow prediction process. Consequently, Kim and Kross examine 3,500 US firms over the period from 1973 to 2000 to investigate the effect of accounting conservatism on the ability of $EARN$ to predict the $FCFO$. They use the measure developed by Givoly and Hayn (2000) which is the level of accumulated non-operating accruals. Consistent with their argument, they find that the ability of current $EARN$ to predict $FCFO$ increases from 12.3% in (1973-1982) to 56.7 % in (1992-2000) in the firms that become more conservative in their financial reporting. However, the relationship between current $EARN$ and the $FCFO$ remains almost stable over time in firms that have stable or decreasing accounting conservatism over the sample period 1973 to 2000. Therefore, accounting conservatism plays an important role in enhancing the ability of $EARN$ to predict the $FCFO$.

Further, Bandyopadhyay *et al*. (2010) extend the work of Kim and Kross (2005) by examining the effect of accounting conservatism on the ability of $EARN$ to predict the $FCFO$. They use the level of accumulated non-operating accruals, consistent with Kim and Kross (2005). Moreover, they construct an accounting conservatism index consisting of non-operating accruals, earnings skewness, earnings volatility and market-to-book ratio. They argue that both measures of accounting conservatism used in their study capture the change in the degree of conditional and unconditional conservatism. The in-sample and out-of-sample tests are conducted for a sample of 97,332 US firm-year observations over the period 1973 to 2005. Consistent with Kim and Kross (2005), their in-sample and out-of-sample tests show that conservatism, either conditional and or unconditional, has a significant positive relationship with the ability of current $EARN$ to predict the $FCFO$.

Therefore, regardless of the controversial debate concerning accounting conservatism concept, Kim and Kross (2005) and Bandyopadhyay *et al*. (2010) find that accounting conservatism enhances the ability of $EARN$ to predict the $FCFO$. Nevertheless, Bandyopadhyay *et al*. find that $EARN$ is a poor predictor of future $EARN$ in conservative firms. Thus, The findings of Bandyopadhyay *et al*. (2010) contribute to the debate that pre-recognizing unrealized future expenses and losses which implicitly reflect accounting conservatism could improve the relationship between current $EARN$ and the $FCFO$ but at the cost of the ability of current $EARN$ to predict future $EARN$.

This result is consistent with Barth (2006) argument that including more estimates of the future in today's financial statements can lead to earnings that are less persistent. This, in turn, can negatively affect the ability of $EARN$ to predict future $EARN$. However, these future estimates can provide better information for making economic decisions and lead to superior predictions of future cash flows. Consequently, since financial reporting focuses more on the predictability of future cash flows compared to future earnings, depending on estimates of the future in preparing financial estimates can lead to superior predictions of future cash flows and achieve one of the main objectives of financial reporting.

Therefore, accounting conservatism is expected to enhance the predictive ability of $EARN$ generally and ACC specifically. Basu (1997) argue that accounting conservatism acts through accrual component of earnings. Since, the predictive ability of $EARN$ increases in the firms that are conservative in their accounting, thus, it is expected that the predictive ability of ACC increases as well. Thus, given the results of Kim and Kross (2005) and Bandyopadhyay *et al*. (2010) that conservatism enhances the ability of $EARN$ to predict the $FCFO$, this study aims to examine whether the predictive abilities of $EARN$ and ACC are enhanced by the conditional and unconditioanl accounting conservatism in the MENA region firms and the hypothesis is as follows:

H14: Conditional conservatism has a positive impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.

H15: Unconditional conservatism has a positive impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.

3.4 The Accounting Characteristics of MENA Region Countries

Although there are some studies that compare between the ability of $EARN$ and CFO in predicting the $FCFO$ in the MENA region firms (e.g., Telmoudi *et al*., 2010; Ebaid, 2011; Hammami, 2012), there are few or no studies that examine the factors that affect the ability of $EARN$ and its components when predicting the $FCFO$. Concerning earnings management and unintentional managerial errors, the majority of MENA region studies focus mainly on the relationship of earnings management with other variables rather than the performance of the cash flow prediction models. For example, the relationship between earnings management and other variables such as corporate governance, ownership structure, firm characteristics, and accounting standards and regulations. Moreover, most of these studies examine discretionary accruals as a proxy for earnings management while ignoring the other two types of earnings management.

In contrast, Elkalla (2017) finds that the IFRS adoption in the MENA region firms leads managers to engage more in real earnings manipulation rather than discretionary accruals. He suggests that rigorous accounting regulations lead to improving accounting quality which induces managers to switch to real earnings manipulation since discretionary accruals becomes more difficult to engage in. Therefore, it is expected that earnings management in one form or another is more pervasive in the MENA region firms.

Further, there is a public perception that managers of the MENA region countries are likely to practice earnings management opportunistically to maximize their own benefits rather than the stakeholders' benefits (Alareeni, 2018). This might be due to the weak regulatory environment embedded in these countries compared to the developed countries (Looney, 2005; Gill *et al.*, 2013; Kuo *et al*., 2014). Ball, Robin and Wu (2003) suggest that in weak regulatory environments, the financial reporting quality tends to be driven by managers' opportunistic incentives rather than the strength of the country's financial reporting standards.

Although the GCC countries follow the IFRS, Alareeni (2018) finds that firms in these countries (e.g., Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) are engaged in downward earnings management practices. This might be due to opportunistic reasons such as avoiding some political and social costs or avoiding employees' requests to raise wages and salaries. Moreover, Abbadi *et al*. (2016) and Khalil and Ozkan (2016) find that Jordanian and Egyptian companies, respectively, have not yet reached the phase of full compliance with the corporate governance mechanism. This, in turn, provides top managers in these countries with a greater power and a degree of discretion to manipulate earnings in a way that serves their interests.

However, the accounting standards become increasingly harmonized across countries all over the world, the accounting discretion could still differ between countries with different institutional structures even when accounting standards are identical (Cahan, Liu and Sun, 2008). Although the MENA region countries have accounting standards that are generally viewed as high-quality, they have institutional structures, such as weak corporate governance and regulatory environment, which give managers incentive to issue low-quality financial reports. Therefore, there are still doubts about the quality of earnings as a measure of firm performance in this region despite the mandating adoption of IFRS in most of the MENA region countries. Therefore, $EARN$ can be significantly manipulated and it is expected to be relatively poor measure of performance and, thereby, poor predictor of the $FCFO$.

Concerning accounting conservatism, its effect on firms has been discussed widely in the existing literature, with evidence from developed countries. However, there are almost no studies that examine the effect of accounting conservatism on the performance of the cash flow prediction models, especially in the MENA region firms. However, many studies show that companies in this region exhibit a reasonable level of accounting conservatism. Hamdan, Abzakh and Al-Ataibi (2011) assess the role of the public sector in regulating accounting standards in companies listed in Kuwait stock exchange and Bahrain stock exchange by investigating their ability to compel those companies to have a conservative reporting system. Their findings show that public sector of both countries succeeded in forcing companies to present a reasonable level of accounting conservatism when preparing financial statements. Recently, Alkurdi, AlNimer and Dabaghia (2017) investigate the impact of ownership structure on the level of accounting conservatism in Jordan. They find that Jordanian companies become more conservative in their financial accounting.

Khalifa, Othman and Hussainey (2016) analyse differences in accounting conservatism levels across developing countries in America, Asia, East Europe, and MENA/Africa region over the period between 2000 and 2012. They find that countries from Eastern Europe are more conservative, followed by Asian countries and MENA/African firms. However, firms from American region produce non-conservative financial statements. Houcine (2013) and Nasr and Ntim (2018) examine the relationship between accounting conservatism and other variables in Tunisia and Egypt, respectively. They find that Tunisian and Egyptian companies tend to have a lower degree of accounting conservatism in their financial reporting compared to that reported in the US companies. This is not a surprising result as both studies argue that Tunisia and Egypt are countries with weak investor protection and governance structure that expectedly would not have high levels of accounting conservatism compared to the developed countries (e.g., US).

Therefore, the level of accounting conservatism across the MENA region firms might be changeable from one country to another, but it would not be as high as the US companies. However, some companies in the MENA region tend to be conservative in their reporting to compensate for the weak governance structure (Nasr and Ntim, 2018). This study aims to extend the work of Kim and Kross (2005) and Bandyopadhyay *et al*. (2010) by examining how these cross-sectional differences in the level of accounting conservatism among various developing countries in the MENA region can affect the abilities of $EARN$ and ACC in predicting the one-year-ahead CFO.

3.5 Conclusion

This chapter shed some light on the factors that affect the ability of $EARN$ and its components to predict the $FCFO$. While there have been considerable studies examining which from $EARN$ and its components has the superior ability to predict the $FCFO$ (e.g., Dechow *et al*., 1998; Barth *et al*., 2001; Kim and Kross, 2005; Farshadfar *et al*., 2008; Lorek and Willinger, 2009; Lev *et al*., 2010), to date, there are few studies that have focused on factors affecting cash flow prediction accuracy, especially in the MENA region. Therefore, one of the objectives of this thesis is to fill this gap by exploring some of the fundamental factors, which are earnings management, unintentional managerial errors and accounting conservatism, that might affect the three main elements of cash flow prediction models which are $EARN$, CFO and ACC.

Although the FASB and the IASB emphasize the role of accrual-based earnings in helping investors to predict the $FCFO$, earnings management and unintentional managerial errors in accounting estimates can decrease the usefulness of $EARN$ and its components in predicting the $FCFO$. Thus, intentional earnings management is not the only source of biases in earnings. Unintentional managerial errors in estimating accruals due to the difficulty of predicting an uncertain future are shown to be an important source of errors in earnings (Dechow and Dichev, 2002; Francis *et al.*, 2005). Given that both sources of accruals estimation error have negative consequences on financial reporting quality, it is important to understand how both can affect the ability of $EARN$ and its components in predicting the one-year-ahead CFO.

Earnings management can be done through various methods: (i) discretionary accruals by changing estimates and accounting policies; and (ii) real activities manipulation which has direct cash flow consequences. Therefore, earnings can go beyond affecting accruals only, because real activities manipulation can affect both cash flows and accruals. Thus, this thesis examines how earnings management (which are represented by discretionary accruals and real activities manipulation) and unintentional managerial errors affect the predictive abilities of $EARN$, CFO and ACC.

Accounting Conservatism has been a central accounting principle for centuries and appears to have increased in the last 40 years. IASB (1989) defines accounting conservatism as exercising a degree of caution in the judgments and estimates in the case of uncertainty conditions, such that income and assets are not overstated, and expense and liabilities are not understated. Accounting conservatism practices are consistent with the traditional conservatism adage "anticipate no profits but anticipate all losses''. Kim and Kross (2005) and Bandyopadhyay *et al*. (2010) find that accounting conservatism has a significant positive relationship with the ability of current $EARN$ to predict the $FCFO$ in the US context. This thesis measures whether this remains the same in the MENA region firms where a reasonable level of accounting conservatism exists.

To sum up, this thesis sheds light on whether discretionary accruals, real activities manipulation, unintentional managerial errors, and accounting conservatism improve or deteriorate the predictive abilities of $EARN$, CFO and ACC with respect to the $FCFO$ in the MENA region firms. The next chapter presents the research methods used in this thesis to examine the research hypotheses.

Chapter 4

Research Methodology

4.1 Introduction

This chapter discusses the sample selection, data collection, variable measurements and research methodology used in this thesis to address its research questions. The research questions presented in this thesis are as follows: (i) what is the role of $EARN$, CFO and ACC along with their disaggregated components in predicting the one-year-ahead CFO for firms in the MENA region? (ii) Do intentional earnings management and unintentional managerial errors affect the ability of $EARN$ and its components in predicting the one-year-ahead CFO for firms in the MENA region? (iii) Does accounting conservatism affect the ability of $EARN$ and its components in predicting the one-year-ahead CFO for firms in the MENA region?

This chapter proceeds as follows: sections 4.2 and 4.3 discuss the data collection and sample selection used in this thesis, respectively. Section 4.4 describes the theoretical base of cash flow prediction tests as highlighted in Dechow *et al*. (1998) and Barth *et al*. (2001), along with providing a detailed overview of in-sample regression analysis and out-of-sample prediction tests as one of the most commonly used approaches in testing prediction models. Section 4.5 presents a description of earnings management and unintentional managerial errors, and explains the specifications of the models used to test their effect on the ability of $EARN$ and its components to predict the one-year-ahead CFO. Section 4.6 presents a description of conditional and unconditional accounting conservatism, and explains the specifications of the models used to test their effect on the ability of $EARN$ and its components to predict the one-year-ahead CFO. Finally, Section 4.7 concludes.

4.2 Data Collection

The variables of this thesis either dependent or independent are computed from the income statement, balance sheet, and statement of cash flows. Thus, this thesis uses secondary data for the firm-specific variables. The data for these variables are extracted from the financial database, the Refinitiv *Datastream*, for non-financial firms listed on the stock exchanges of the following MENA region countries: Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates.

According to the World Bank's official definition, the MENA region includes 21 countries, namely, Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, the United Arab Emirates and Yemen. Thus, some of the MENA region countries are excluded from the sample due to the following reasons. First, countries such as Algeria, Djibouti, Iraq, Lebanon, Libya, Palestine, Syria and Yemen do not have available data on *Datastream*. Second, these countries have relatively small stock exchanges with small number of listed firms. Fourth, Iran, Israel and Malta are excluded because they are non-Arab Middle Eastern countries, and this thesis focuses mainly on the Arab MENA region countries.

Overall, since the countries selected comprise the majority of listed firms in the MENA region by number and market capitalization as depicted in Figure 4.1. Figure 4.1 shows that these countries represent more than 65% of the firms and market capitalization of the

MENA region firms. Therefore, this thesis only examines the ten above mentioned countries as representative of the MENA region.

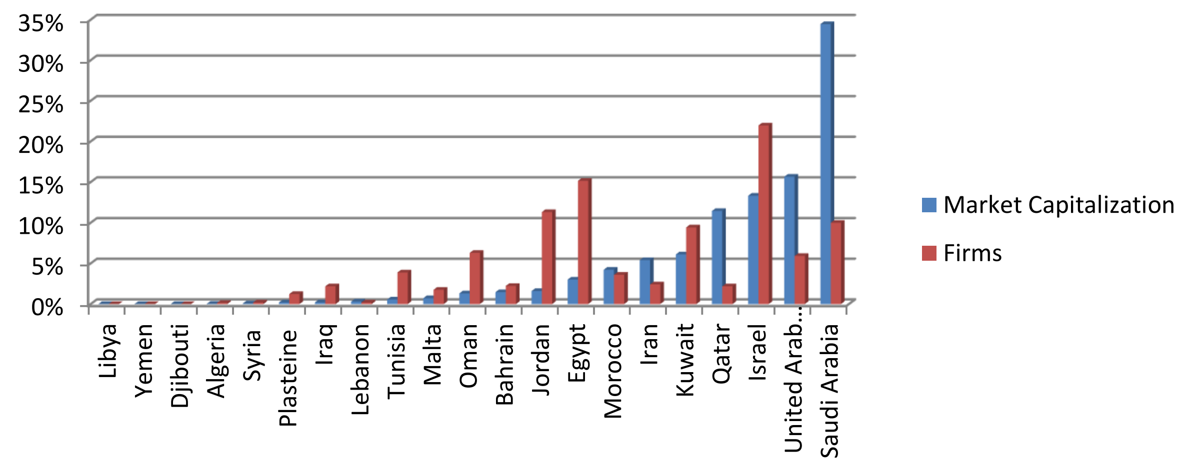

Figure 4.1: The Percentage of Listed Firms and the Total Market Capitalization of MENA region firms. **(Source: *OSIRIS*)**

4.3 Sample Selection

This thesis examines a total sample of 853 non-financial listed firms from the ten MENA region countries. The total number of sample firms for each country is as follows: Bahrain (20), Egypt (164), Jordan (149), Kuwait (127), Morocco (54), Oman (85), Qatar (25), Saudi Arabia (129), Tunisia (44), and the United Arab Emirates (56)[2]. The exclusion of financial institutions from the sample is common in the cash flow prediction literature (e.g., Barth *et al*., 2001; Al-Attar and Hussain, 2004; Orpurt and Zang, 2009; Ebaid, 2011). Financial institutions do not typically have data related to some ACC components that will be used in the prediction models, e.g., accounts receivable and inventory. (Kim and Kross, 2005; Ebaid, 2011). Table 4.1 presents the number of sample firms for each country after the exclusion of financial institutions and firms with inaccessible data.

[2] The excluded countries and the number of listed firms in these countries are as follows: Algeria (3 firms), Iran (51 firms), Iraq (46 firms), Lebanon (4 firms), Libya (no firms), Syria (4 firms), Palestine (26 firms), Yemen (no firms).

Table 4.1: Final Sample of Firms Across Countries (Source: *Datastream*)

Countries	Total Firms	Banks and Financial Institutions	Firms with Inaccessible Data*	Number of Sample Firms
Bahrain	50	25	5	20
Egypt	903	110	629	164
Jordan	283	83	51	149
Kuwait	226	72	27	127
Morocco	88	17	17	54
Oman	156	44	27	85
Qatar	49	18	6	25
Saudi Arabia	219	51	39	129
Tunisia	88	25	19	44
United Arab Emirates	132	58	18	56
Total	**2,194**	**503**	**838**	**853**

*The number of firms whose data are missing from *Datastream*, so they were excluded from the analysis. Thus, this introduces survivorship bias.

The time period of this thesis is from 2004 till 2018. The choice of this time period is due to the following reasons. First, this time period comprises a long period which allows for having large observations that can improve the data analysis process. Second, since most of the MENA region countries do not have sufficient data prior to 2004, the time period starts from 2004 to ensure having sufficient data for analysis. Although the time period of this thesis span the time period 2004-2018, the actual sample used in the analysis starts in 2005. This is mainly due to the fact that some variables in this thesis are calculated as the change across years. The 14 years' sample period used in this study covers a sufficient time span compared to the periods covered in the prior studies, such as Krishnan and Largay (2000), six years; Barth *et al*. (2001), 11 years; and Al-Attar and Hussain (2004), nine years.

The *Datastream* database provides a description of the industry and SIC codes for each firm. However, such SIC codes are not available for the MENA country firms and thus they could not be downloaded. Consequently, the Global Industry Classification Standard

(GICS) developed by Standard and Poor's is used to categorize the firms across ten sectors which are: Communication Services, Consumer Discretionary, Consumer Staples, Energy, Health Care, Industrials, Information Technology, Materials, Real Estate, and Utilities. Table 4.2 presents the sample distribution by industry classification and firm-year.

Table 4.2: Sample Distribution by Industry Sector and Year

Industry	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Communication Services	16	21	26	27	26	30	32	33	33	32	32	33	33	32	25
Consumer Discretionary	24	78	93	103	107	109	110	114	118	119	120	120	119	110	96
Consumer Staples	32	91	106	111	113	112	112	117	115	115	118	116	112	108	100
Energy	15	22	25	26	27	28	28	28	28	28	27	27	27	27	25
Health Care	8	30	32	34	35	34	36	37	38	39	40	40	40	38	35
Industrials	42	94	117	120	129	132	137	138	138	140	137	141	134	129	116
Information Technology	1	10	11	10	11	11	12	12	10	14	15	14	12	11	10
Materials	46	107	123	135	146	145	148	150	150	155	157	156	149	146	141
Real Estate	29	82	98	111	117	120	122	127	130	134	132	132	126	129	121
Utilities	6	10	11	12	12	12	14	15	18	19	18	18	18	18	18
Total	**219**	**545**	**642**	**689**	**723**	**733**	**751**	**771**	**778**	**795**	**796**	**797**	**770**	**748**	**687**

Given the missing data in the selected MENA region countries, running the analysis on each country individually may not be considered as the best approach to be followed in this thesis as the number of observations for each country would be small which may lead to small-sample bias. Furthermore, these small observations may also pose constraints on computing the dependent and independent variables in this thesis. To overcome this issue, the data for all ten countries are aggregated into a single dataset which comprises the MENA region.

Although the ten chosen MENA region countries share similar characteristics (they are Arab countries and they fall within the same geographical area), they differ in other perspectives such as the economic and political conditions and the accounting standards that they follow. To partially overcome this issue further analysis is conducted to differentiate between Gulf Cooperation Council (henceforth, GCC) and non-GCC country firms.

The MENA region countries are always categorized into these two distinct groups. The first group is the oil rich economies such as the GCC countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) whose economies are heavily dependent on producing and exporting oil. Although, these countries achieved relatively macroeconomic stability mainly because of the continuous increase in oil prices until 2014, the economic growth in these countries is not significant compared to the developed countries (Sourial, 2004; Naciri, 2008). The second group is the non-GCC countries such as Egypt, Jordan, Morocco and Tunisia. These countries relatively suffer from scarcity of resources (Naciri, 2008). However, they have undertaken several economic reform programs since mid-1980s opening up their economies to foreign investments, privatizing state-owned enterprises, reducing budget deficit and inflation and liberalized their trade (Sourial, 2004; Moumen, Othman and Hussainey, 2013), which enabled them to stabilize their economies and improve their economic conditions. Thus, the analysis of this thesis is conducted on the

MENA region as a whole and then further analysis is carried on the GCC and non-GCC country firms.

Further, it is necessary to identify and control the outliers because these cases are with extreme values that distort the statistics. Specifically, retaining the outliers may lead the multiple regression equations to reflect the unusual cases, rather than the usual ones. Thus, to account for the existence of outliers, previous research uses either the winsorizing approach, which replaces the upper and lower one percent of each empirical distribution with the respective values of the 2nd and 98th percentiles (e.g., Habib, 2010; Nam *et al*., 2012; Barth *et al*., 2016), or the trimming or truncation approach, which eliminates the upper and lower one percent altogether (e.g., Dechow *et al*., 1998; Barth *et al*., 2001; Orpurt and Zang, 2009; Lev *et al*., 2010; Bandyopadhyay *et al*., 2010). Although both approaches are often used to minimize the effect of outliers, Lien and Balakrishnan (2005) find that when applied to the independent variables; both approaches reduce the goodness of fit as well as the efficiencies of the estimates of slope. However, trimming does not affect the regression slopes and the mean square errors of the regression, thus, this thesis uses trimming as the main approach to reduce the effect of outliers. Specifically, observations that are in the top or bottom one percent of the distributions of all the variables used in this study are excluded.

Finally, Table 4.3 presents the total number of observations for each empirical model examined in this thesis after excluding outliers and missing data values necessary to compute the variables needed for estimating the research models. The three main empirical models examined in this thesis are: (i) the cash flow prediction models (Chapter 5); (ii) the models examining the effect of earnings management and unintentional managerial errors on the predictive ability of $EARN$ and its components (Chapter 6); and (iii) the models examining the effect of conditional and unconditional conservatism on the predictive ability of $EARN$ and its components (Chapter 7).

Table 4.3: Final Number of Firm-Year Observations for the Examined Models

The Models	Number of Firm-Year Observation
The cash flow prediction models	4,556
The models examining the effect of earnings management and unintentional managerial errors on the predictive ability of $EARN$ and its components	2,360
The models examining the effect of conditional and unconditional conservatism on the predictive ability of $EARN$ and its components	1,815

To ensure that the same number of observations is used in all models tested in each chapter, the firm-year observations in each chapter are unified for all models. The difference in the number of observations in each chapter is justified by the fact that the variables employed on each model (i.e., discretionary accruals model, real earnings management model, etc.) differ. Therefore, there might be some missing data values required in the computation of variables employed in one model which may not be required in another model. Furthermore, some values of a particular model may be outliers, and thus the number of observations of each model ultimately differs. However, the missing data values and trimmed data outliers lead to waste of information and possible reduction of the statistical power because both reduce the number of samples and thus the estimates might have larger standard errors (McKnight, McKnight, Sidani and Figueredo, 2007; Salgado, Azevedo, Proença and Vieira, 2016).

4.4 The Prediction of Future Cash Flows

Dechow *et al*. (1998) and Barth *et al*. (2001) are considered among the seminal papers that develop a theoretical framework which investigate the relationship between accounting data and the $FCFO$. The analysis of Dechow *et al*. (1998) begin by assuming that current $EARN$ can provide superior predictions of the $FCFO$ compared to current CFO. Dechow (1994) argue that cash flows suffer from timing and matching problems that cause them to be negatively serially correlated. For example, purchases tend to be paid before revenues are collected. Thus, any economic event starts by cash outflows in the current period and cash inflows in the next period, which gives an explanation for the negative serial correlation in the CFO changes (Dechow *et al*., 1998). Consequences of the error terms being serially correlated include inefficient estimation of the regression coefficients and this will, in turn, lead to invalid model significance (Fang and Koreisha, 2004). Thus, predictions generated from such models can be seriously misleading.

However, accruals are subject to revenue recognition and matching principles. By having such principles, accruals might give $EARN$ advantage over CFO in predicting the $FCFO$. If accruals are used to match cash receipts and payments related to the same economic event, thus, accruals can offset extreme negative and positive cash flow realizations associated with mismatched cash receipts and payments over short-time intervals (Dechow, 1994). Therefore, the negative serial correlation in cash flow changes through time can be smoothed out by accruals to generate earnings changes that are much less negatively serially correlated (Dechow *et al*., 1998). Based on the previous argument, depending on CFO alone to predict the $FCFO$ may result in inefficient prediction models because of its negative serial correlation, while this can be enhanced through adding accruals to the prediction models.

Therefore, Dechow *et al*. (1998) develop a theoretical model to explain the role of $EARN$, which includes CFO and working capital accruals (specifically, the change in accounts receivable, the change in inventory and the change in accounts payable), as a predictor of the $FCFO$. However, Dechow *et al.* do not examine the predictive ability of the ACC components separately which is subsequently examined by Barth *et al.* (2001) by disaggregating $EARN$ into CFO and six major ACC components (the change in accounts receivable, the change in inventory, the change in accounts payable, depreciation, amortization, and other accruals).

4.4.1 Dechow *et al*. and Barth *et al.* Theoretical Framework

Dechow *et al*. (1998) develop a theoretical framework to analyse the role of $EARN$, CFO and ACC as predictors of the $FCFO$. In their theoretical framework, it is shown that $EARN$ is equal to CFO plus working capital accruals. Their model considers three working capital accruals which cause a difference between $EARN$ and CFO: accounts receivable (A/R), accounts payable (A/P) and inventory (INV). They argue that the predictability of the $FCFO$ is observable in working capital (short-term) accruals rather than in long-term accruals. They argue that working capital accruals are transformed to CFO in a short period so that their effects are observable in one-year-ahead forecasts, while long-term accruals are associated with cash flows over much longer time periods.

Further, Dechow *et al*. argue that the change in A/R depends on sales, while the change in A/P depends on the change in purchases, which depends on the relevant period's inventory. Finally, the change in INV depends on following period expected sales and any deviation of the target inventory from the actual inventory. Therefore, they assume that sales generate the accounting cycle of the three working capital accruals. They base their model on an assumption about sales generating process rather than cash flow generating process because sales contract specifies both the amount and timing of the cash inflows and outflows, and also the recognition of earnings. The sales contract determines when and under what conditions the customer has to pay. Thus, those conditions determine when future cash inflows and its related cash outflows are valid and then have to be included in earnings. In defining earnings and then the three working capital accruals, Dechow *et al*. assume that current $EARN$ is a constant proportion of current sales ($SALES$) and that sales follow a random walk as follows:

$$EARN_t = \pi SALES_t \text{ and } SALES_t = SALES_{t-1} + \varepsilon_t \tag{4.1}$$

where, $0 < \pi < 1$ represents the profit margin, t denotes time period, and ε is a random shock (change in sales) with a mean of zero, where $\Delta SALES_t = SALES_t - SALES_{t-1} = \varepsilon_t$. Thus, Dechow *et al*. model sales as a random walk which in turn affects the three working capital accruals (A/R, A/P and INV). The first working capital accruals in Dechow *et al*.'s model is the A/R in which it is modelled as a constant proportion, α, of sales. They state that sales and cash flow from sales are not considered as a one-to-one relationship because some sales are made on credit. Thus, they assume that proportion, α, of the firm's sales remains uncollected at the end of the period so that A/R_t and one-period change in A/R_t are as follows:

$$A/R_t = \alpha\, SALES_t \quad \text{and} \quad \Delta\, A/R_t = \alpha \varepsilon_t \tag{4.2}$$

Assuming $0 < \alpha < 1$ allows a part of sales to be received in cash in the following period. Thus, A/R incorporates expected future cash flows (collection of A/R) into $EARN$.

The second working capital accruals in Dechow *et al*.'s model is INV which consists of a target level and a deviation from that target. γ_1 and γ_2 are the two model parameters which reflect the inventory policy, where $0 < \gamma_1, \gamma_2 < 1$. $\gamma_1$is a constant fraction of following period's forecasted cost of sales. Dechow *et al*. assume all expenses vary with sales, so cost of sales for period t is $(1-\pi)SALES_t$. Since they assume sales follow a random walk, in which the best forecast of $SALES_{t+1}$ is $SALES_t$, thus, target inventory is $\gamma_1(1-\pi)SALES_t$. Actual inventory deviates from the target level because actual and forecasted sales are different, thus there is an inventory build-up or liquidation. The deviation is given by $\gamma_2\gamma_1(1-\pi)\varepsilon_t$, where $\gamma_2$is constant fraction of the current sales shock, ε_t. If γ_2 is equal to 0, this means that the firm does not deviate from the target, while if γ_2 is equal to 1, this means that the firm makes no inventory adjustment. Inventory for period t, INV_t and $\Delta\, INV_t$, are then:

$$INV_t = \gamma_1(1-\pi)SALES_t - \gamma_1\gamma_2(1-\pi)\varepsilon_t \tag{4.3}$$

$$\Delta INV_t = \gamma_1(1-\pi)\varepsilon_t - \gamma_1\gamma_2(1-\pi)\Delta\varepsilon_t \tag{4.4}$$

The third working capital accruals in Dechow *et al*.'s model which causes a difference between $EARN$ and CFO is A/P. A/P is considered as a proportion of the firm's purchases which remains unpaid at the end of the period. Thus, A/P is a prediction of future cash outflows. Purchases are defined as the sum of cost of sales and change in inventory during the period. Therefore, if a firm purchases all its inputs just in time, so inventory is zero $(\gamma_1 = 0)$, then purchases are only equal to cost of sales for the period $(1-\pi)SALES_t$. Since purchases are on credit, like sales, then A/P is considered as a proportion of purchases. β represents the proportion of the firm's purchases which remains unpaid at the end of the period, A/P_t and $\Delta A/P_t$ are as follows:

$$A/P_t = \beta P_t = \beta[(1-\pi)SALES_t + \gamma_1(1-\pi)\varepsilon_t - \gamma_1\gamma_2(1-\pi)\Delta\varepsilon_t] \tag{4.5}$$

$$\Delta A/P_t = \beta[(1-\pi)\varepsilon_t + \gamma_1(1-\pi)\Delta\varepsilon_t - \gamma_1\gamma_2(1-\pi)\Delta\varepsilon_{t-1}] \quad (4.6)$$

According to Dechow *et al*.'s model, $EARN$ is equal to CFO and the change of the three working capital accruals: $EARN_t = CFO_t + \Delta A/R_t + \Delta INV_t - \Delta A/P_t$. Thus, CFO is the difference between $EARN$ and change of these three working capital accruals. This difference represents cash inflows from sales and outflows for purchases. Thus, Dechow *et al.* express the CFO as shown in the following equation:

$$CFO_t = \pi SALES_t - [\alpha + (1-\pi)\gamma_1 - \beta(1-\pi)]\varepsilon_t + \gamma_1(1-\pi)[\beta + \gamma_2(1-\beta)]\Delta\varepsilon_t + \beta\gamma_1\gamma_2(1-\pi)\Delta\varepsilon_{t-1} \quad (4.7)$$

The first term in Equation 4.7, $\pi SALES_t$, is the firm's $EARN$ for the period and so the remaining terms are working capital accruals. If there are no working capital accruals (sales and purchases are cash so $\alpha = \beta = 0$, and no inventory so $\gamma_1 = 0$), $EARN$ and CFO for the period are equal. In their conclusion, Dechow *et al*. ignore the effect of changes in working capital accruals resulting from the current sales shock (second term in Equation 4.7), and changes in shocks from prior periods (the third and the fourth terms in Equation 4.7) because they empirically suggest that the second, third and fourth terms are close to zero. Consequently, if they assume that the shock term ε_t of the previous period has expected value of zero and is uncorrelated with future shocks, then the best predictor of CFO_{t+1} is $\pi SALES_t = EARN_t$. Thus, they suggest that a current $EARN$ is the best predictor of the $FCFO$.

Barth *et al*. (2001) build on the model developed by Dechow *et al*. (1998) to describe that current change in working capital accruals has an effect in predicting the one-year-ahead CFO. Barth *et al*. argue that Equation 4.7 should be expressed in terms of $SALES_{t+1}$, and sales shocks ε_{t+1}, ε_t and ε_{t-1} to predict the one-year-ahead CFO. Thus, they rewrite Equation 4.7 as follows:

$$CFO_{t+1} = \pi SALES_{t+1} - [\alpha + (1-\pi)\gamma_1 - \beta(1-\pi)]\varepsilon_{t+1} + \gamma_1(1-\pi)[\beta + \gamma_2(1-\beta)]\Delta\varepsilon_{t+1} + \beta\gamma_1\gamma_2(1-\pi)\Delta\varepsilon_t \quad (4.8)$$

Barth *et al*. argue that Dechow *et al*.'s conclusion is based on assumptions with severe limitations. Dechow *et al*. ignore the working capital accruals in Equation 4.7 to obtain current $EARN$ as best predictor of the one-year-ahead CFO. As they assume that the coefficients of the working capital accruals, second, third and fourth terms in Equation 4.7, are close to zero. However, according to Barth *et al*., these terms are not equal to zero in expectation at time t. They point out that the expected change in the sales shock ($\Delta\varepsilon_{t+1}$) equals the negative value of the current sales shock ($-\varepsilon_t$), and the current change in the sales shock equals the difference between current and past sales shocks($\Delta\varepsilon_t = \varepsilon_t - \varepsilon_{t-1}$), where ε_t and $\varepsilon_{t-1}$are realizations of the random variable ε at time t and $t-1$ which only equal to zero by chance.

Therefore, Barth *et al*. rework the model to account for their criticisms of the Dechow *et al*.'s model. Barth *et al*. derive a term for the expected value of the one-year-ahead CFO, which includes the current CFO and change values of the three working capital accruals A/R, A/P, and INV along with depreciation, amortization and other accruals. They argue that a model that aims to predict the $FCFO$ should disaggregate $EARN$ into CFO and ACC components as each component has different information about the $FCFO$, and consequently each contributes to the prediction of the $FCFO$ in a different way. In contrast, aggregate $EARN$ masks the information of each individual ACC component in predicting the $FCFO$.

Therefore, two major conclusions are drawn from Barth *et al*. model as an extension to the conclusion of Dechow *et al*.'s model: (i) Disaggregating $EARN$ into its components (CFO and ACC components) can provide incremental information to the prediction of the $FCFO$ over aggregate $EARN$; and (ii) long-term ACC (depreciation and amortization) have a considerable role in predicting the $FCFO$. Further, they suggest that it is possible that disaggregating the components of CFO could enhance its ability in predicting the $FCFO$, just as disaggregating the components of $EARN$ enhance its predictive ability. However, they argue that such components are available only for relatively small number of firms that use the DM in preparing the cash flow statement. Thus, they argue that this approach may not be viable for empirical testing.

In contrast, Krishnan and Largay (2000) argue that the data availability obstacle can be overcome by estimating the DM components even for firms that use the IM for preparing the cash flow statement. They argue that using the DM components either actual or estimated is superior compared to the aggregate CFO in predicting the one-year-ahead CFO.

In conclusion, given the variety of prediction models available and their theoretical arguments as proposed by Dechow *et al*. (1998) and modified by Barth *et al*. (2001) and Krishnan and Largay (2000), this thesis aims to test six cash flow prediction models. Specifically, the one-year-ahead CFO in this thesis is predicted on the basis of a model hierarchy that initially incorporates aggregate predictors ($EARN$, CFO and ACC) and then their disaggregated components as suggested by Krishnan and Largay (2000) and Barth *et al*. (2001). Consequently, this thesis provides a comprehensive analysis of different cash flow prediction models by testing whether disaggregating $EARN$ into CFO and five ACC components as suggested by Barth *et al*. enhances its ability to predict the one-year-ahead CFO. Furthermore, this thesis follows Krishnan and Largay (2000) in disaggregating CFO into the DM components to examine also whether disaggregating CFO enhances its ability to predict the one-year-ahead CFO. Thus, potential information content of $EARN$ and its components with regard to the one-year-ahead CFO is a major theme of this thesis.

4.4.2 Prediction Models

The first major issue in this thesis is to empirically examine the relative abilities of $EARN$ and CFO in predicting the one-year-ahead CFO, and whether there are significant gains of the disaggregation of $EARN$, CFO and ACC in the prediction process. Further, this thesis investigates which prediction model has a superior ability to predict the one-year ahead CFO from the six regression models shown below. This is done through the regression-based analytical framework and out-of-sample prediction tests. These models are similar to those of Dechow *et al*. (1998), Krishman and Largay (2000), Barth *et al*. (2001), Al-Attar and Hussain (2004), Kim and Kross (2005), Cheng and Hollie (2008), Orpurt and Zang (2009) and Nam *et al*. (2012). The subscripts t and i denote year and firm, respectively.

Model 1: $CFO_{it+1} = \beta_0 + \beta_1 EARN_{it} + \varepsilon_{it+1}$ (4.9)

Model 2: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it+1}$ (4.10)

Model 3: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 ACC_{it} + \varepsilon_{it+1}$ (4.11)

Model 4: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 \Delta A/R_{it} + \beta_3 \Delta INV_{it} + \beta_4 \Delta A/P_{it} + \beta_5 DEP_{it} + \beta_6 ACCOTHERS_{it} + \varepsilon_{it+1}$ (4.12)

Model 5: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4 CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \varepsilon_{it+1}$ (4.13)

Model 6: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4 CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \beta_7 \Delta A/R_{it} + \beta_8 \Delta INV_{it} + \beta_9 \Delta A/P_{it} + \beta_{10} DEP_{it} + \beta_{11} ACCOTHERS_{it} + \varepsilon_{it+1}$ (4.14)

Equations 4.9 and 4.10 examine the ability of aggregate $EARN$ and the aggregate CFO to predict the one-year-ahead CFO independently to be able to compare between the predictive ability of each model to examine Hypothesis 3. Equations 4.11 to 4.14 examine whether disaggregating $EARN$, CFO and ACC into their major components could enhance their ability to predict the one-year-ahead CFO. Equation 4.11 disaggregates $EARN$ into the CFO and total ACC, whereas in Equation 4.12, total ACC is further disaggregated into its major components since each major ACC reflects different information about the $FCFO$, resulting in different weight in prediction (Barth *et al.*, 2001). Thus, the aim of Equations 4.11 and 4.12 are to examine Hypotheses 2.1 and 2.2, respectively. Then, CFO is also disaggregated into the DM components in Equation 4.13 to examine Hypothesis 1. Finally, Equation 4.14 is a full disaggregation model which disaggregates both CFO and ACC into their components to test Hypothesis 4.

The variable definitions and measurements used in the one-year-ahead CFO prediction models are consistent with the definitions used by Krishman and Largay (2000), Barth *et* *al*. (2001), Al-Attar and Hussain (2004), Cheng and Hollie (2008), Orpurt and Zang (2009), Lorek and Willinger (2009) and Nam *et al.* (2012), and they are as follows: $EARN$ is defined as net (after tax) earnings before extraordinary items and discontinued operations during the period. CFO is net cash flows from operating activities as reported in the statement of cash flows. ACC is the difference between $EARN$ and CFO.

The ACC components are: (i) the change in accounts receivable for firm i during year t ($\Delta A/R_{it}$); (ii) the change in inventory for firm i during year t (ΔINV_{it}); (iii) the change in accounts payable for firm i during year t ($\Delta A/P_{it}$); (iv) depreciation, and amortization for firm i in year t (DEP_{it}); and (v) other ACC for firm i during year t ($ACCOTHERS_{it}$). $ACCOTHERS$ is a plug figure, where $ACCOTHERS_{it} = EARN_{it} - (CFO_{it} + \Delta A/R_{it} + \Delta INV_{it} - \Delta A/P_{it} - DEP_{it})$.

The DM components are unavailable in the MENA region companies because they follow the IM, thus DM components are estimated from other financial statements, except for cash flows related to taxes and interests which are required disclosures regardless of whether the IM or the DM is employed. Consequently, the DM components are: (i) estimated cash received from customers ($CSHRD$); (ii) estimated cash paid to suppliers and employees ($CSHPD$); (iii) disclosed cash related to tax payments ($CSHTAX$); (iv) disclosed cash related to interest income ($CSHINTIN$); (v) disclosed cash related to interest payments ($CSHINTPD$) and (vi) other CFO ($CSHOTHERS$). The DM components are calculated as follows:

$$CSHRD_{it} = SALES_{it} - \Delta A/R_{it} \tag{4.15}$$

$$CSHPD_{it} = COGS_{it} - DEP_{it} + Selling\ and\ Admin\ Expenses_{it} + \Delta INV_{it} - \Delta A/P_{it} + \Delta other\ CA_{it} - \Delta other\ CL_{it} \quad (4.16)$$

$$CSHOTHERS_{it} = CFO_{it} - (CSHRD_{it} - CSHPD_{it} - CSHTAX_{it} + CSHINTIN_{it} - CSHINTPD_{it}) \quad (4.17)$$

where, $COGS_{it}$ is cost of goods sold for firm i and year t, $Selling\ and\ Admin\ Expenses_t$ is selling and administrative expense for firm i and year t, $\Delta\ other\ CA_{it}$ is one-year change in other current assets for firm i during year t, where $\Delta other\ CA_{it} = \Delta CA_{it} - (\Delta INV_{it} + \Delta A/R_{it})$ and $\Delta other\ Cl_t$ is one-year change in other current liabilities for firm i during year t, where $\Delta other\ CL_{it} = \Delta CL_{it} - \Delta A/P_{it}$. All of the variables are scaled by average total assets between the beginning and the end of the year, consistent with Barth *et al*. (2001) and Lev *et al*. (2010). After defining the six prediction models and the measurements of the variables used in them, these models are examined through (i) in-sample regression analysis and; (ii) out-of-sample prediction test.

4.4.2.1 In-Sample Prediction Tests

Firstly, the six prediction models will be examined using regression-based analytical framework. The data of this thesis is a panel data which is a combination of time series and cross-sectional data. One of the simplest, and possibly naive, approaches to deal with the panel data is to ignore the cross sectional and time dimensions of such data and just estimates a pooled regression, which would involve estimating a single equation on all the data together. Then this equation would be estimated in the usual fashion using the ordinary least squares which has some severe limitations (Brooks, 2014).

The pooled regression models (henceforth, PRM) assume that model parameters remain constant over time and across all of the cross-sectional units in the sample. However, there might be systematic differences between firms due to firm specific accounting choices and industry factors that result in notable variations in cash flow levels across firms (Al-Attar and Hussain, 2004). In this case, the disturbance terms across the whole data set are not consistent with the assumptions underlying the PRM and thus may lead to biased estimates. However, the PRM is the method employed in almost all the previous studies in the field of cash flow prediction (e.g., Barth *et al*., 2001; Cheng and Hollie, 2008; Ebaid, 2011; Farshadfar and Monem, 2013b). Thus, despite the limitations of the PRM, this thesis reports the results of the in-sample regression analysis using the PRM so that they can be compared to the results reported by the prior studies.

Further, to mitigate the severe limitations of the PRM, this thesis employs the two most commonly used panel data regression models which are the fixed effect model (henceforth, FEM) and the random effect model (henceforth, REM) consistent with Al-Attar and Hussain (2004) and Farshadfar *et al*. (2008). The firm-specific variations can be controlled using the FEM or the REM. The FEM allows the intercept term in the regression model to vary across each individual firms, whilst the slope coefficients remain constant across all the firms. In the FEM, the intercept in the regression model is allowed to differ among each individual firm in recognition of the fact that each cross-sectional unit may have some special characteristics of its own. Therefore, the FEM is suitable in cases where individual specific intercept is correlated with one or more of the independent variables (Gujarati, 2004; Brooks, 2014).

The REM is another econometric method for panel data. In the REM, it is assumed that there is a single common intercept term, but that the intercepts for individual firms vary from this common intercept in a random manner. Thus, this method is appropriate in situations where random intercept of each cross-sectional unit is uncorrelated with the independent variables. When the REM is satisfied, then it is more efficient than the FEM and should be used, and vice versa (Gujarati, 2004; Brooks, 2014).

Hausman's (1978) specification test is used to evaluate whether the FEM or the REM is appropriate by testing for the null hypothesis of no correlation between the unique errors and the regressors. If the Hausman test rejects the null hypothesis, then the REM is biased and not appropriate and the FEM should be used (Brooks, 2014). To sum up, the in-sample regression results of this thesis are derived from appropriate multivariate models estimated using the PRM, and later the FEM or the REM based on the results of Hausman test.

There are several criteria that have been used to compare between regression models for prediction purposes: (i) adjusted R-squared statistics; (ii) Akaike information criterion (henceforth, AIC); (iii) Bayesian information criterion (henceforth, BIC); (iv) Mallow's C_p criterion; and (v) forecast χ^2 (chi-square). All these criteria aim at minimizing the residual sum of squares (RRS). All these criteria sufficiently penalise the addition of increasingly large number of independent variables in contrast to the R-squared statistic (Gujarati, 2004). Although most of these methods are criticized of being too descriptive and that they lack theoretical properties, they are still widely used by practitioners. Gujarati (2004) and Brooks (2014) argue that none of these criteria is preferred over the other. Therefore, three of the most widely measures are utilized to deal with the problems associated with the traditional R-squared statistics which are the adjusted R-squared statistics, AIC and BIC metrics, consistent with Al-Attar and Hussain (2004). The model with the lowest values of AIC and BIC is preferred. Further, to provide more rigorous test of the models, bootstrapping is used to compare between the performances of the different models.

Bootstrapping is a type of statistical resampling that can be used to identify the sampling distribution of any summary statistics or a relationship when this sampling distribution is hard to obtain analytically. MacKinnon (2002) argues that the test of significance using bootstrapping provides more accurate inferences compared to traditional approaches as it doesn't impose strong distributional assumptions. Despite the fact that bootstrapping is now widely used, most cash flow prediction studies use Vuong (1989) z-statistic to compare between these models. Thus, this thesis attempts to provide more accurate tests of the cash flow prediction models by using bootstrapping technique to identify whether there are significant differences between the adjusted R-squared statistics of different prediction models. To achieve this aim, 1000 bootstrap replications are generated and the difference between the adjusted R-squared statistics between any two models is calculated and the p-value is estimated from the empirical distribution of the bootstrapped difference between the adjusted R-squared statistics.

4.4.2.2 Out-of-Sample Prediction Tests

Most of the cash flow prediction studies use in-sample regression analysis which relies on the statistical correlation between the predictors and the $FCFO$ to assess the predictive ability of each model. The in-sample regression analysis mainly measures how well current $EARN$, CFO, ACC and their disaggregated components can explain variation in the one-year-ahead CFO. However, Watts and Leftwich (1977) provide empirical evidence for the inconsistency between goodness-of-fit statistics, such as the adjusted R-squared statistics, and the predictive ability. Further, Kim and Kross (2005) and Lorek and Willinger (2009) state that good descriptive fit may not imply good predictive performance due to over-fitting the data. To address this problem, the thesis provides further analysis to evaluate which of the six models in Equations 4.9 to 4.14 provides the best predictive ability for the one-year-ahead CFO.

In the out-of-sample prediction tests, all the prediction models are estimated cross-sectionally for all firms within a given industry every year, with at least eight observations, because the relative importance of $EARN$, CFO and ACC in predicting the one-year-ahead CFO probably differs across industries due to the different accounting policy choices in each industry. Using eight observations ensures that there is enough data to estimate the parameters of the model (Doukakis, 2014). For example, CFO_{2004} is regressed on $EARN_{2003}$ and CFO_{2003}, then the coefficients will be taken from that model and applied to the independent variables in year 2004 to generate a one-year-ahead prediction for CFO_{2005}, consistent with Kim and Kross (2005) and Lev *et al*. (2010). This means that for each year t and firm i, each independent variable in Equations 4.9 to 4.14 has been adjusted by the coefficients estimated for each year and industry. Finally, an error metric is computed to assess the predictive ability of each model which is the absolute prediction error (henceforth, $ABSE$), similar to Lev *et al*. (2010) and Nam *et al*. (2012). $ABSE$ is calculated as follows:

$$ABSE_{i,t,m} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1,m}\right)\right| \qquad (4.18)$$

The subscript m indicates which model is used to calculate the $ABSE$ (1,2,3,4,5 or 6). $ABSE$ is the absolute difference between the actual one-year-ahead CFO as reported in the firm's statement of cash flows and the predicted one-year-ahead CFO from each model. If the value of pooled $ABSE$ is low, then this indicates that the model has high predictive ability. Then, the mean and median of the prediction error are computed in the out-of-sample period to compare the predictive ability in pairs. To identify whether the means of the prediction errors significantly differ from each other, t-statistic and bootstrapping techniques are used where 1000 bootstrap replications are generated and the difference between the $ABSE$ is identified between any two models and the p-value is estimated from the empirical distribution of the bootstrapped difference between the $ABSE$, whereas the Wilcoxon signed rank test is used to compare between the medians of the models.

Since the out-of-sample prediction test is more accurate than the in-sample regression analysis (Watts and Leftwich, 1977; Lev *et al.*, 2010), therefore, the prediction errors from the out-of-sample tests are used as dependent variable to measure the effect of earnings management and unintentional managerial errors, and accounting conservatism on the predictive abilities of $EARN$, CFO and ACC.

4.5 Earnings Management and Unintentional Managerial Errors

This thesis measures how earnings management and unintentional managerial errors can affect the predictive ability of $EARN$ and its components. Earnings can be of poor quality for two main reasons. The first reason is earnings management that intentionally biases earnings and consequently affects cash flows and accruals. The second reason is the unintentional managerial errors in estimating accruals that may occur due to the difficulties that managers may face in predicting an uncertain future. Concerning earnings management, there is extensive literature that shows that managers use discretionary accruals and real activities manipulation to manage earnings upwards or downwards. As for unintentional errors, Dechow and Dichev (2002) state that the quality of earnings is not limited to managerial opportunism, but is also related to the inherent difficulty in estimating earnings. Whether reported earnings is intentionally manipulated or unintentionally mistakenly estimated, in both cases, these errors might affect the ability of $EARN$ and its components to predict the one-year-ahead CFO. By studying the effect of both types of managerial errors, this thesis provides a contribution to the existing literature.

The dependent variables here are the $ABSE$ of $EARN$ and CFO prediction models, similar to Bandyopadhyay *et al*. (2010) and Nam *et al*. (2012). In addition, the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT,), is another dependent variable measuring the predictive ability of ACC, consistent with Nam *et al*. (2012). Since, ACC cannot be used as a sole predictor of the $FCFO$, the contribution that ACC adds to the prediction of the one-year-ahead CFO over the predictive ability of current CFO alone is used to investigate its predictive ability. ACC_CONT is the difference between the absolute error in predicting one-year-ahead CFO using current CFO as the only predictor (Model 2) and the absolute prediction error using CFO and total ACC together as predictors (Model 3). The difference between the absolute prediction errors of these two models measure the extent to which total ACC contribute to more accurate predictions of the one-year-ahead CFO. The higher this measure, the more ACC improve upon current CFO in predicting one-year-ahead CFO.

The independent variables are earnings management techniques and unintentional managerial errors. Discretionary accruals and real activities manipulation are proxy for earnings management. Discretionary accruals and unintentional managerial errors are measured through the accruals quality measure developed by Dechow and Dichev (2002) and modified by Francis *et al*. (2005), while real earnings management is measured through the measure developed by Roychowdhury (2006) as explained in the following sub-sections.

4.5.1 Discretionary Accruals and Unintentional Managerial Errors Measures

Discretionary accruals are used to measure accrual-based earnings management. The models of accrual-based earnings management range from simple models, in which total accruals are utilized as a measure of discretionary accruals, to more sophisticated models that use regression analysis to differentiate between discretionary accruals and nondiscretionary accruals (Bartov *et al.,* 2000). In the literature, various models are developed to measure discretionary accruals, for example, Jones (1991) model, Kasznik (1999) model, Dechow and Dichev (2002) model, Dechow *et al.* (2003) model and the modified Jones model (Dechow *et al*., 1995).

Although the modified Jones model (Dechow *et al*., 1995) is the most widely used model in the earnings management literature, this thesis employs the model developed by Dechow and Dichev (2002) and modified by Francis *et al*. (2005) to capture the discretionary accruals. The modified Jones model has been subject to many criticisms. First, the modified Jones model considers accruals as abnormal accruals if they are not explained by the limited set of fundamentals (PPE and change in revenues) (Dechow *et al*., 2003; Francis *et al*., 2005; Dechow *et al*., 2010). Thus, the ability of the modified Jones model to accurately decompose accruals into discretionary and non-discretionary components is still doubtful (McNichols, 2000; Siregar and Utama, 2008). Guay, Kothari and Watts (1996) provide evidence that the modified Jones model is estimating discretionary accruals with considerable imprecision. Accordingly, there is a possibility of misclassification of non-discretionary and discretionary accruals. Thus, if some components of non-discretionary accruals are mistakenly classified as discretionary accruals, thus, these models may falsely indicate that discretionary accruals are value relevant, especially when predicting the $FCFO$.

Second, the modified Jones model fail to differentiate between poor accruals quality that is driven from innate characteristics of a firm's business model (e.g., changing receivables turnover) and changing the operating environment (e.g., exiting a line of business or geographic region), and poor accruals quality due to managers' judgment and discretion (McNichols, 2002; Francis *et al*., 2005).

Given the above criticisms facing the modified Jones model, although all models of discretionary accruals suffer from misclassification problem, the Dechow and Dichev (2002) model modified by Francis *et al*. (2005) attempt to deal with this problem by including more variables compared to the modified Jones model. Furthermore, to account for the failure of the modified Jones model to differentiate between the intentional and unintentional errors, the modified Dechow and Dichev model (Francis *et al*., 2005) emerged to overcome these limitations and differentiate between the intentional managerial errors (discretionary accruals) and unintentional managerial errors. Therefore, this thesis employs the modified Dechow and Dichev model (Francis *et al*., 2005) to capture discretionary accruals and unintentional managerial errors at the cross-section, based on the industry classification of the individual firms for at least eight observations. Although, this measure has been used by many studies (e.g., Doyle, Ge and McVay, 2007; Gray, Koh, Tong, 2009; Kent, Routledge and Stewart, 2010), it is not used in the cash flow prediction research. Therefore, using this model adds a new contribution to the literature.

4.5.1.1 Dechow and Dichev Model

Dechow and Dichev (2002) build their accruals quality measure on assuming that there is a relationship between current working capital accruals and CFO in the past, current and future periods. In their model, accruals quality is measured by the extent to which working capital accruals map into the CFO realizations. They derive an empirical measure of accruals quality as the residuals from firm-specific regressions of changes in working capital accruals on past, current, and future CFO.

Dechow and Dichev argue that the accruals accounting system allows temporary adjustments that shift cash flow recognition over time. When cash flow recognition is shifted, two accrual entries are recorded (opening and closing accrual entries). The opening accrual entry appears (i) when a revenue or an expense realized before cash is received or paid (e.g. accounts receivable and accrued liabilities); or (ii) when cash is received or paid before it is recognized in earnings (e.g. deferred revenue and prepaid expense). The closing accrual entry is recorded (i) when cash is received or paid; or (ii) when a revenue or expense is recognized. Then, the accrual portion of the original entry is reversed in the closing accrual entry.

In the first case when cash receipts and payments follow revenues and expense recognition, managers have to estimate the amount of cash to be received or paid in the future. The estimated amount of accrual might differ from the cash flow realizations. Therefore, the opening accrual includes an estimation error that is corrected by a closing accrual. The opening and closing of ACC and their relationship with the cash flows (CF) are as follows:

Name	Opening or Closing ACC	Amount of Cash Flows
Accrual for future cash receipts and disbursements - Opening.	ACC^O	$= CF_{t+1}^{t} + \varepsilon_{t+1}^{t}$
Same sign as related cash flow		
Accrual for future cash receipts and disbursements - Closing.	ACC^C	$= -CF_{t}^{t-1} - \varepsilon_{t}^{t-1}$
Opposite sign to related cash flow		

For ACC, the superscript indicates whether it is opening or closing ACC. For cash flows, superscript denotes the period when the cash flows is recognized in earnings, while the subscript denotes the period when a cash flow is received or paid. The opening ACC at time t is equal to the actual cash flow at $t+1$ plus an estimation error term (the difference between the expected and actual cash flows). Dechow and Dichev assume that all ACC disappear in one period, so a closing ACC for cash receipts and disbursements at time t cancels the opening ACC from $t-1$. The closing ACC is equal to the actual amount of cash flow received or paid in t plus a realized error term.

In the second case when cash receipts and payments precede revenue and expense recognition, the accounting system records the amount of cash flows either as cash inflows for deferred revenue or cash outflows for deferred expense. Since the cash flows is collected or paid before recognition, these ACC do not contain estimation errors. The opening and closing ACC and their relationship with the cash flows is as follows:

Name	Opening or Closing **ACC**	Amount of Cash Flows
Accrual that defers the recognition of cash flows- Opening. Opposite sign to related cash flows	ACC^{O}	$= -CF_t^{t+1}$
Accrual that defers the recognition of cash flows- Closing. Same sign as related cash flows.	ACC^{C}	$= CF_{t-1}^{t}$

Therefore, they define the total accruals in period t as follows:

$$ACC_t = CF_{t-1}^{t} - (CF_t^{t-1} + CF_t^{t+1}) + CF_{t+1}^{t} + \varepsilon_{t+1}^{t} - \varepsilon_t^{t-1} \tag{4.19}$$

Equation 4.19 reports that (i) ACC are equal to last year, current and one-year-ahead cash flows plus an estimation error term; (ii) ACC are negatively related to current cash flows and positively related to past and future cash flows; and (iii) the error term represents the extent to which ACC map onto the cash flow realization. Based on Equation 4.19, they define the determinants of the working capital accruals as follows:

$$\Delta WC\_ACC_{it} = \beta_0 + \beta_1 CFO_{it-1} + \beta_2 CFO_{it} + \beta_3 CFO_{it+1} + \varepsilon_{it} \tag{4.20}$$

Where:

$$\Delta WC\_ACC_{it} = \Delta A/R_{it} + \Delta INV_{it} - \Delta A/P_{it} - \Delta Taxes\ Payable_{it} + \Delta other\ assets(net)_{it}.$$

Dechow and Dichev use the above firm-specific regressions to derive a practical measure of working capital accruals quality. Thus, they focus on the ability of this model to detect estimation errors in working capital accruals. Further, they argue that if there are no estimation errors and no measurement errors, then the estimated coefficients of Equation 4.20 should be $\beta_1 = \beta_3 = 1$ and $\beta_2 = -1$. In this case, the adjusted R-squared statistics should be one and residual variance should be zero. Thus, the residuals results of the regression represent the working capital accruals that are unrelated to the CFO realizations. The standard deviation of these residuals is a firm-level measure of accruals quality, in which a higher standard deviation means lower accruals quality. Further, Francis *et al*. (2005) modify the Dechow and Dichev (2002) model based on the model proposed by McNichols (2002).

4.5.1.2 Francis *et al*. Model

McNichols (2002) argues that the variables suggested by the Jones (1991) model, change in sales revenue and PPE, are important in forming expectations about current accruals, over and above the effects of CFO. Jones (1991) argues that revenues are added to control for a firm's economic environment because they are an objective measure for the firm's operating activities before a manager's manipulations. He also adds PPE to control the portion of total accruals that are related to nondiscretionary (normal) depreciation expense.

McNichols (2002) shows that adding these variables to the regression-based model of the Dechow and Dichev (2002) significantly increase the adjusted R-squared statistics and thus reduces measurement error. Therefore, Francis *et al*. (2005) modify and extend the Dechow and Dichev (2002) model as suggested by McNichols (2002) to obtain a better-specified expectations model which, in turn, should lead to a better specified stream of residuals.

Francis *et al*. (2005) add to the Dechow and Dichev (2002) model the growth in revenue in an attempt to reflect performance, and they add PPE, which expands the model to a broader measure of accruals that includes depreciation. Thus, Francis *et al*. (2005) develop a model to overcome the limitations of both models developed by Jones (1991) and Dechow and Dichev (2002). Francis *et al*. (2005) accruals quality measure is based on the Dechow and Dichev (2002) model, augmented with the fundamental variables from the Jones (1991) model. Thus, by adding additional variables that are expected to vary with nondiscretionary accruals reduce the extent of misspecification of the Jones model and its modified one. All variables are scaled by average total assets, consistent with Francis *et al*. (2005). Their model is as follows:

$$TCA_{it} = \beta_0 + \beta_1 CFO_{it-1} + \beta_2 CFO_{it} + \beta_3 CFO_{it+1} + \beta_4 \Delta Rev_{it} + \beta_5 PPE_{it} + \varepsilon_{it} \quad (4.21)$$

Where:

$TCA_{it}(Total\ Current\ Accruals) = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta Short\ term\ debt_{it}$
ΔRev_{it} =firm's changes in revenues between year $t-1$ and year t.
PPE_{it} = firm's gross value of Plant, Property and Equipment.

Consistent with Francis *et al*., Equation 4.21 is estimated based on the cross-sectional regression for every industry and year. Then, for every firm-year, each independent variable in Equation 4.21 is multiplied by the coefficients estimated for each year and industry to yield firm- and year-specific residuals, which form the basis for the accruals quality metric in this thesis.

Then, accruals quality is measured by calculating the standard deviation of firm's residuals over two years from $t-1$ to t. Although, Francis *et al.* (2005) use four years to calculate the standard deviation of firm's residuals, in this thesis only two years are used due to data limitation. The larger the standard deviation of residuals means the lower the accruals quality. The accruals quality measure (AQ) is as follows:

$$AQ_{it} = \sigma(\varepsilon_{it}) \tag{4.22}$$

4.5.1.3 Separating Accruals quality into Discretionary and Unintentional Factors

Dechow and Dichev (2002) model is based on the concept that accruals quality is affected by intentional and unintentional managerial errors in reported accounting numbers. On the one side, intentional estimation errors arise from opportunistic reasons, for example, hiding the true economic performance of the firm to improve the managers' welfare at the expense of the investors (Badertscher *et al*., 2012). On the other side, the unintentional errors arise from managerial lapses and operating environment uncertainty (Dechow and Dichev, 2002; Francis *et al.*, 2005). However, Dechow and Dichev model do not separately consider how accruals might be affected by intentional and unintentional managerial errors (McNichols, 2002; Francis *et al.*, 2005). Hence, the source of the estimation errors is irrelevant in the Dechow and Dichev model.

Francis *et al.* (2005) attempt to distinguish between poor accruals quality that arises from innate features of the firm's operating environment uncertainty and poor accruals quality that arises from managers' motivation towards discretion. They use factors suggested by Dechow and Dichev (2002) as affecting accruals quality unintentionally such as firm size, CFO volatility, sales volatility, firm operating cycle length, and frequency of reporting negative $EARN$.

Dechow and Dichev argue that smaller firms and longer operating cycles indicate greater uncertainty, more accruals estimation and greater errors of estimation. Further, they argue that higher operational volatility (CFO and sales volatility) is associated with a higher probability of unavoidable accruals estimation errors. For example, managers in unstable and volatile industries, even with good skills and the best intentions are expected to make larger accruals estimation errors. They also expect that losses are an indication of severe negative shocks in the firm's operating environment. Thus, accruals reactions to such shocks probably include significant estimation errors. All of these indicate greater uncertainty and likelihood of using estimation with corresponding large estimation errors which results in lower accruals and earnings quality.

Based on this argument, Francis *et al*. (2005) separate the unintentional and discretionary factors of accruals quality, using an annual regression of accruals quality on the innate components (firm size, CFO volatility, sales volatility, firm operating cycle length, and frequency of reporting negative $EARN$). The predicted values from the following regression show an estimate of the innate portion, while the error terms provide an estimate of the discretionary accruals. Thus, the components of accruals quality are as follows:

$$AQ_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it} + \mu_{it} \quad (4.23)$$

Where:

$SIZE_{it} =$ the natural logarithm of total assets for firm i and in year t.

$\sigma CFO_{it} =$ the standard deviation of firm's CFO over the past five years

$\sigma\ SALES_{it} =$ the standard deviation of firm's sales revenue over the past five years

$OperCycle_{it}$ is the natural logarithm of the firm's operating cycle in year t

$OperCycle_{it} = 360((\Delta\, A/R_{it})/(SALES_{it})) + 360((\Delta INV_{it})/(COGS_{it}))$

$NegEARN_{it} =$ the number of years out of the past five years, where firm reported $EARN$ < zero

Consistent with Francis *et al*., Equation 4.23 is estimated based on the cross-sectional regression for every industry and year in which the predicted values from Equation 4.23 give an estimate of the innate portion of firm's accrual quality which represents unintentional managerial errors in year t. This means that for each time t and firm i, the parameters are estimated using contemporaneous accounting data of firms in the same industry. This controls for the effects of changing industry-wide economic conditions and allows coefficients to vary across time (Kasznik, 1999). The innate potion of firm's accrual quality is estimated as follows:

$$Innate\_ACC_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 \, OperCycle_{it} + \beta_5 NegEARN_{it} \quad (4.24)$$

However, the residual from Equation 4.23 is the estimate of the discretionary accruals of a firm's accruals quality in year t which is estimated as follows:

$$DIS\_ACC_{it} = \widehat{\mu_{it}} \quad (4.25)$$

Therefore, the regression equation that measures the effect of discretionary accruals and unintentional managerial errors on the ability of $EARN$ to predict the one-year-ahead CFO is as follows:

$$ABSE_{i,t,Model\,1} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 Innate\_ACC_{it-1} + \varepsilon_{it} \quad (4.26)$$

Since the discretionary accruals and unintentional managerial errors are expected to affect $EARN$ through the ACC component not the CFO component, thus the regression equation that measures the effect of discretionary accruals and unintentional managerial errors on the contribution of ACC upon current CFO alone in predicting the one-year-ahead CFO is as follows:

$$ACC\_CONT_{it} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 Innate\_ACC_{it-1} + \varepsilon_{it} \qquad (4.27)$$

Where:

$$ACC\_CONT_{it} = ABSE_{i,t,Model\,2} - ABSE_{i,t,Model\,3}.$$

Thus, Equations 4.26 and 4.27 examine Hypotheses 5 and 7. Further analysis is conducted to examine the individual impact of the determinants of unintentional managerial errors which are proxied by five firm-specific characteristics, firm size, CFO volatility, sales volatility, firm operating cycle length, and frequency of reporting negative $EARN$ as suggested by Dechow and Dichev (2002) and Francis *et al*. (2005) on the predictive ability of $EARN$ and its components in order to examine Hypotheses 8 to 13. Thus, the regression equations examine the discretionary accruals and individual impact of the determinants of unintentional managerial errors on the predictive abilities of $EARN$ and CFO, and the contribution of ACC as follows:

$$ABSE_{it}^{m} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 SIZE_{it-1} + \beta_3 \sigma CFO_{it-1} + \beta_4 \sigma SALES_{it-1} + \beta_5\, OperCycle_{it-1} + \beta_6 NegEARN_{it-1} + \varepsilon_{it} \qquad (4.28)$$

Where:

m is Model 1 ($EARN$ prediction model) or Model 2 (CFO prediction model)

$$ACC\_CONT_{it} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 SIZE_{it-1} + \beta_3 \sigma CFO_{it-1} + \beta_4 \sigma SALES_{it-1} + \beta_5\, OperCycle_{it-1} + \beta_6 NegEARN_{it-1} + \varepsilon_{it} \qquad (4.29)$$

Recently, firms may have a willingness to shift from discretionary accruals to real management activities in manipulating earnings. The results of a survey by Graham *et al*. (2005) suggest that firms prefer real activities than discretionary accruals in managing earnings, possibly because these activities, while more costly, are probably harder to detect (Zang, 2012). Therefore, this thesis also investigates the effect of real earnings management on the predictive ability of $EARN$ and its components.

4.5.2 Real Activities Manipulation Measure

Roychowdhury (2006) explains that real activities-based earnings management can be conducted by three means: (i) sales manipulation; (ii) overproduction strategy; and/or (iii) reduction in discretionary expenditures. These real activities have direct cash flow consequences, and, in some cases, they affect accruals as well (Roychowdhury, 2006). However, few studies to date have examined the effect of these activities on the ability of $EARN$ and its components in predicting the $FCFO$. Most of the studies focus on the effect of discretionary accruals on the performance of cash flow prediction models. Therefore, the focus of this study is to fill this research gap.

This thesis relies on proxies of real earnings management activities developed by Roychowdhury (2006). He considers three metrics to study the level of real activities manipulations: the abnormal levels of CFO, abnormal production costs, and abnormal discretionary expenditure. Roychowdhury uses the model in Dechow *et al*. (1998) to derive normal levels of the CFO, productions costs, and discretionary expenditures for every firm-year. Deviations from the normal levels are termed as the abnormal CFO, abnormal production costs, and abnormal discretionary expenditures.

Firstly, Roychowdhury (2006) expresses the normal level of CFO as a linear function of sales and the change in sales in the current year, consistent with Dechow *et al*. (1998), as shown in Equation 4.30. Further, all the variables in the real earnings management are scaled by lagged total assets, consistent with Roychowdhury (2006), Cohen and Zarowin (2010) and Ho, Liao and Taylor (2015). Since it is common in real earnings management research to use lagged assets as a scaling factor, this approach is used. The normal CFO is estimated in this thesis based on the following cross-sectional regression for every industry and year, consistent with Roychowdhury (2006) and Cohen and Zarowin (2010).

$$CFO_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it}/TA_{it-1} + \alpha_3 \Delta SALES_{it}/TA_{it-1} + \varepsilon_{it} \tag{4.30}$$

Where:

TA_{it-1}= the total assets for firm i in year $t-1$.

For every firm-year, each independent variable in Equation 4.30 is multiplied by the coefficients estimated for each year and industry. Then, for every firm-year, the abnormal CFO is the difference between the actual CFO and the fitted CFO calculated using Equation 4.30.

Secondly, the abnormal level of production costs is used to measure the reduction in the $COGS$ through the overproduction of inventory since the fixed cost per unit declines with increasing the production volume. Production costs are defined as the sum of the $COGS$ and change in inventory during the year. Roychowdhury (2006) states that examining production costs instead of the $COGS$ has two advantages: First, discretionary accruals to reduce reported $COGS$ through the inventory account, for instance, by delaying write-offs of obsolete inventory, should not affect production costs. Consequently, production costs should primarily reflect the effects of real activities. Second, the inventory costing methods affect the reported $COGS$, but not production costs, due to offsetting effects on $COGS$ and inventory change. Consequently, Roychowdhury estimates both the $COGS$ and inventory to get the normal level of production. Expenses in the Dechow *et al*. (1998) model are expressed as a linear function of current sales. Following Dechow *et al*. (1998), Roychowdhury (2006) models the normal level of $COGS$ as a linear function of current sales which is estimated as follows:

$$COGS_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it}/TA_{it-1} + \varepsilon_{it} \quad (4.31)$$

Similarly, following Dechow *et al*. (1998), Roychowdhury (2006) models inventory growth as a linear function of the current and lagged change in sales is as estimated as follows:

$$\Delta INV_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 \Delta SALES_{it}/TA_{it-1} + \propto \alpha_3 \Delta SALES_{it-1}/TA_{it-1} + \varepsilon_{it} \quad (4.32)$$

The normal level of production costs in this thesis is estimated by combining Equations 4.31 and 4.32 to form cross-sectional regression model for every industry and year, similar to Roychowdhury (2006), Cohen and Zarowin (2010).

$$PROD_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it}/TA_{it-1} + \alpha_3 \Delta SALES_{it}/TA_{it-1} + \alpha_4 \Delta SALES_{it-1}/TA_{it-1} + \varepsilon_{it} \quad (4.33)$$

Where:

$PROD_{it}$= the sum of the $COGS$ in year t and the change in inventory from $t-1$ to t for firm i.

$\Delta SALES_{it-1}$= the change in net sales from year $t-2$ to $t-1$ for firm i.

Thirdly, the abnormal level of discretionary expenditures is used to measure the reduction in such expenditures to manage earnings upward. Following Dechow *et al*. (1998), discretionary expenditures should be also expressed as a linear function of current sales, similar to the $COGS$. The relevant regression would then be:

$$DISEXP_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it}/TA_{it-1} + \varepsilon_{it} \qquad (4.34)$$

Where:

$DISEXP_{it}$ is discretionary expenditures (the sum of selling, general, and administrative expenditures) for firm i in year t.

Modelling discretionary expenditures as a function of current sales creates a mechanical issue if firms manage sales upwards to increase reported earnings in a certain year, resulting in unusually lower residuals from the above regression in that year, even when they do not decrease discretionary expenditures. To avoid this issue, Roychowdhury (2006) models discretionary expenditure as a function of lagged sales. Thus, the normal level of discretionary expenditures in this thesis is estimated based on the following cross-sectional regression for every industry and year, similar to Roychowdhury (2006), Cohen and Zarowin (2010).

$$DISEXP_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it-1}/TA_{it-1} + \varepsilon_{it} \qquad (4.35)$$

Equations 4.30, 4.33 and 4.35 are estimated at cross-section for each industry and year for at least eight observations. Thus, for every firm-year, each independent variable in Equations 4.30, 4.33 and 4.35 is multiplied by the coefficients estimated for each year and industry. Thus, the right hand side variables of these equations are only estimated for the purpose of computing the dependent variables to get the normal levels of CFO, production and discretionary expenditure for every year t and firm i. Then, the abnormal CFO (AB_CFO), abnormal production (AB_PROD) and abnormal discretionary expenditures (AB_DISEXP) are computed as the difference between the actual values of these three variables and the normal level predicted from Equations 4.30, 4.33 and 4.35. Then, these three variables are used as proxies for real-activities based earnings management.

In order to capture the effects of real management activities through all these three variables in a comprehensive measure, a single variable is computed by combining the three individual real earnings management variables. Therefore, RM_PROXY is as the sum of the standardized variables of AB_CFO, AB_PROD and AB_DISEXP, consistent with Cohen *et al*. (2008) and Kuo *et al.* (2014) as follows:

$$RM\_PROXY_{it} = -AB\_CFO_{it} - AB\_DISEXP_{it} + AB\_PROD_{it} \qquad (4.36)$$

Given sales levels, firms that manage earnings upward are likely to have one or all of these: unusually low CFO, and/or unusually low discretionary expenditures, and/or unusually high production costs. Following Cohen and Zarowin (2010) and Kuo *et al.* (2014), AB_CFO and AB_DISEXP are multiplied by negative one to facilitate interpretation. Thus, the higher AB_CFO, AB_DISEXP, and AB_PROD, the more likely that the firm is engaged in sales manipulation, cutting discretionary expenditures and overproduction strategy to manage earnings upward.

As result, this means that the larger value of RM_PROXY suggests a greater use of real management activities to manage earnings. Each of the three individual variables has different implications for earnings that may dilute any results using RM_PROXY alone

(Cohen *et al.*, 2008). Thus, the effect of the single measure RM_PROXY as well as the three individual real earnings management proxies (AB_CFO, AB_PROD and AB_DISEXP) on the predictive abilities of $EARN$, CFO and ACC is examined. Therefore, the regression equations measure the effect of comprehensive measure RM_PROXY on the predictive abilities of $EARN$ and CFO, and the contribution of ACC over CFO are as follows:

$$ABSE_{it}^{m} = \beta_0 + \beta_1 RM\_PROXY_{it-1} + \varepsilon_{it} \quad (4.37)$$

Where:
m is Model 1 ($EARN$ prediction model) or Model 2 (CFO prediction model)

$$ACC\_CONT_{it} = \beta_0 + \beta_1 RM\_PROXY_{it-1} + \varepsilon_{it} \quad (4.38)$$

While the following regression equations measure the effect of the three real management variables individually (AB_CFO, AB_PROD and AB_DISEXP) on the predictive abilities of $EARN$ and CFO, and the contribution of ACC over CFO as follows:

$$ABSE_{it}^{m} = \beta_0 + \beta_1 AB\_CFO_{it-1} + \beta_2 AB\_PROD_{it-1} + \beta_3 AB\_DISEXP_{it-1} + \varepsilon_{it} \quad (4.39)$$

$$ACC\_CONT_{it} = \beta_0 + \beta_1 AB\_CFO_{it-1} + \beta_2 AB\_PROD_{it-1} + \beta_3 AB\_DISEXP_{it-1} + \varepsilon_{it} \quad (4.40)$$

Therefore, Equations 4.37 to 4.40 examine Hypothesis 6, whether the real activities manipulation has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.

4.6 Accounting Conservatism

Kim and Kross (2005) find a strengthening relationship between current $EARN$ and $FCFO$ for firms in industries that became increasingly conservative in their accounting. However, they find that the relationship between $EARN$ and $FCFO$ is substantially unchanged over the sample period for firms in industries that had either stable or decreasing accounting conservatism. Consistent with Kim and Kross, Bandyopadhyay *et al*. (2010) provide evidence that an increasing level of accounting conservatism has led to increase the ability of current $EARN$ to predict $FCFO$.

Although there are some studies that examine the ability of current $EARN$ in predicting the $FCFO$ in the MENA region firms (e.g., Telmoudi *et al*., 2010; Ebaid, 2011; Hammami, 2012), yet there have been relatively few or no studies that investigate the impact of accounting conservatism on its predictive ability. Thus, this thesis aims to fill this gap by examining the effect of conditional and unconditional conservatism on the ability of current $EARN$ and also ACC to predict one-year-ahead CFO.

4.6.1 Conditional and Unconditional Conservatism Measures

Despite the lack of an ideal measure for accounting conservatism, there is an extensive literature that provides a wide variety of approaches that attempt to measure conservatism from different perspectives (Givoly, Hayn and Natarajan, 2007). For example, Basu's (1997) asymmetric earnings-timeliness measure, Givoly and Hayn's (2000) cumulative non-operating accruals measure, and Penman and Zhang's (2002) hidden-reserves measure. This thesis employs the most widely used models in the accounting conservatism literature which are the Basu (1997) model as modified by Khan and Watts (2009) and the Givoly and Hayn (2000) model.

Although Basu (1997) and Givoly and Hayn (2000) did not classify their measures of conservatism as conditional and unconditional, Chen *et al.* (2014) argue that the measure employed by Basu (1997) is a measure of conditional conservatism while the measure of Givoly and Hayn's (2000) can be used a measure of unconditional conservatism. Thus, consistent with Chen *et al.*, this thesis classifies conservatism into conditional as measured by Basu (1997) and modified by Khan and Watts (2009) which is the firm-year asymmetric earnings-timeliness measure, and unconditional as measured by Givoly and Hayn's (2000) which is the cumulative non-operating accruals.

4.6.1.1 Conditional Conservatism Measure

The first accounting conservatism measure used in the thesis is the firm-year Basu (1997) asymmetric earnings-timeliness measure, as modified by Khan and Watts (2009) to capture the effect of conditional conservatism, consistent with Chen *et al*. (2014). Basu defines conservatism as the accountant's tendency to require a higher degree of verification for recognizing positive economic performance or good news as gains than for recognizing negative economic performance or bad news as losses. Since annual stock returns capture arrival of new information within the year, then Basu uses stock returns as a proxy for good and bad news: negative returns are a proxy for 'bad news' and positive returns are a proxy for 'good news'. In his model, he runs a regression of annual earnings on current annual stock returns. Basu expects and finds a higher association of earnings with negative returns (bad news) than with positive returns (good news). This differential response is called the asymmetric timeliness of earnings and it is used as a measure of conservatism. The Basu cross-sectional regression is specified as follows:

$$X_{it} = \beta_0 + \beta_1 D_{it} + \beta_2 R_{it} + \beta_3 D_{it} R_{it} + \varepsilon_{it} \qquad (4.41)$$

Where:

X_{it}= firm's earnings before extraordinary items per share for year t, scaled by firm's stock price per share at the beginning of year t;

R_{it}= firm's annual stock return from nine months before fiscal year-end t to three months after fiscal year-end t;

D_{it}= a dummy variable equal to 1 when $R_{it} < 0$ and equal to 0 otherwise.

The good news timeliness measure is β_2. The measure of incremental timeliness for bad news over good news, or conservatism, is β_3. Under the Basu measure, β_3 is predicted to be positive and significant. Larger $\beta_3$coefficients indicate more conditional conservatism. Although Basu measure of accounting conservatism is widely used and considered as one of the significant measures of conservatism, this measure faces severe criticism (Dietrich, Muller and Riedl, 2007; Givoly *et al*., 2007; Khan and Watts, 2009). Specifically, one of the criticisms facing the Basu (1997) measure is that it cannot provide firm-specific measurements (Khan and Watts, 2009). Khan and Watts suggest that Basu's (1997) measure is limited because it is estimated either on industry-year using a cross-section of firms within the same industry or on a firm-specific basis using time-series observations and both estimation methods have limitations. The cross-sectional basis assumes all firms in the same industry are homogeneous, while the time-series assumes the firm's operating characteristics are stationary. However, Khan and Watts (2009) argue that a lot of changes that affect a firm's financial reporting conservatism are likely to be related to time and firm specific characteristics.

Consequently, Khan and Watts (2009) develop a conditional conservatism measure to meet the researchers' demand for a firm-level measure of conservatism that can reflect the variations of conservatism across firms within the same industry and across time. Thus, they fill a gap in the literature by developing a simple methodology for estimating a firm-year measure of conservatism. Further, they provide evidence on its empirical properties as a metric, and thus it has been used by many studies (e.g., Goh and Li, 2011; Ahmed and Duellman, 2012; Chen *et al*., 2014; Lu and Trabelsi, 2013; Kim and Zhang, 2016; Lara, Osma and Penalva, 2016).

Khan and Watts (2009) estimate the cross-sectional Basu (1997) regression annually to allow the asymmetric timeliness coefficient to vary across the following firm characteristics: firm size, market-to-book ratio, and leverage. These characteristics have been found theoretically and empirically to vary with accounting conservatism (LaFond and Watts, 2008; Khan and Watts, 2009; Ahmed and Duellman, 2012; Lara *et al*., 2016). LaFond and Watts (2008) and Khan and Watts (2009) argue that larger firms are probably more mature and having richer information environments. Thus, they argue that these firms produce more public information thus decreasing both uncertainty and information asymmetries between managers and outside investors, which in turn, reduce the demand for conservatism accounting. Consistent with their argument, LaFond and Watts (2008), Goh and Li (2011), Ahmed and Duellman (2012) and Lara *et al*. (2016) find that larger firms have less conservative accounting.

Moreover, Cano-Rodríguez (2010) argue that leverage is initially expected to be associated with conservatism because banks and other lenders will demand conservatism in companies with higher rates of leverage. Khan and Watts (2009) and Ahmed, Billings, Morton and Stanford-Harris (2002) argue that highly leveraged firms tend to have agency conflicts between bondholders and shareholders that, in turn, increase the demand for conservatism. Consistent with their argument, Ahmed *et al*. (2002), Goh and Li (2011), Ahmed and

Duellman (2012) and Lara *et al*. (2016) find that when these conflicts are severe, which implies high leverage, firms accounting choices tend to be more conservative.

Market-to-book ratio has a direct relationship with conservatism and sometimes it is used as a proxy for the degree of conservatism (e.g., Beaver and Rayan, 2000; Ahmed *et al*., 2002). Market-to-book value ratio captures the extent to which the book value is always lower than market value (Ahmed *et al*., 2002). The asymmetric verification requirements for gains versus losses over a period of time build up a cumulative understatement of net assets relative to market values, which implies greater market-to-book value (Roychowdhury and Watts, 2007; Khan and Watts, 2009), and thus higher level of conservatism.

Khan and Watts (2009) use these firm characteristics to measure the level of conditional accounting conservatism for each firm yearly. They argue that the chosen firm characteristics maintain the maximum number of observations. They argue that the fewer variables used in estimation models, the more firm-years and thus larger samples available to researchers. Thus, despite the wide number of variables available to measure conservatism, they limit the estimation to the above mentioned three independent variables for reasons of parsimony. To estimate the timeliness with which accounting reflects both good news and bad news at the firm-year level, they specify that both the timeliness of good news (which is referred to as G_SCORE) each year and the incremental timeliness of bad news (which is referred to as C_SCORE) each year. To calculate C_SCORE and G_SCORE, β_2 and β_3 in Equation 4.41 are replaced by Equations 4.42 and 4.43 respectively that are linear functions of firm-specific characteristics each year:

$$\beta_2 = \mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it} \tag{4.42}$$

$$\beta_3 = \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it} \tag{4.43}$$

Where:

$SIZE2_{it}$= the natural logarithm of market value of equity at the end of year t for firm i.

M/B_{it}= the ratio of market value of equity to book value of equity at the end of year t for firm i.

LEV_{it}= the ratio of total liabilities to market value of equity at the end of year t for firm i.

Equations 4.42 and 4.43 are not regression models. Instead, Khan and Watts substitute them into the Basu (1997) model as shown in Equation 4.41 to obtain Equation 4.44 below. The empirical estimators of μ and λ in Equation 4.44 shown below are constant across firms, but vary over time since they are estimated from annual cross-sectional regressions. Thus, C_SCORE and G_SCORE vary across firms through cross-sectional variation in the firm-year characteristics ($SIZE2$, M/B and LEV), and over time through inter-temporal variation in λ_{it} and μ_{it}. C_SCORE is the firm-year measure of conservatism. The main focus of this thesis is C_SCORE rather than G_SCORE because conditional conservatism is increasing in C_SCORE. The annual cross-sectional regression model used to estimate C_SCORE and G_SCORE is:

$$X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it} \tag{4.44}$$

Equation 4.44 results from substitution of equations 4.42 and 4.43 into 4.41, including additional terms in the last parenthesis. They include additional terms because regression model 4.44 includes interaction terms between returns and firm characteristics, so they also control for the firm characteristics separately. In this thesis, Equation 4.44 is estimated annually for all firms in the same industry to obtain λ_i, i=1-4. Then, C_SCORE which represents conditional conservatism ($CONCOS$) is then obtained using Equation 4.43 for each year t and firm i. A higher C_SCORE implies a higher sensitivity of earnings to negative returns than to positive returns and, thus, increased conditional accounting conservatism. Therefore, the regression equations that will measure the effect of conditional conservatism on the ability of $EARN$ and the contribution of ACC in predicting the one-year-ahead CFO in order to examine Hypothesis 14 are as follows:

$$ABSE_{i,t,Model\,1} = \beta_0 + \beta_1 CONCOS_{it-1} + \varepsilon_{it} \quad (4.45)$$

$$ACC\_CONT_{i,t} = \beta_0 + \beta_1 CONCOS_{it-1} + \varepsilon_{it} \quad (4.46)$$

4.6.1.2 Unconditional Conservatism Measure

The second accounting conservatism measure used in this thesis is the cumulative non-operating accruals developed by Givoly and Hayan (2000) to capture the unconditional conservatism, consistent with Chen *et al*. (2014). This measure is used similar to Kim and Kross (2005) and Bandyopadhyay *et al*. (2010). Givoly and Hayn (2000) focus on the financial statements effects of conservatism over a long period of time. They argue that unbiased accounting results in the cumulative amount of net income before depreciation and amortization that would converge in the long run to CFO. Thus, as both positive and negative accruals reverse over time, net cumulative accruals should approach zero which means that the accounting accruals of firms in a steady state with neither growth nor conservatism are mean-reverting over time. In contrast, conservative accounting results in a persistent pattern of negative accruals over time. This suggests that the accumulation of negative accruals over a reasonably long period provides an accounting based firm-specific proxy for conservatism.

Based on their argument, Givoly and Hayn (2000) suggest that a significant accumulation of negative non-operating accruals specifically over the time summarizes the underestimate of assets and income. Thus, they predict that conservatism operates through the accrual component, especially non-operating accruals. They define operating accruals as those arising from the basic day-to-day business of the firm (e.g., $\Delta A/R, \Delta\, INV$, etc.), while non-operating accruals are the remainder. Thus, non-operating accruals mainly contain elements that can capture the conservatism practices more than operating accruals such as loss provisions on receivables, restructuring charges, asset write-downs, the change in the accounting estimates, gains or losses on the sale of assets, capitalization of expenses, and the deferral of revenues and their subsequent recognition. Non-operating accruals are the difference between total accruals before depreciation and operating accruals. Total accruals before depreciation and operating accruals are calculated as follows, consistent with Givoly and Hayn (2000):

$$Total\ ACC\ before\ DEP_{it} = (Net\ Income_{it} + DEP_{it}) - CFO_{it} \qquad (4.47)$$

$$Operating\_ACC_{it} = \Delta A/R_{it} + \Delta INV_{it} + \Delta Prepaid\ Expenses_{it} - \Delta A/P_{it} - \Delta Taxes\ Payable_{it} \qquad (4.48)$$

where, net income is defined in this thesis as the bottom line net income (i.e., income after gains or losses from discontinued operations and extraordinary items), consistent with Givoly and Hayn (2000). In this thesis, non-operating accruals for each firm is accumulated over the past five years and scaled by total assets at the beginning of the period, consistent with Chen *et al*. (2014). The extent that accumulated non-operating accruals over a specific period deviate negatively from zero indicates the degree of unconditional conservatism during the period. The accumulated non-operating accruals are then multiplied by negative one for ease of interpretation. Thus, the measure of unconditional conservatism is as follows:

$$UNCONCOS_{it} = \frac{Non\!-\!operating\ ACC_{it}}{Sum\ of\ assets\ at\ the\ begining\ of\ the\ period_{it}} * (-1) \tag{4.49}$$

Therefore, the regression equations that measure the effect of unconditional accounting conservatism on the ability of $EARN$ and the contribution of ACC in predicting the one-year-ahead CFO in order to examine Hypothesis 15 are as follows:

$$ABSE_{i,t,Model\ 1} = \beta_0 + \beta_1 UNCONCOS_{it-1} + \varepsilon_{it} \tag{4.50}$$

$$ACC\_CONT_{i,t} = \beta_0 + \beta_1 UNCONCOS_{it-1} + \varepsilon_{it} \tag{4.51}$$

In conclusion, to test the predictive ability of $EARN$ and its components in the MENA region firms and test the different factors that might affect their abilities, Table 4.4 summarises the main hypotheses of this thesis along with the models that are used to test them. Specifically, the first six models are used to test different prediction models that either use aggregate $EARN$ or aggregate CFO or disaggregated versions of these two variables. While, the remaining models aim to test the factors that affect the predictive ability of $EARN$ and its components which are discretionary accruals, unintentional managerial errors, real activities manipulation and conditional and unconditional conservatism.

Table 4.4: Summary of Research Models and Hypotheses

Model	Hypothesis Tested	Section Reference
Model 1: $CFO_{it+1} = \beta_0 + \beta_1 EARN_{it} + \varepsilon_{it+1}$	H3	2.6.2
Model 2: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it+1}$	H3	2.6.2
Model 3: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 ACC_{it} + \varepsilon_{it+1}$	H2.1	2.6.1
Model 4: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 \Delta A/R_{it} + \beta_3 \Delta INV_{it} + \beta_4 \Delta A/P_{it} + \beta_5 DEP_{it} + \beta_6 ACCOTHERS_{it} + \varepsilon_{it+1}$	H2.2	2.6.1
Model 5: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4 CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \varepsilon_{it+1}$	H1	2.4.1
Model 6: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4 CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \beta_7 \Delta A/R_{it} + \beta_8 \Delta INV_{it} + \beta_9 \Delta A/P_{it} + \beta_{10} DEP_{it} + \beta_{11} ACCOTHERS_{it} + \varepsilon_{it+1}$	H4	2.6.3
$ABSE_{i,t,Model\ 1} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 Innate\_ACC_{it-1} + \varepsilon_{it}$	H5 and H7	3.2.3.1 and 3.2.4
$ACC\_CONT_{it} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 Innate\_ACC_{it-1} + \varepsilon_{it}$	H5 and H7	3.2.3.1 and 3.2.4
$ABSE^{m}_{it} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 SIZE_{it-1} + \beta_3 \sigma CFO_{it-1} + \beta_4 \sigma SALES_{it-1} + \beta_5 OperCycle_{it-1} + \beta_6 NegEARN_{it-1} + + \varepsilon_{it}$	H8 to H13	3.2.4.1
$ACC\_CONT_{it} = \beta_0 + \beta_1 DIS\_ACC_{it-1} + \beta_2 SIZE_{it-1} + \beta_3 \sigma CFO_{it-1} + \beta_4 \sigma SALES_{it-1} + \beta_5 OperCycle_{it-1} + \beta_6 NegEARN_{it-1} + \varepsilon_{it}$	H8 to H13	3.2.4.1
$ABSE^{m}_{it} = \beta_0 + \beta_1 RM\_PROXY_{it-1} + \varepsilon_{it}$	H6	3.2.3.2
$ACC\_CONT_{i,t} = \beta_0 + \beta_1 RM\_PROXY_{it-1} + \varepsilon_{it}$	H6	3.2.3.2
$ABSE^{m}_{it} = \beta_0 + \beta_1 AB\_CFO_{it-1} + \beta_2 AB\_PROD_{it-1} + \beta_3 AB\_DISEXP_{it-1} + \varepsilon_{it}$	H6	3.2.3.2
$ACC\_CONT_{i,t} = \beta_0 + \beta_1 AB\_CFO_{it-1} + \beta_2 AB\_PROD_{it-1} + \beta_3 AB\_DISEXP_{it-1} + \varepsilon_{it}$	H6	3.2.3.2
$ABSE_{i,t,Model\ 1} = \beta_0 + \beta_1 CONCOS_{it-1} + \varepsilon_{it}$	H14	3.3.3
$ACC\_CONT_{i,t} = \beta_0 + \beta_1 CONCOS_{it-1} + \varepsilon_{it}$	H14	3.3.3
$ABSE_{i,t,Model\ 1} = \beta_0 + \beta_1 UNCONCOS_{it-1} + \varepsilon_{it}$	H15	3.3.3
$ACC\_CONT_{i,t} = \beta_0 + \beta_1 UNCONCOS_{it-1} + \varepsilon_{it}$	H15	3.3.3

4.7 Conclusion

In conclusion, to address the research questions, this thesis uses in-sample regression analysis and out-of-sample prediction tests to examine which from $EARN$ or CFO is superior in predicting the one-year-ahead CFO, and whether disaggregating $EARN$, CFO

and ACC to their components enhance their predictive ability for companies in the ten MENA region countries which are Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates over the period 2005-2018. The in-sample regression analysis depends on comparing the adjusted R-squared statistics of six prediction models, along with the AIC, BIC and bootstrapping to determine which is superior in predicting the one-year-ahead CFO. The out-of-sample prediction tests compute an error metric to assess the predictive ability of each model which is the absolute prediction error ($ABSE$), similar to Nam *et al*. (2012).

Then, a regression analysis is used to model the impact of earnings management, unintentional managerial errors, and accounting conservatism on the ability of $EARN$ and its components to predict the one-year-ahead CFO. Hence, the dependent variable is the $ABSE$ from $EARN$ and CFO prediction model in addition to the accruals contribution over the CFO alone in predicting the one-year-ahead CFO. The independent variables are as follows: discretionary accruals and real activities manipulation which represents intentional earnings management, unintentional managerial errors in estimating accruals, and finally conditional and unconditional accounting conservatism.

Discretionary accruals are the independent variable for the accrual-based earnings management. Discretionary accruals are measured through the accruals quality measure developed by Dechow and Dichev (2002) and modified by Francis *et al*. (2005) to capture accrual-based earnings management. Although the modified Jones model is the most widely measure for discretionary accruals, this thesis uses the modified Dechow and Dichev model instead because it can differentiate between discretionary accruals and unintentional managerial errors. The abnormal level of CFO, abnormal production costs and abnormal discretionary expenditures are used as independent variables for the real activities-based earnings management models. In addition to this, one aggregate proxy is employed as independent variable of real activities-based earnings management.

Finally, this thesis employs the most widely used models in the accounting conservatism literature which are the Basu (1997) model and the Givoly and Hayn (2000) model, to examine the effect of conditional and unconditional conservatism on the predictive ability of $EARN$ and its components. On the one hand, conditional conservatism is measured by firm-year Basu (1997) asymmetric earnings-timeliness measure, as modified by Khan and Watts (2009). On the other hand, the unconditional conservatism is measured by cumulative non-operating accrual measure developed by Givoly and Hayn (2000).

The variables of this thesis either dependent or independent variables are computed from the income statement, balance sheet, and statement of cash flows. Thus, this thesis uses secondary data for the firm-specific variables. The data for these variables are extracted from the financial database, the Refinitiv *Datastream*, for non-financial firms listed on the stock exchanges of the ten MENA region countries. In the next chapter, the data analysis and empirical results of the cash flow prediction models are provided.

Chapter 5

Results of Cash Flow Prediction Models

5.1 Introduction

This chapter aims to present the empirical results of this thesis and test the hypotheses related to cash flow prediction models. In this chapter, six prediction models are examined to identify which of these models provide superior prediction of the one-year-ahead CFO in the MENA region firms through using in-sample and out-of-sample prediction tests. First, this chapter compares the explanatory power of the six prediction models via the adjusted R-squared statistics estimated using the PRM and the FEM for a sample period of 2005-2018. Specifically, this chapter starts with employing the PRM to examine the abilities of $EARN$, CFO, ACC and their disaggregated components in predicting the one-year-ahead CFO. Then, this chapter re-examines the prediction models using the FEM which allows for firm-specific variations in cash flow data to analyse whether the main conclusions are affected by the regression model employed in the analysis.

Second, given the criticisms facing the in-sample regression analysis, this chapter re-evaluates the predictive ability of the six prediction models using the out-of-sample prediction tests which is considered a more accurate technique compared to the in-sample regression analysis. Specifically, Kim and Kross (2005) argue that the higher adjusted R-squared statistics, which is the main analysis tool in the in-sample regression analysis, may not imply relatively good prediction performance due to over-fitting the data.

To sum up, this chapter aims to answer the first research question of this thesis which is the role of $EARN$, CFO and ACC along with their disaggregated components in predicting the one-year-ahead CFO for firms in the MENA region. The first set of hypotheses suggests that the ability of current CFO is superior compared to current aggregate $EARN$ in predicting the one-year-ahead CFO. The second set of hypotheses suggests that disaggregating $EARN$, CFO and ACC into their major components enhance their ability when predicting the one-year-ahead CFO.

The outline of this chapter is as follows. Section 5.2 provides the descriptive statistics for the variables of the cash flow prediction models. Section 5.3 presents and discusses the correlation analysis between all the variables used in this chapter. Section 5.4 presents the results of in-sample regression analysis for each of the six prediction models and reports a comparison between the explanatory power of these models to identify which of these models provides superior prediction of the one-year-ahead CFO. Section 5.5 discusses the predictive ability of the six models using the out-of-sample test. Finally, Section 5.6 concludes.

5.2 Descriptive Statistics

The aim of this section is to present the descriptive statistics of the main variables employed in this chapter. Table 5.1 presents a summary of descriptive statistics for the variables used in the cash flow prediction models. The mean, median, standard deviation, minimum and maximum values are shown for the dependent and independent variables. In order to compare the prediction models with each other and avoid the confounding impact that may arise due to using a sample of observations pertaining to different firms, the sample is restricted to firm-years with complete data throughout the sample period.

Table 5.1: Descriptive Statistics for the Variables of the Cash Flow Prediction Models

	GCC					Non-GCC						MENA Region				
Variables	**Mean**	**Median**	**SD**	**Min**	**Max**	**Mean**	**Median**	**SD**	**Min**	**Max**	**t-statistics**	**Mean**	**Median**	**SD**	**Min**	**Max**
CFO	0.090	0.083	0.088	-0.253	0.398	0.058	0.052	0.089	-0.256	0.397	12.18***	0.077	0.069	0.090	-0.256	0.398
$EARN$	0.061	0.056	0.078	-0.270	0.320	0.031	0.030	0.079	-0.262	0.320	12.63***	0.049	0.046	0.079	-0.270	0.320
ACC	-0.029	-0.030	0.069	-0.303	0.322	-0.027	-0.028	0.078	-0.298	0.327	-1.28	-0.028	-0.029	0.073	-0.303	0.327
$\Delta A/R$	0.009	0.005	0.050	-0.264	0.270	0.005	0.002	0.060	-0.285	0.269	2.35**	0.008	0.004	0.054	-0.285	0.270
ΔINV	0.005	0.001	0.035	-0.193	0.234	0.002	0.000	0.050	-0.200	0.234	2.52***	0.003	0.000	0.041	-0.200	0.234
$\Delta A/P$	0.004	0.001	0.036	-0.176	0.221	0.005	0.001	0.043	-0.172	0.221	-0.42	0.004	0.001	0.039	-0.176	0.221
DEP	0.037	0.034	0.023	0.000	0.131	0.031	0.027	0.023	0.000	0.135	8.92***	0.035	0.031	0.023	0.000	0.135
$ACCOTHERS$	-0.002	-0.002	0.054	-0.271	0.341	0.002	0.000	0.068	-0.366	0.362	-2.30**	0.000	-0.001	0.060	-0.366	0.362
$CSHRD$	0.588	0.464	0.439	-0.028	2.914	0.598	0.535	0.437	-0.038	2.839	-0.75	0.592	0.495	0.438	-0.038	2.914
$CSHPD$	0.493	0.370	0.431	-0.171	2.863	0.509	0.432	0.419	-0.160	2.730	-1.23	0.500	0.394	0.426	-0.171	2.863
$CSHTAX$	0.002	0.000	0.005	0.000	0.044	0.003	0.000	0.008	0.000	0.050	-4.25***	0.003	0.000	0.006	0.000	0.050
$CSHINTIN$	0.001	0.000	0.002	0.000	0.016	0.001	0.000	0.002	0.000	0.016	0.54	0.001	0.000	0.002	0.000	0.016
$CSHINTPD$	0.003	0.000	0.007	0.000	0.038	0.002	0.000	0.007	0.000	0.038	4.58***	0.003	0.000	0.007	0.000	0.038
$CSHOTHERS$	0.000	0.000	0.103	-0.448	0.490	-0.026	-0.021	0.106	-0.446	0.504	8.50***	-0.010	-0.008	0.105	-0.448	0.504
Number of Observations	2,732					1,824						4,556				

This table presents the descriptive statistics for the variables of the cash flow prediction models. The mean, median, standard deviation, minimum and maximum values are presented in the columns for the GCC country firms, non-GCC country firms, and the MENA region combined. The t-statistics column reports the t-statistics to identify any potential significant differences in means for each of the variables between GCC and non-GCC country firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Non-GCC countries include Egypt, Jordan, Morocco, and Tunisia. Variables definitions: CFO is net cash flows from operating activities as reported in the statement of cash flows. $EARN$ is net (after tax) earnings before extraordinary items and discontinued operations. ACC is difference between $EARN$ and CFO. $\Delta A/R$ is the change in accounts receivable during a year. ΔINV is the change in inventory during a year. $\Delta A/P$ is the change in accounts payable during a year. DEP is depreciation and amortization. $ACCOTHERS$ is other accruals calculated as follows $EARN - (CFO + \Delta A/R + \Delta INV - \Delta A/P - DEP)$. $CSHRD$ is estimated cash received from customers and calculated as follows $CSHRD = SALES - \Delta A/R$. $CSHPD$ is estimated cash paid to suppliers and employees and calculated as follows $CSHPD = COGS - DEP + Selling\ and\ Admin\ Expenses + \Delta INV - \Delta A/P + \Delta other\ CA - \Delta other\ CL$. $CSHTAX$ is disclosed cash related to tax payments. $CSHINTIN$ is disclosed cash related to interest income. $CSHINTPD$ is disclosed cash related to interest payments. $CSHOTHERS$ is other operating cash flows calculated as $CFO - (CSHRD - CSHPD - CSHTAX + CSHINTIN - CSHINTPD)$. All the variables are scaled by average total assets. All variables are trimmed at the 1 percent and 99 percent levels. The sample used in this chapter contains 4,556 observations over 2005–2018.

Table 5.1 presents descriptive statistics for the final sample, which comprises 4,556 firm-year observations for 853 MENA region firms in ten industries spanning 14-year period from 2005 to 2018. Given that this thesis focuses on the MENA region, the descriptive statistics are presented for the MENA region firms as a whole as well as for GCC and non-GCC country firms separately to explore any potential significant differences in means for each of the variables between these two areas using a two tailed t-test. The GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The non-GCC countries include Egypt, Jordan, Morocco, and Tunisia.

Table 5.1 shows that although there are some similarities between the GCC and non-GCC countries, there are also significant differences between both areas as is apparent from the differences in the mean values of CFO, $EARN$, $\Delta A/R$, ΔINV, DEP, $ACCOTHERS$, $CSHTAX$, $CSHINPD$ and $CSHOTHERS$. These significant differences might be due to two reasons. First, the Arab MENA region is an economically diverse region, whose countries show wide dispersions with respect to economic development and business culture inheritance (Sourial, 2004; Naciri, 2008; Othman and Zeghal, 2010; Moumen *et al*., 2013).

Second, the accounting standards applied in each country might be another reason for the major differences between these two areas (Othman and Zeghal, 2010). According to the *OSIRIS* database, it is found nowadays that the majority of the GCC country firms are applying the IFRS in their financial reporting, while the majority of non-GCC country firms are applying domestic accounting standards that are similar to the US GAAP. For the GCC country firms, 4% of the firms prepared their financial statements according to the IFRS in 2005, while this percentage gradually increased to reach 94% in 2018. However, 33% only of the non-GCC country firms are using the IFRS as an accounting standard in

2018, and this percentage is mainly due to the Jordanian companies. However, most of the Egyptian, Moroccan and Tunisian companies are still reporting and preparing their financial statements using domestic accounting standards equivalent to the US GAAP.

Despite the above mentioned differences between the MENA region countries, they still share some common characteristics. Specifically, they are characterized by accounting standards that are issued by government decree, the monitoring bodies in these countries do not have effective control, and their domestic accounting standards are not totally consistent with the IFRS or the US GAAP, and generally looser forms of regulation (Anandarajan and Hasan, 2010). Thus, international economic and academic organizations still group these countries together due to their similar features with respect to religion, culture and demographic characteristics in addition to weak law enforcement, pervasive corruption, lack of accountability and transparency and low levels of enterprise creation in these countries (O'Sullivan, Rey and Mendez, 2011; McKee, Keulertz, Habibi, Mulligan and Woertz, 2017).

Thus, since the MENA region is the main focus of this thesis, all the tests in this chapter are conducted for the MENA region firms as a whole. Then, all the tests are repeated on two separate sub-samples for GCC and non-GCC country firms to reduce the possibility that different results across the sub-samples are masked at the full sample level.

Table 5.1 reveals that the mean and median of all the variables used in the cash flow prediction models are positive for both the GCC and non-GCC country firms except the mean and median of ACC , similar to Barth *et al*. (2001), Al-Attar and Hussain (2004) and Farshadfar and Monem (2013b). As explained in Barth *et al*. (2001), the negative mean and median of ACC is most likely driven by long-term accruals (i.e. DEP) which is much larger than total short-term accruals excluding $ACCOTHERS$ ($\Delta A/R + \Delta INV - \Delta A/P$) for both the GCC and non-GCC country firms. This suggests that total ACC is greatly affected by long-term accruals. Despite, short-term accruals are smaller in magnitude; they are being more volatile compared to long-term accruals.

Moreover, the sign of $ACCOTHERS$ and $CSHOTHERS$ are mixed across the GCC and non-GCC country firms, however, these variables are of less interest than the other CFO and ACC components as they are merely residual values. Nonetheless, the main implication that can be derived from the signs of both variables in both the GCC and non-GCC country firms is as follows. Since $ACCOTHERS$ has positive mean and median for the non-GCC country firms, this indicates that the changes in liabilities, and depreciation and amortization are greater than the changes in assets. This, in turn, justifies the negative mean and median of $CSHOTHERS$ in the non-GCC country firms which suggests more other sources of cash outflows than inflows. However, $ACCOTHERS$ has negative mean and median in the GCC country firms, the $CSHOTHERS$ has mean and median of zero for the GCC country firms.

The mean value of CFO is greater than that of the $EARN$ in both magnitude and volatility in the GCC and non-GCC country firms. The $EARN$ has a lower mean compared to the CFO because it is reduced by non-cash expenses such as depreciation and amortization (Dechow *et al*., 1998), whereas the CFO is calculated by adding those non-cash expenses back to earnings under the requirements of the IM of the statement of cash flows. While, the higher standard deviation of CFO than that of $EARN$ may suggest that CFO is more volatile than $EARN$, consistent with Dechow *et al*. (1998), Al-Attar and Hussain (2004), Kim and Kross (2005). This provides initial evidence that accrual process mitigates a substantial portion of the CFO fluctuations that results from the matching and timing problems inherent in the CFO. Indeed, this cash flow volatility, which is to some extent smoothed by the accruals procedure, is a reason why $EARN$ could provide a more reliable indicator of future performance and cash generating ability (Al-Attar and Hussain, 2004).

The descriptive statistics of the six DM components of the statement of cash flows reveal that the mean, median and standard deviation of $CSHRD$ and $CSHPD$ are higher than the other four DM components ($CSHTAX$, $CSHINTIN$,$CSHINTPD$ and $CSHOTHERS$) for both the GCC and non-GCC country firms, consistent with Krishnan and Largay (2000), Arthur *et al*. (2010), Farshadfar and Monem (2013b). Consequently, Farshadfar and Monem suggest that the predictive ability of the CFO would be considerably affected more by $CSHRD$ and $CSHPD$. Finally, one limitation of this thesis is that less than half of the sample firms report $CSHTAX$, $CSHINTIN$ and $CSHINTPD$ which justifies why the medians of these variables are zero.

These zero medians of the $CSHTAX$, $CSHINTIN$ and $CSHINTPD$ can be attributed to the following reasons. First, the adoption of Islamic banking and finance in the GCC countries since 1975 in response to growing investor demand for Shariah-compliant products (Wilson, 2009). Under the Islamic finance, interest received or paid is forbidden which justifies why $CSHINTIN$ and $CSHINTPD$ have zero medians. Furthermore, the non-GCC countries are currently witnessing growth in the Islamic banking sector (Farooq and Alahkam, 2016), which provides further justification for the observation that less than half of the sample reports $CSHINTIN$ and $CSHINTPD$. Second, although the tax laws in the non-GCC countries impose corporate taxes on all types of business activities either resident or non-resident corporations (PricewaterhouseCoopers, 2020), the tax laws in the GCC countries impose minimal or zero taxes (Harrison, 2010; Gooi, 2019; PricewaterhouseCoopers, 2020). Thus, since the number of GCC country firms in the sample employed in this thesis is larger, this justifies the zero median of the $CSHTAX$.

In conclusion, although there are significant differences between most of the variables of the cash flow prediction models in the GCC and non-GCC country firms, the variables still retain similar characteristics with respect to the sign and volatility in both regions which is also consistent with prior studies conducted in developed countries (e.g., Dechow *et al*., 1998; Krishnan and Largay, 2000; Barth *et al*., 2001; Arthur *et al*., 2010; Farshadfar and Monem, 2013b).

5.3 Correlation Analysis

The aim of this section is to present the correlation analysis between the variables employed in this thesis. Collis and Hussey (2013) argue that examining the possible association between variables is an essential step before running regression analysis for the following reasons. First, if there is no correlation between each dependent and independent variable, then regression analysis should not be conducted. Second, high correlation between independent variables may imply the presence of multicollinearity problem. In this thesis, the correlation between variables is measured using Pearson's correlation coefficient. A Pearson Correlation Matrix is presented in Table 5.2 to analyse the correlation between variables of the cash flow prediction models.

Table 5.2: Pearson Correlation Matrix for the Variables of the Cash Flow Prediction Models

Variables	CFO	$EARN$	ACC	$\Delta A/R$	ΔINV	$\Delta A/P$	DEP	$ACCOTHERS$	$CSHRD$	$CSHPD$	$CSHTAX$	$CSHINTIN$	$CSHINTPD$
$EARN$	0.635***												
ACC	-0.543***	0.304***											
$\Delta A/R$	-0.172***	0.185***	0.412***										
ΔINV	-0.159***	0.179***	0.390***	0.126***									
$\Delta A/P$	0.060***	0.002	-0.072***	0.260***	0.207***								
DEP	0.333***	0.069***	-0.336***	0.025**	0.019	0.009							
$ACCOTHERS$	-0.229***	0.108***	0.399***	-0.312***	-0.189***	0.186***	-0.054***						
$CSHRD$	0.247***	0.279***	-0.001	0.044***	0.124***	0.053***	0.195***	-0.018					
$CSHPD$	0.137***	0.192***	0.040***	0.066***	0.117***	0.043***	0.131***	-0.013	0.968***				
$CSHTAX$	0.162***	0.179***	-0.004	-0.006	-0.021	-0.006	0.068***	0.037*	0.111***	0.067***			
$CSHINTIN$	0.122***	0.131***	-0.008	-0.016	-0.022	-0.011	0.029**	0.024	-0.004	-0.028**	0.294***		
$CSHINTPD$	-0.069***	-0.095***	-0.018	0.008	-0.008	0.005	0.021	-0.012	-0.059***	-0.058***	0.093***	0.106***	
$CSHOTHERS$	0.383***	0.160***	-0.298***	-0.066***	-0.177***	0.004	0.006	-0.176***	-0.030***	0.135***	0.005	0.010	0.016

This table presents the Pearson Correlation Matrix for the variables of the cash flow prediction models for firms in the MENA region. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Variables definitions: CFO is net cash flows from operating activities as reported in the statement of cash flows. $EARN$ is net (after tax) earnings before extraordinary items and discontinued operations. ACC is difference between $EARN$ and CFO. $\Delta A/R$ is the change in accounts receivable during a year. ΔINV is the change in inventory during a year. $\Delta A/P$ is the change in accounts payable during a year. DEP is depreciation and amortization. $ACCOTHERS$ is other accruals calculated as follows $EARN - (CFO + \Delta A/R + \Delta INV - \Delta A/P - DEP)$. $CSHRD$ is estimated cash received from customers and calculated as follows $CSHRD = SALES - \Delta A/R$. $CSHPD$ is estimated cash paid to suppliers and employees and calculated as follows $CSHPD = COGS - DEP + Selling\ and\ Admin\ Expenses + \Delta INV - \Delta A/P + \Delta other\ CA - \Delta other\ CL$. $CSHTAX$ is disclosed cash related to tax payments. $CSHINTIN$ is disclosed cash related to interest income. $CSHINTPD$ is disclosed cash related to interest payments. $CSHOTHERS$ is other operating cash flows calculated as $CFO - (CSHRD - CSHPD - CSHTAX + CSHINTIN - CSHINTPD)$. All the variables are scaled by average total assets. The sample spans 14 years from 2005 to 2018. All variables are trimmed at the 1 percent and 99 percent levels. The MENA region countries include Bahrain, Egypt, Kuwait, Jordan, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates.

Table 5.2 reveals that CFO has strongly significant correlation with all the other variables at the 1% level. Consistent with Barth *et al*. (2001), Kim and Kross (2005) and Ebaid (2011), $EARN$ is significantly positively correlated with CFO and ACC, while CFO and ACC are significantly negatively correlated.

Each accrual component is individually significantly correlated with the CFO. The CFO has negative correlation with annual changes in A/R, INV and $ACCOTHERS$, while positive correlation with annual change in A/P along with DEP, consistent with Barth *et al*. (2001) and Ebaid (2011). Short-term accruals are significantly correlated with each other, while long-tem accruals are significantly correlated with only one variable of the short-term accruals which is change in A/R. However, although the correlation coefficients between accrual components are mostly significant, they are lower than 0.50. Thus, this suggests initially that there is no multicollinearity problem among accrual components.

The CFO is significantly positively correlated with all the DM components of the statement of cash flows ($CSHRD, CSHPD$, $CSHINTIN$, $CSHTAX$ and $CSHOTHERS$), except $CSHINTPD$ which is significantly negatively correlated with the CFO at the 1% level. In testing the persistence of the DM components, consistent with Cheng and Hollie (2008), untabulated results of the Pearson correlation coefficients show that the persistence of $CSHRD$ and $CSHPD$ exceeds that of all the other DM components[3]. Since the persistence captures the extent to which a firm's cash flows will recur in future periods, thus, $CSHRD$

[3] Dechow *et al.* (1998) argue that the assumption of autocorrelation is not critical to most of the results of cash flow prediction models. Dechow *et al.* find that sales changes for most of their sample firms are consistent with a random walk. Furthermore, Finger (1994) finds that random walk provides a better description of earnings in their sample firms.

and $CSHPD$ are expected to be superior predictors of the one-year-ahead CFO compared to other components due to their higher persistence.

The correlation coefficients between most of the DM components are significant, but they are lower than 0.50, except the correlation coefficient between $CSHRD$ and $CSHPD$ which is 0.968. This strong correlation between these two variables is expected given that a firm's ability to pay its employees and suppliers depends on its cash collection from customers (Farshadfar and Monem, 2013b). Thus, when a correlation coefficient between independent variables is more than 0.80, this might cause some multicollinearity problems in the regression (Gujarati, 2004).Multicollinearity may bias the t-statistics downward which may affect the reliability of the results (Cheng and Hollie, 2008).

However, the simple bivariate correlations in Table 5.2 are presented here for information, while these data are not used to assess the potential problem of multicollinearity. An advanced method is used to assess the multicollinearity problem which is the variance inflation factor (henceforth, VIF). A high VIF indicates a high level of multicollinearity, with a VIF more than the cut-off point of 10 indicating a need for further investigation (Gujarati, 2004). However, if the aim of the analyses is prediction, multicollinearity may be given less weight, and the highest adjusted R-squared statistic may be interpreted directly as indicating the best prediction (Gujarati, 2004).

Correlation analysis doesn't show any causal relationship between the variables. So in order to analyse the relationship between the CFO_{t+1} and the predictors (i.e. $EARN_t$, CFO_t and ACC_t) regression analysis is used. Regression is a more powerful method when compared with correlation because it doesn't only show the direction and strength of a relationship, but determines the causal effect of this relationship. Moreover, bivariate correlation coefficients cannot provide a reliable indicator of association in a manner which controls for additional explanatory variables (Al-Attar and Hussain, 2004).

Therefore, in order to test the hypotheses related to prediction models, two main methods are used which are in-sample regression analysis and out-of-sample predictions tests. In conclusion, there is a strong significant correlation between CFO and all the predictors at the 1% level in the MENA region firms. Therefore, these variables can be useful predictors of the one-year-ahead CFO in the regression models.

5.4 In-Sample Regression Analysis

As a link to previous in-sample research and a point of departure, this thesis replicates and updates the studies of Barth *et al*. (2001), Al-Attar and Hussain (2004), Cheng and Hollie (2008) on recent data from the MENA region firms. The in-sample regression examines the following six regression models to compare their ability to predict the one-year-ahead CFO. The six prediction models are estimated of regressing the one-year-ahead CFO on: (i) current aggregate $EARN$ (Model 1); (ii) current CFO (Model 2); (iii) current CFO and total ACC (Model 3); (iv) current CFO and ACC components (Model 4); (v) current disaggregated CFO into the DM components of the statement of cash flows (Model 5); and (vi) current disaggregated CFO into the DM components with ACC components (Model 6).

The data set employed in this chapter is panel data as it is pooled across years and firms. However, since not all the MENA region firms provide data for all the years between 2005 and 2018, the data set is considered as an unbalanced panel. For comparison purposes and consistent with the previous studies, the results are derived from appropriate multivariate models estimated using the PRM, and later the FEM or the REM. Then, a comparison between the predictive abilities of the six regression models are based on the AIC, BIC and bootstrapping. Finally, the VIF is reported to identify potential problems of multicolinearity. To mitigate possible problems associated with heteroskedasticity and autocorrelation, the reported t-statistics in this thesis are calculated using standard errors corrected for heteroskedasticity and autocorrelation (White, 1980) to provide more accurate inferences compared to t-statistics estimated in the usual way.

5.4.1 In-Sample Regression: Pooled Regression Model Analysis

This section employs the PRM to estimate and analyse the six prediction models used in this chapter. The use of the PRM provides a useful avenue to compare between the results of this thesis and that of Barth *et al.* (2001) who use the same methodology. Inconsistent with Barth *et al*., this thesis does not use the Vuong (1989) z-statistic to assess the significance of one PRM's superiority over another as mentioned in Chapter 4. Instead, bootstrapping is conducted in this thesis to do this task, thus bootstrapping is computed to assess the statistical significance of any increase in the adjusted R-squared statistic of a model over another. In this thesis, the number of bootstrap replications is 1000 and the p-values are estimated from the empirical distribution of the bootstrapped z-values. Moreover, the AIC and BIC metrics are also employed in this thesis, consistent with Al-Attar and Hussain (2004). The model with the lowest values of AIC and BIC is preferred.

Table 5.3 presents the regression results of the PRM for the six prediction models. Furthermore, the table also shows the F-statistics, AIC, BIC and VIF values for the MENA region firms. The results show that all the models have F-statistics that are significant at the 1% level which mean that all the models play an important role in predicting the one-year-ahead CFO. However, by analysing the results in more depth, it is apparent that although the results of the first two models show that $EARN_t$ and CFO_t are significant predictors of CFO_{t+1}, the adjusted R-squared statistics of these models are the lowest compared to the other models. Furthermore, compared to Barth *et al.* (2001), the coefficient magnitudes and the adjusted R-squared statistics of these two models are higher than that reported in Barth *et al.* (2001).

By comparing the first two models, the results of Table 5.3 show that current $EARN$ has a superior predictive ability of the one-year-ahead CFO compared to the current CFO due to the following reasons. First, the adjusted R-squared statistic of the $EARN$ prediction model is slightly higher than that of the CFO prediction model. Second, the AIC and BIC values of $EARN$ prediction model are slightly lower than that of the CFO prediction model supporting the superiority of the former model. However, by using bootstrapping technique to determine whether the difference between the adjusted R-squared statistics of both models is statistically significant, the results of Table 5.4 show that difference between the adjusted R-squared statistics of both models is insignificant, meaning that there is no difference between the explanatory powers of these two models. Therefore, it is not clear which from current $EARN$ or current CFO is superior in predicting the one-year-ahead CFO in the MENA region firms.

Table 5.3: Cash Flow Prediction Models: Pooled Regression Model Analysis of the MENA Region Firms

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Adjusted R-squared	0.30		0.28		0.36		0.40		0.31		0.41	
F-statistics	1355.05***		1149.96***		965.36***		418.79***		255.20***		243.87***	
AIC	-10606.9		-10482.7		-10989.5		-11286.4		-10655.3		-11334.7	
BIC	-10594		-10469.8		-10970.2		-11241.4		-10610.4		-11257.6	
Maximum VIF	1.00		1.00		1.42		1.54		29.66		41.66	
Mean VIF	1.00		1.00		1.42		1.36		10.69		8.73	
Predictors [expected sign of coefficient]	Coeff.	Robust t-statistics	Coeff.	Robust t-statistics	Coeff.	Robust t-statistics	Coeff.	Robust t-statistics	Coeff.	Robust t-statistics	Coeff.	Robust t-statistics
$EARN_t$ [+]	0.629***	36.81										
CFO_t [+]			0.536***	33.91	0.715***	43.7	0.671***	40.85				
ACC_t [+/-]					0.406***	17.6						
$\Delta A/R_t$[+]							0.485***	15.81			0.471***	15.26
ΔINV_t[+]							0.480***	12.86			0.439***	11.82
$\Delta A/P_t$[-]							-0.600***	-14.86			-0.583***	-14.63
DEP_t[+]							0.334***	6.84			0.284***	5.79
$ACCOTHERS_t$[+/-]							0.408***	13.87			0.380***	12.90
$CSHRD_t$[+]									0.577***	34.78	0.697***	40.21
$CSHPD_t$ [-]									-0.558***	-31.99	-0.691***	-38.46
$CSHTAX_t$[-]									-0.283	-1.39	-0.737***	-3.91
$CSHINTIN_t$ [+]									2.116***	3.71	1.661***	3.18
$CSHINTPD_t$ [-]									-0.557***	-3.33	-0.550***	-3.37
$CSHOTHERS_t$ [+/-]									0.444***	23.99	0.617***	32.23
Constant	0.044***	32.22	0.033***	19.64	0.031***	19.66	0.009***	4.41	0.018***	8.37	0.004**	1.82
Number of Observations	**4,556**											

This table presents regression summary statistics of estimation, using the PRM for the following six prediction models for the MENA region firms:

Model 1 : $CFO_{it+1} = \beta_0 + \beta_1 EARN_{it} + \varepsilon_{it+1}$

Model 2: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it+1}$

Model 3: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 ACC_{it} + \varepsilon_{it+1}$

Model 4: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 \Delta A/R_{it} + \beta_3 \Delta INV_{it} + \beta_4 \Delta A/P_{it} + \beta_5 DEP_{it} + \beta_6 ACCOTHERS_{it} + \varepsilon_{it+1}$

Model 5: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4 CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \varepsilon_{it+1}$

Model 6: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4 CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \beta_7 \Delta A/R_{it} + \beta_8 \Delta INV_{it} + \beta_9 \Delta A/P_{it} + \beta_{10} DEP_{it} + \beta_{11} ACCOTHERS_{it} + \varepsilon_{it+1}$

T-statistics for all slopes calculated using White (1980) robust standard errors. VIF is an indicator for multicollinearity where values exceed 10. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Variables definitions: CFO is net cash flows from operating activities as reported in the statement of cash flows. $EARN$ is net (after tax) earnings before extraordinary items and discontinued operations. ACC is difference between $EARN$ and CFO. $\Delta A/R$ is the change in accounts receivable during a year. ΔINV is the change in inventory during a year. $\Delta A/P$ is the change in accounts payable during a year. DEP is depreciation and amortization. $ACCOTHERS$ is other accruals calculated as follows $EARN - (CFO + \Delta A/R + \Delta INV - \Delta A/P - DEP)$. $CSHRD$ is estimated cash received from customers and calculated as follows $CSHRD = SALES - \Delta A/R$. $CSHPD$ is estimated cash paid to suppliers and employees and calculated as follows $CSHPD = COGS - DEP + Selling\ and\ Admin\ Expenses + \Delta INV - \Delta A/P + \Delta other\ CA - \Delta other\ CL$. $CSHTAX$ is disclosed cash related to tax payments. $CSHINTIN$ is disclosed cash related to interest income. $CSHINTPD$ is disclosed cash related to interest payments. $CSHOTHERS$ is other operating cash flows calculated as $CFO - (CSHRD - CSHPD - CSHTAX + CSHINTIN - CSHINTPD)$. All the variables are scaled by average total assets. The sample spans 14 years from 2005 to 2018. All variables are trimmed at the 1 percent and 99 percent levels. The MENA region countries include Bahrain, Egypt, Kuwait, Jordan, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates.

The results of the previous studies concerning the performance of $EARN$ and CFO prediction models in the MENA or non-MENA region are inconclusive (Dechow *et al*., 1998; Farshadfar *et al*., 2008; Ebaid, 2011, Al-Debi'e, 2011). Specifically, Dechow *et al*. (1998) and Ebaid (2011) find that the ability of current $EARN$ to predict the $FCFO$ is higher than that of the current CFO, while Farshadfar *et al*. (2008) and Al-Debi'e (2011) provide evidence to the contrary showing that the current CFO has higher predictive power. Thus, these mixed results can be considered as partial explanation for the insignificant differences between both models that are observed in the results of Table 5.4. Specifically, since the MENA region includes firms from both the GCC and non-GCC countries which have different regulations and accounting standards, the separate regression for each region that is analysed in Section 5.4.3 may reveal some clearer reasons for these mixed results.

Table 5.4: Bootstrap the Difference of the Adjusted R-squared Statistics of the PRM for the MENA Region Firms

	Coefficient	z-value	p-value
Model 1 vs. Model 2	0.019	1.29	0.199
Model 3 vs. Model 1	0.056***	7.48	0.000
Model 3 vs. Model 2	0.075***	9.01	0.000
Model 4 vs. Model 1	0.097***	11.76	0.000
Model 4 vs. Model 3	0.041***	8.05	0.000
Model 5 vs. Model 2	0.027***	5.08	0.000
Model 6 vs. Model 1	0.104***	12.17	0.000
Model 6 vs. Model 2	0.123***	11.71	0.000
Model 6 vs. Model 3	0.048***	8.26	0.000
Model 6 vs. Model 4	0.007***	2.65	0.008
Model 6 vs. Model 5	0.096***	10.91	0.000

This table reports bootstrapping the difference of the adjusted R-squared statistics of the PRM for the MENA region firms. The table shows the difference between the adjusted R-squared statistic of a model versus another (coefficient) and the bootstrap z-values of this difference and p-values estimated from the empirical distribution of the bootstrapped z-values. The number of bootstrap replications is 1000. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

To provide further investigations of the predictive ability of current $EARN$ in predicting the one-year-ahead CFO, current $EARN$ is disaggregated into CFO and total ACC as in Model

3. The results in Table 5.3 show that disaggregating $EARN$ leads to an increase in the explanatory power of $EARN$ from 0.30 (Model 1) to 0.36 (Model 3), consistent with Barth *et al*. (2001), Al-Attar and Hussain (2004) and Farshadfar and Monem (2013b). These results are also supported by the AIC and BIC metrics that show that Model 3 has lower AIC and BIC values indicating its superior predictive ability compared to Model 1. Furthermore, by using bootstrap technique, the results of Table 5.4 show that difference between the adjusted R-squared statistics of both models is significant which supports the superiority of Model 3 and show that disaggregated components of $EARN$ have higher predictive ability than the aggregate figure.

Further, the adjusted R-squared statistic of Model 3 which includes both CFO and total ACC is higher than Model 2 (the CFO Model). Therefore, the addition of total ACC_t to CFO_t provides a superior ability to predict the CFO_{t+1} than the CFO_t alone. These results are supported by the reductions in the values of AIC and BIC in Model 3 compared to Model 2. Moreover, by using bootstrap technique, the results of Table 5.4 show that difference between the adjusted R-squared statistics of both models is significant which confirms that the explanatory power of Model 3 is significantly higher than the explanatory power of Model 2. Therefore, these results show that CFO_t alone has a limited ability to predict the CFO_{t+1} compared to the predictive ability of CFO_t and total ACC_t together which represent the components of $EARN_t$. Although $EARN_t$ and CFO_t have insignificant difference in predicting the CFO_{t+1}, disaggregating $EARN_t$ into its two main components (CFO_t and total ACC_t) in Model 3 significantly improve its predictive ability, compared to both aggregate $EARN_t$ (Model 1) and CFO_t (Model 2).

Therefore, ACC_t is not an unbiased predictor of CFO_{t+1} because accruals information adds incremental predictive power to Model 3 compared to Model 2. This means that the CFO Model might suffer from specification bias due to omitting a relevant variable which is ACC. As shown in Table 5.3, when adding total ACC_t in Model 3, the coefficient of CFO_t has increased from 0.536 (Model 2) to 0.715 (Model 3). Although Model 3 reveals that both CFO_t and ACC_t are positive and significant predictors of CFO_{t+1}, the coefficient of CFO_t (0.715) is greater than the coefficient of ACC_t (0.406). This suggests that the cash component of earnings plays a more important role in predicting the one-year-ahead CFO compared to the accrual component.

Therefore, the PRM results reveal that disaggregating current $EARN$ into CFO and total ACC results in a significant improvement in the ability of $EARN$ to predict the one-year-ahead CFO. Therefore, the purpose of Model 4 is to examine whether the addition of ACC components to current CFO improves more the predictive ability of $EARN$. The disaggregation of ACC into its main components ($\Delta A/R$, ΔINV, $\Delta A/P$, DEP and $ACCOTHERS$) should enhance the quality of prediction, since each individual ACC component has different information about the $FCFO$ resulting in different weight in prediction. In contrast, the total ACC implicitly place the same weight on each ACC component, masking information relevant to predicting the $FCFO$ (Barth *et al*., 2001).

Consistent with Barth *et al*. argument and findings, disaggregating ACC into its major components in Model 4 leads to further increase in the explanatory power of $EARN$. The adjusted R-squared statistic has increased from 0.30 (Model 1) and 0.36 (Model 3) to reach 0.40 (Model 4) when disaggregating ACC components, consistent with Barth *et al*. (2001), Al-Attar and Hussain (2004), Ebaid (2011), Farshadfar and Monem (2013b), The adjusted R-squared statistic of Model 4 is the highest among the previous models. Furthermore, by using bootstrap technique, the results of Table 5.4 show that difference between the R-squared statistics of Models 4 and 1 and Models 4 and 3 are significant which supports the superiority of Model 4 over Models 1 and 3. These results indicate that disaggregating ACC into its components as suggested by Barth *et al*. (2001) leads to significant improvement in the predictive ability of $EARN$.

Table 5.3 reveals that, consistent with Barth *et al*., all the ACC components have significant positive relationship with CFO_{t+1}, except $\Delta A/P_t$ which has a significant negative relationship with CFO_{t+1}. These results imply that accruals reflect information about expected future cash inflows. Specifically, when managers purchase inventory or fixed assets, they expect to generate cash inflows from these purchasing activities. Furthermore, collecting accounts receivables and paying accounts payable result in cash inflows and cash outflows, respectively. The coefficient on $\Delta A/P_t$ (-0.600) is the largest while the coefficient of DEP_t (0.334) is smallest among the accrual components, excluding $ACCOTHERS_t$. Although, the coefficient of DEP_t is the smallest, it cannot be ignored as one of the predictors of the CFO_{t+1}. This indicates that not only the short-term accruals that have an important role in predicting the one-year-ahead CFO but also long-term accruals. The significance of DEP coefficient is in line with the argument and findings of Barth *et al*. (2001) that long-term accruals can predict the $FCFO$, but inconsistent with assertions of Dechow *et al*. (1998) that only working capital accruals are the predictors of the $FCFO$. Thus, this finding suggests that the prediction models that focus on working capital accruals only understate the predictive abilities of $EARN$ and ACC.

Therefore, this provides direct evidence that the disaggregation of $EARN$ data into CFO and total ACC or CFO and ACC components helps explain future cash flow data better than aggregate $EARN$. Although these results are consistent to those obtained by Barth *et al*. (2001), Al-Attar and Hussain (2004), the other prior evidence (e.g., Lev *et al*. 2010; Lorek and Willinger, 2010; Nam *et al*., 2012) on the usefulness of $EARN$ components is mixed. This might be due to differences in methodologies such as in-sample regression analysis and out-of-sample prediction tests. Therefore, this thesis conducts both in-sample regression analysis and out-of-sample predictions tests to reach a solid conclusion regarding whether or not disaggregating $EARN$ is useful when predicting the one-year-ahead CFO.

Krishnan and Largay (2000) and Cheng and Hollie (2008) argue that since disaggregating ACC components enhances the predictive abilities of $EARN$ and ACC, then, disaggregating the CFO into the DM components of the statement of cash flows may further improve the predictive ability of the CFO. The results of Table 5.3 support this argument by showing that Model 5 (the disaggregated CFO Model) has a higher adjusted R-squared statistic compared to Model 2 (the aggregate CFO Model). In addition, the results of bootstrapping in Table 5.4 show that the difference between the adjusted R-squared statistics of these two models is statistically significant. These results are consistent with Orpurt and Zang (2009) who report an increase in the explanatory power when disaggregating the CFO into the DM components. Furthermore, Model 5 has lower AIC and BIC values which provides further support for the superiority of Model 5. These results provide evidence that a disaggregation of current CFO into the DM components contributes to a significantly higher explanatory power relative to current aggregate CFO when predicting the one-year-ahead CFO.

Model 5 reports that all the DM components individually contribute significantly in predicting the CFO_{t+1}, except $CSHTAX_t$. The coefficient of $CSHRD_t$ and $CSHINTIN_t$ are positive and those of $CSHPD_t$ and $CSHINTPD_t$ are negative, which is expected as the former are cash inflow variables and the latter are cash outflow variables. However, inconsistent with the discussion in Section 5.3, although $CSHRD_t$ and $CSHPD_t$ have higher persistence compared to the other DM components which implies that they should have higher predictive ability, the results of Model 5 show that the coefficient of $CSHINTIN_t$ is greater than that of $CSHRD_t$ and $CSHPD_t$. However, by analysing the confidence intervals of the coefficients of these variables and their standard errors, it is apparent that $CSHINTIN_t$ has lower t-statistic and a wider confidence interval compared to $CSHRD_t$ and $CSHPD_t$. This, in turns, casts some doubts on the stability of this variable as a predictor of the CFO_{t+1} and supports the argument in Section 5.3 that the $CSHRD_t$ and $CSHPD_t$ are more important predictors of the CFO_{t+1}.

These results are consistent with the argument of Cheng and Hollie (2008) that $CSHRD$ and $CSHPD$ are more closely related to a firm's income producing and core operating activities than $CSHINTIN$, $CSHINPD$ and $CSHTAX$. Therefore, $CSHRD$ and $CSHPD$ are the most important and significant variables in predicting the one-year-ahead CFO, while the other cash flow component variables which are $CSHTAX$, $CSHINTIN$ and $CSHINTPD$ are comparably less important.

This might be attributable to two reasons. First, the tax-free policies in the GCC countries and the structure of the Islamic banking and finance that has evolved in the MENA region in recent years as discussed in the descriptive statistics in Section 5.2. According to Islamic finance, a firm should ideally have no interest-bearing securities (Farooq and Alahkam, 2016). Thus, the amount of interest-bearing securities is very low in Shariah-compliant firms in the MENA region countries. Thus, this leads to the avoidance of receiving or paying interest in these countries which justifies why $CSHINTIN$ and $CSHINTPD$ have less or no predictive ability compared to $CSHRD$ and $CSHPD$.

Second, the ongoing argument that these components are a mix of operating and non-operating cash outflows (Cheng and Hollie, 2008). Specifically, the US GAAP requires firms to classify interest received, interest paid, and taxes paid as an operating activity in the statement of cash flows. In contrast, the IFRS, as stated in IAS 7, give managers the flexibility to classify these items into operating, investing, or financing activities within the statement of cash flows. Given the argument in Section 5.2 that some of the countries in the MENA region are conforming with the IFRS while others are conforming to their local GAAP, and the above differences between the IFRS and the GAAP concerning their treatments of the interest received, interest paid, and taxes paid, it is difficult to identify the classification of these components in the statement of cash flows. This, in turn, may justify the results that $CSHTAX$, $CSHINTIN$ and $CSHINPD$ have less impact in predicting the one-year-ahead CFO compared to $CSHRD$ and $CSHPD$.

The PRM results of the full disaggregation model (Model 6) show that all the components of CFO and ACC are significant at the 1% level. The coefficients of the DM components have the same signs as Model 5 and the coefficients of ACC components have the same sign as Model 4. The coefficients of all the DM components get larger except $CSHINTIN$ and $CSHINTPD$ after controlling for ACC components. Comparing the coefficients for the ACC components between Model 4 and 6 reveals that the magnitudes of the coefficients of these components decrease. This confirms that the CFO and its components play a more important role in predicting the one-year-ahead CFO compared to the ACC components.

Moreover, the adjusted R-squared statistic of Model 3 which contains both aggregate CFO and ACC has increased from 0.36 to 0.41 in Model 6 when the components of CFO and ACC are disaggregated, consistent with Cheng and Hollie (2008). Bootstrapping shows that the difference in the adjusted R-squared statistics of these two models is significant. This means that disaggregating the components of both CFO and ACC adds significantly when predicting the one-year-ahead CFO. Moreover, Model 6 exhibits the highest adjusted R-squared statistic and the lowest AIC and BIC values. Bootstrapping shows that the adjusted R-squared statistic of Model 6 is significantly higher than that of all the other models, confirming the superiority of this model among the other prediction models.

According to the PRM analysis, Model 6 is considered the best model to predict the one-year-ahead CFO for the MENA region listed companies. Therefore, this result indicates a strong association between CFO_{t+1} and the components of CFO_t and ACC_t, increasing prospects about a strong out-of-sample prediction performance as well. Therefore, the PRM analysis accepts all the hypotheses that suggest that disaggregating $EARN$, CFO and ACC into their components enhance their predictive abilities. However, the PRM rejects the hypothesis that suggests the superiority of the CFO prediction model over the $EARN$ prediction model. This is explained in details in Sections 5.4.3 and 5.5.

However, the findings of the last two models should be treated cautiously given the high multicolinearity, as the maximum VIF is greater than 10. Models 5 and 6 have two highly collinear variables which are $CSHRD$ and $CSHPD$. Maddala (2001) argues that if the main purpose of regression analysis is prediction, then multicollinearity is considered a serious problem only if the predictions of the full model are worse than those from a model that includes only a subset of the explanatory variables. Thus, a simple way to test for the severity of multicollinearity is to drop one of the collinear variables and retest the predictive ability of the new model. Consequently, Model 5 Model 6 are re-analysed after dropping $CSHPD$ similar to Krishnan and Largay (2000) and Farshadfar and Monem (2013a). The adjusted R-squared statistics of the Modified Models 5 and 6 fall to reach 0.07 and 0.15, respectively (untabulated) after dropping $CSHPD$. Following Maddala (2001), multicollinearity is not a serious problem in Models 5 and 6.

Another way to deal with multicollinearity in Models 5 and 6 is through combining $CSHRD$ and $CSHPD$ (Gujarati, 2004). Since the absolute values of their coefficients are almost identical, then $CSHRD$ and $CSHPD$ are combined into a single variable, consistent with Krishnan and Largay (2000) and Farshadfar and Monem (2013a). Using this approach leads to the disappearance of the multicollinearity problem in the modified models and the (untabulated) adjusted R-squared statistics (0.31 and 0.41, respectively) of these models are almost similar to the full models. Furthermore, the coefficients of the combined variables are very similar to those from the uncombined variables and the remaining variables are still significant in both modified models. Since the high correlation between $CSHRD$ and $CSHPD$ does not appear to pose a serious problem, thus, it is normal to keep the two variables separate.

In conclusion, the results of the PRM analysis provide evidence on the important roles of the $EARN$, CFO and ACC components in predicting one-year-ahead CFO for the MENA region firms. The results indicate that there are significant predictive gains when disaggregating the components of $EARN$, CFO and ACC. The results also indicate that cash flow data alone is insufficient in predicting the one-year-ahead CFO, but it should be used in conjunction with ACC data. However, it is not obvious which is superior in predicting the one-year-ahead CFO from the two aggregate predictors either $EARN$ or CFO in the MENA region firms. In the following section, this thesis extends the Barth *et al*. (2001) analysis to take into account the firm-specific differences when predicting the one-year-ahead CFO.

5.4.2 In-Sample Regression: Fixed Effect Model Analysis

This section further re-investigates the PRM analysis conducted in the previous section, by examining the six prediction models using one of the panel data regressions either the FEM or the REM. This may minimise the potential problem of the PRM that assumes that the intercepts are constant across all the firms (Gujarati, 2004). In the context of the prediction of the $FCFO$, Al-Attar and Hussain (2004) employ the FEM and compare it with the PRM estimation of their research prediction models. They report that using the FEM results in an increase in the adjusted R-squared statistics of their models. Therefore, the main aim of this re-estimation is to assess the robustness of the original PRM parameter estimates. Although the magnitude of coefficients may change as the assumptions of either the FEM or the REM differs from that of the PRM, it is expected that the signs and significance levels to remain unchanged.

The Hausman's (1978) specification test is used to evaluate whether the FEM or the REM is appropriate. The results of the Hausman test indicate that there are variations in the intercepts and the firm specific effects are correlated with the independent variables.

Therefore, the null hypothesis of no correlation is rejected at the 1% level for all the six models supporting the use of the FEM over the REM (Brooks, 2014). Accordingly, the FEM is chosen for estimating the six models where the intercept term is allowed to vary across firms. A consequence of using the FEM is that by controlling the firm differences, a large portion of the variations in the one-year-ahead CFO is eliminated which remained unexplained within the PRM analysis (Al-Attar and Hussain, 2004).

Table 5.5 presents the regression results of the six prediction models, using the FEM. The table also shows the results of Hausman's test, F-tests, AIC and BIC. All the models are significant at the 1% level. It is clear from the adjusted R-squared statistics that the use of a firm specific intercept improves the explanatory power of the research prediction models in comparison to the same models estimated using the PRM, consistent with Al-Attar and Hussain (2004). For example, the $EARN_t$ and CFO_t explain 0.30 and 0.28 of the variations in the CFO_{t+1}under the PRM, respectively, but under the FEM, the model's explanatory power increases to 0.47 and 0.44, respectively.

By comparing the first two models, the FEM analysis shows that the model containing only $EARN_t$ has superior explanatory power than a model containing only CFO_t, consistent to the PRM results. The AIC and BIC metrics show reductions supporting the increase in the explanatory power of $EARN$ model in a comparison to the CFO model. In contrast to the PRM, by using bootstrapping technique to determine whether the difference between the adjusted R-squared statistics of both models is statistically significant, the results of Table 5.6 confirms that the explanatory power of the $EARN$ model is significantly higher than the explanatory power of the CFO model. Therefore, according to the FEM, it is obvious that current $EARN$ has a superior predictive ability of the one-year-ahead CFO compared to the current CFO in the MENA region firms.

These results show some inconsistencies between the results of the PRM and the FEM, therefore, it cannot be concluded which is superior from current $EARN$ and CFO in predicting the one-year-ahead CFO in the firms of the MENA region. Despite the inconsistency of the results of the PRM and the FEM, both reject Hypothesis 3 which suggests that the CFO prediction model is superior compared to the $EARN$ prediction model in predicting the one-year-ahead CFO.

Moreover, inconsistent with the PRM results, the FEM find that disaggregating $EARN$ into CFO and total ACC (Model 3) does not lead to further improvement in the explanatory power compared to $EARN$ prediction model (Model 1). The AIC and BIC values of Model 3 and Model 1 are almost the same and the results of bootstrapping statistic find that the difference between the adjusted R-squared statistics of both models is insignificant. However, both the PRM and the FEM emphasis that disaggregating ACC into its major components in Model 4 leads to further significant improvement in the explanatory power compared to Model 1 and 3, consistent with Barth *et al*. (2001) and Al-Attar and Hussain (2004), and this is also supported by the AIC, BIC values and the results of bootstrapping statistic.

Table 5.5: Cash Flow Prediction Models: Fixed Regression Model Analysis of the MENA Region Firms

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Adjusted R-squared	0.47		0.44		0.47		0.48		0.46		0.49	
Hausman Test	299***		1845***		1595***		1186***		180***		1339***	
F-statistics	100.57***		6.74***		50.30***		22.99***		14.54***		18.51***	
AIC	-12570.59		-12373.70		-12570.92		-12620.30		-12515.16		-12702.67	
BIC	-12557.74		--12360.85		-12555.64		-12575.33		-12470.19		-12625.58	
Predictors [expected sign of coefficient]	**Coeff.**	**Robust t-statistics**	**Coeff.**	**Robust t-statistics**	**Coeff.**	**Robust t-statistics**	**Coeff.**	**Robust t-statistics**	**Coeff.**	**Robust t-statistics**	**Coeff.**	**Robust t-statistics**
$\boldsymbol{EARN_t}$ [+]	0.276***	10.03										
$\boldsymbol{CFO_t}$ [+]			0.059***	2.60	0.262***	8.73	0.266***	8.92				
$\boldsymbol{ACC_t}$ [+/-]					0.287***	9.60						
$\boldsymbol{\Delta A/R_t}$[+]							0.341***	9.43			0.327***	9.02
$\boldsymbol{\Delta INV_t}$[+]							0.294***	7.07			0.221***	5.24
$\boldsymbol{\Delta A/P_t}$[-]							-0.373***	-8.83			-0.330***	-7.59
$\boldsymbol{DEP_t}$[+]							0.288**	2.32			0.187	1.49
$\boldsymbol{ACCOTHERS_t}$[+/-]							0.260***	7.64			0.220***	6.29
$\boldsymbol{CSHRD_t}$[+]									0.113***	4.80	0.293***	9.73
$\boldsymbol{CSHPD_t}$ [-]									-0.108*	-3.01	-0.242***	-7.25
$\boldsymbol{CSHTAX_t}$[-]									-1.043***	-2.18	-1.220***	-4.41
$\boldsymbol{CSHINTIN_t}$ [+]									0.965	1.03	0.626	0.69
$\boldsymbol{CSHINTPD_t}$ [-]									0.041	0.18	0.041	0.18
$\boldsymbol{CSHOTHERS_t}$ [+/-]									-0.001	-0.02	0.193***	5.87
Constant	0.061***	37.26	0.070***	33.74	0.063***	29.49	0.042***	9.08	0.029***	4.76	0.018***	2.79
Number of Observations	**4,556**											

This table presents regression summary statistics of the re-estimations of the following six prediction models, using the FEM for the MENA region firms, where FE variable is firm:

Model 1: $CFO_{it+1} = \beta_0 + \beta_1 EARN_{it} + \varepsilon_{it+1}$

Model 2: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it+1}$

Model 3: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 ACC_{it} + \varepsilon_{it+1}$

Model 4: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 \Delta A/R_{it} + \beta_3 \Delta INV_{it} + \beta_4 \Delta A/P_{it} + \beta_5 DEP_{it} + \beta_6 ACCOTHERS_{it} + \varepsilon_{it+1}$

Model 5: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4\, CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \varepsilon_{it+1}$

Model 6: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4\, CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \beta_7 \Delta A/R_{it} + \beta_8 \Delta INV_{it} + \beta_9 \Delta A/P_{it} + \beta_{10} DEP_{it} + \beta_{11} ACCOTHERS_{it} + \varepsilon_{it+1}$

T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Variables definitions: CFO is net cash flows from operating activities as reported in the statement of cash flows. $EARN$ is net (after tax) earnings before extraordinary items and discontinued operations. ACC is difference between $EARN$ and CFO. $\Delta A/R$ is the change in accounts receivable during a year. ΔINV is the change in inventory during a year. $\Delta A/P$ is the change in accounts payable during a year. DEP is depreciation and amortization. $ACCOTHERS$ is other accruals calculated as follows $EARN - (CFO + \Delta A/R + \Delta INV - \Delta A/P - DEP)$. $CSHRD$ is estimated cash received from customers and calculated as follows $CSHRD = SALES - \Delta A/R$. $CSHPD$ is estimated cash paid to suppliers and employees and calculated as follows $CSHPD = COGS - DEP + Selling\ and\ Admin\ Expenses + \Delta INV - \Delta A/P + \Delta other\ CA - \Delta other\ CL$. $CSHTAX$ is disclosed cash related to tax payments. $CSHINTIN$ is disclosed cash related to interest income. $CSHINTPD$ is disclosed cash related to interest payments. $CSHOTHERS$ is other operating cash flows calculated as $CFO - (CSHRD - CSHPD - CSHTAX + CSHINTIN - CSHINTPD)$. All the variables are scaled by average total assets. The sample spans 14 years from 2005 to 2018. All variables are trimmed at the 1 percent and 99 percent levels. The MENA region countries include Bahrain, Egypt, Kuwait, Jordan, Morocco, Oman, Qatar, Saudi Arabia, Tunisia and the United Arab Emirates.

Table 5.5 reveals that the signs of the coefficients and the significance level for the CFO and ACC components in Model 4 are the same as the PRM equivalents except for DEP which is significant at the 5% level. Overall, the results of the FEM supports Hypothesis 2.2 which argues for the importance of the disaggregation of ACC components when predicting the one-year-ahead CFO, while the results do not support Hypothesis 2.1 that suggests that disaggregating current $EARN$ into CFO and total ACC enhances the ability of $EARN$ to predict the one-year-ahead CFO in the MENA region company firms.

Table 5.6: Bootstrap the Difference of the Adjusted R-squared Statistics of the FEM for the MENA Region Firms

	Coefficient	z-value	p-value
Model 1 vs. Model 2	0.023	5.43***	0.000
Model 3 vs. Model 1	0.000	0.250	0.806
Model 3 vs. Model 2	0.024	5.30***	0.000
Model 4 vs. Model 1	0.006	2.88***	0.004
Model 4 vs. Model 3	0.006	2.92***	0.004
Model 5 vs. Model 2	0.017	4.62***	0.000
Model 6 vs. Model 1	0.016	4.54***	0.000
Model 6 vs. Model 2	0.044	7.25***	0.000
Model 6 vs. Model 3	0.016	4.60***	0.000
Model 6 vs. Model 4	0.010	3.68***	0.000
Model 6 vs. Model 5	0.023	5.35***	0.000

This table reports bootstrapping the difference of the adjusted R-squared statistics of the FEM for the MENA region firms. The table shows the difference between the adjusted R-squared statistic of a model versus another (coefficient) and the bootstrap z-values of this difference and p-values estimated from the empirical distribution of the bootstrapped z-values. The number of bootstrap replications is 1000. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Consistent with the PRM analysis, the values of the adjusted R-squared of Model 2 and Model 5 and the AIC and BIC values support that argument that the aggregate CFO (Model 2) does not explain as much as the DM components of the statement of cash flows (Model 5). Furthermore, the results of bootstrapping statistics indicate that the difference in the values of the adjusted R-squared of both models is significant at the 1% level which supports the superiority of Model 5 over Model 2 as shown in Table 5.6. Table 5.5 reveals that the significance level of the DM components in Model 5 is to a great extent different from their PRM equivalents. $CSHINTIN$, $CSHINTPD$, $CSHOTHERS$ become insignificant while $CSHTAX$ become significant. However, $CSHRD$ and $CSHPD$ are still significant. Consistent with the expectations, $CSHRD$ and $CSHPD$ are more closely related to operating activities, thus they have the greatest predictive power under the PRM and the FEM than the other DM components.

However, given the inconsistencies in the significance of $CSHTAX$, $CSHINTIN$, $CSHINPD$ between the PRM and the FEM, it is hard to assert that these variables are consistently useful in predicting the one-year-ahead CFO. These variables are found to be poor or not even predictors of the one-year-ahead CFO. Regardless of the insignificance of some of the DM components, still disaggregating the CFO into DM components enhance its predictive ability. This, in turn, provides some insights about the informational gains that result from the disaggregation of the DM components, with respect to predicting the one-year-ahead CFO, supporting Hypothesis 1.

To sum up, both the PRM and the FEM lead to the same conclusion that the full disaggregation model (Model 6) improves the ability of current $EARN$ to predict the one-year-ahead CFO. The results of the PRM and the FEM consistently support the notion that a model that includes the disaggregated CFO along with the disaggregated ACC components outperforms all the other models in predicting the one-year-ahead CFO. The adjusted R-squared statistics of Model 6 is significantly the highest and the AIC and BIC are the lowest in a comparison to the other prediction models as shown in Tables 5.5 and 5.6. Importantly, this conclusion with respect to the significance of the most of the DM cash flow components, after controlling for accruals information, provide insight for regulators to encourage disclosure of the components of the CFO using the DM. Consistent with the PRM analysis, the multicollinearity between $CSHRD$ and $CSHPD$, in Models 5 and 6, are not of a great concern.

Nevertheless, the results of Model 5 and Model 6 should be interpreted with caution because the DM components are estimated. The estimated DM components are subject to measurement error, for example, $CSHRD$ and $CSHPD$ are not reported by firms using the IM. These two components require knowledge of several variables, especially $CSHPD$, to estimate them in the MENA region firms where the statement of cash flows is prepared using the IM. Therefore, the potential measurement error in the estimated variables is high (Krishnan and Largay, 2000). Moreover, there is insufficient data available for $CSHTAX$, $CSHINTIN$ and $CSHINPD$ components. Unfortunately, these variables are not always disclosed by the MENA region firms due to the reasons mentioned in Section. 5.2.

In conclusion, given the contradiction in the results of the PRM and FEM, the results of this chapter cannot provide any conclusive evidence about whether the current $EARN$ or CFO is superior in predicting the one-year-ahead CFO in the MENA region firms. However, it is obvious that disaggregated models are superior compared to aggregate models under both the PRM and FEM. Nevertheless, the higher adjusted R-squared statistics of the disaggregation models may be attributable to the large number of explanatory variables in these models. It is worth mentioning that in-sample regression analysis which is frequently performed in accounting and finance research is not a crucial test of predictive performance. The in-sample regression analysis of this thesis is to a great extent consistent with the prior studies (e.g., Krishnan and Largay, 2000; Barth *et al*.,2001; Al-Attar and Hussain, 2004; Orpurt and Zang, 2009; Farshadfar and Monem, 2013b), and to a great extent as expected in the research hypotheses, so, whether or not the more realistic out-of-sample predictions of $EARN$, CFO, ACC and their disaggregated components differ from the in-sample regression analysis is an important empirical issue which is examined in Section 5.5.

5.4.3 In-Sample Regression: GCC and Non-GCC Country Firms

The conclusions that are predicated up to this point are based on the assumption that the information content and properties of $EARN$, CFO and ACC are similar across firms in the MENA region, which may not be the case. Therefore, additional tests are conducted to differentiate between the GCC and non-GCC countries. The results of the PRM and FEM for GCC and non-GCC country firms are to a great extent similar to the results of the MENA region firms reported in Sections (5.4.1 and 5.4.2). Therefore, the results of these tests are reported in Appendix A and for sake of brevity only the results that differ from the MENA region firms are reported and discussed. Inconsistent with the results of the MENA region as a whole, the PRM for the non-GCC countries show that, using bootstrapping, the difference between the values of the adjusted R-squared between the $EARN$ model and the CFO model is statistically significant.

The PRM results reveal that $EARN_t$ and CFO_t are positive and strongly significant predictors of the CFO_{t+1} for the GCC and non-GCC country firms. However, the explanatory power of the CFO model (adjusted R-squared = 0.36) is higher than the explanatory power of $EARN$ model (adjusted R-squared = 0.33) in the GCC country firms, as shown in Table A.1 in the Appendix. Although this is not the case in the non-GCC country firms where the $EARN$ model (adjusted R-squared = 0.24) shows higher explanatory power than the CFO model (adjusted R-squared= 0.16). Furthermore, the AIC and BIC values of the CFO and $EARN$ models confirm the superiority of these models in the GCC and non-GCC country firms, respectively. The bootstrapping results in Table A.2 in the Appendix show that there is a significant difference between the adjusted R-squared statistics of the $EARN$ model and the CFO model in the non-GCC country firms, while insignificant difference between both models in the GCC country firms. Thus, these results show that $EARN$ has superior predictive ability compared to CFO in the non-GCC country firms.

This variation in the results between the GCC and non-GCC countries can be attributed to the difference in financial reporting standards and requirements in these countries, which might create inconsistencies in the predictive abilities of $EARN$ and CFO. The accounting standards of the GCC countries become recently IFRS oriented, while the non-GCC countries are still domestic GAAP oriented. Consistent with the findings of the non-GCC country firms, Atwood, Drake, Myers and Myers (2011) find that current $EARN$ reported under the US GAAP are more closely associated with the one-year-ahead CFO than current $EARN$ reported under the IFRS. Taken together the results of both Atwood *et al*. (2011) and this thesis, it is expected that current $EARN$ is more informative about the one-year-ahead CFO for firms that follow the US GAAP or even the domestic GAAP than for firms that follow the IFRS.

Moreover, the IFRS is less restrictive than the US GAAP. The IFRS, as stated in IAS 7, allows cash flows received from interest to be classified as operating or investing in the statement of cash flows, and cash flows paid for interest can be classified as an operating or a financing activity. However, according to the US GAAP cash related to interest either paid or received is classified as an operating activity only, even if it is related to investing and financing activities. Furthermore, cash flows paid to taxes are always classified by the US GAAP as an operating activity, but under the IFRS a portion of taxes paid can be allocated to investing or financing activities. Therefore, the IFRS reporting requirements result in a more precise presentation of the cash flows from operating, investing, and financing activities than the US GAAP.

For example, the US GAAP requires income tax payments to be classified as an operating outflow in the statement of cash flows even though income tax payments sometimes are related to gains and losses of investing and financing activities, such as gains and losses on disposal of plant asset and early debt extinguishments. As a result, the income tax effects of investing and financing activities can contaminate the CFO, which may be not recurring in the future period, making the current CFO misleading when predicting the one-year-ahead CFO. Therefore, the misallocation of cash flows related to interest and taxes in the statement of cash flows may weaken the relationship between the current CFO and the one-year-ahead CFO, especially under the GAAP.

Therefore, the continuity of applying domestic accounting standards similar to the US GAAP might be a reason for the superior ability of the current $EARN$ over the current CFO in predicting the one-year-ahead CFO for the non-GCC country firms. However, the gradual adoption of the IFRS in the GCC country firms might be considered a cause for the higher explanatory power of the CFO model than the $EARN$ model. Although bootstrapping shows that the difference between these two models is insignificant, these results may be attributable to the fact that during the sample period not all the firms in the GCC countries adopted the IFRS. Thus, it is expected that when firms adhering to the IFRS in the GCC or the even non-GCC countries increase, the CFO model will significantly outperform the $EARN$ model in predicting the one-year-ahead CFO. Therefore, the prediction performance of the $EARN$ and CFO may therefore vary by country, depending on the accounting standards applied in each.

However, the results of the FEM show that the $EARN$ model is significantly superior in predicting the one-year-ahead CFO compared to the CFO model in the GCC and the non-GCC as shown in Tables A.3 and A.4 in the Appendix. This might be due to the large number of companies in the MENA region that are adhering to domestic standards similar to the US GAAP during the sample period. Therefore, it is expected that, when firms in the MENA region fully converge from the domestic financial standards to the IFRS, the existing complexity, conflict, and confusion created by inconsistency and the lack of uniform accounting standards in financial reporting across countries is going to be alleviated, and also inconsistency in the results of the cash flow prediction research is expected to disappear.

Finally, the analysis of the PRM and FEM of the GCC country firms reaffirms that the full disaggregation model is still the best among the other models. However, the FEM analysis of the non-GCC country firms does not support the disaggregation notion when predicting the one-year-ahead CFO, while the PRM analysis of non-GCC supports this notion. Next section extends the analyses that are reported in Section 5.4 by examining the six prediction models in an out-of-sample period.

5.5 Out-of-Sample Prediction Analysis

The regression analysis estimates described above, the first stage of the prediction process, makes an implicit assumption of constancy of coefficients across firms and through time. However, in practice, differences between firms and time variation of coefficients estimates are critical issues in prediction. Therefore, the second stage of the prediction process runs a cross-sectional regression of each of the above six cash flow prediction models for each industry and year to get the estimated parameters. Then, these estimated parameters are multiplied by the predictors to obtain firm specific predicted values for the one-year-ahead CFO, consistent with Kim and Kross (2005) and Lev *et al*. (2010). Then, firm specific prediction error in a given year is computed as the absolute difference between the actual and predicted values of the one-year-ahead CFO. To evaluate the quality of the CFO predictions, the mean and median of the pooled $ABSE$ are calculated. A low mean and median of the $ABSE$ implies that the predictive ability of the model is high.

Table 5.7 presents summary statistics for the mean and median of the $ABSE$ for each of the six prediction models. To test whether the means of the $ABSE$ differ between models, both t-test and bootstrapping are used and reported in Table 5.7. Furthermore, Wilcoxon signed rank test is used to test whether the medians of the $ABSE$ differ between the models for the MENA region and the results are reported in Table 5.7.

Table 5.7: The Mean and Median of the Firm-Specific Absolute Prediction Errors of the MENA Region Firms

	Mean						Median					
Prediction Models	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	0.057	**0.057**	**0.054**	**0.058**	**0.073**	**0.084**	**0.044**	**0.042**	**0.041**	**0.044**	**0.048**	**0.047**
Versus	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	z-value	z-value	z-value	z-value	z-value	z-value
Model 2	0.189 [-0.54]						0.349					
Model 3	6.882*** [6.55***]	6.408*** [7.47***]					8.942***	8.479***				
Model 4	-2.049** [-2.84***]	-2.123** [-2.39**]	-5.674*** [-6.50***]				3.013*	3.079***	-1.759***			
Model 5	-2.353** [-2.91***]	-2.377** [-2.88***]	-2.694*** [-3.24***]	-2.141** [-2.61***]			-6.172***	-8.102***	-12.590***	-8.915***		
Model 6	-3.328*** [-3.62***]	-3.346*** [-3.59***]	-3.621*** [-3.90***]	-3.150*** [-3.37***]	-4.548*** [-3.95***]	-	-6.771***	- 6.965 ***	-11.634***	-11.141***	-0.256	-
Number of Observations	**4,556**											

This table reports mean and median of the absolute prediction errors ($ABSE$) where CFO_{t+1} is predicted using six prediction models estimated using cross-sectional regression for firms in the MENA region countries. In addition, the table reports the t-statistics of t-test and the z-values of the bootstrapping technique (in square brackets) that are employed to test whether there is a significance difference between the means of the $ABSE$ of the six models. Furthermore, the table shows the z-values of the Wilcoxon signed rank test that is employed to test if there is a significant difference between the medians of the $ABSE$ of the six models. A significance indicator next to t-statistics (z-values) means that mean (median) of $ABSE$ of a model in the vertical column is significantly lower (greater) than the mean of $ABSE$ of a model in the horizontal row. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5.7 shows that the difference in the mean $ABSE$ using t-test (bootstrapping) and the median $ABSE$ using Wilcoxon signed rank of all the prediction models are statistically significant at conventional levels except the difference between the $EARN$ model and the CFO model. By comparing the mean and median of $ABSE$ of both models, it is found that both models have approximately equal means and medians. The means (medians) of the $ABSE$ for the $EARN$ model and the CFO model are 0.057(0.044) and 0.057(0.042), respectively. Consequently, these results indicate that both models have almost the same ability in predicting the one-year-ahead CFO in the MENA region firms. The out-of-sample results concerning these two models are similar to the PRM analysis, while these results are unlike the FEM findings which find that current $EARN$ has a superior predictive ability compared to the current CFO. However, although in-sample and out-of-sample analyses show conflicting results, both reject Hypothesis 3 which exhibits that the current CFO is superior compared to the current $EARN$ in predicting the one-year-ahead CFO.

Although the out-of-sample results of this thesis contradict previous research that normally favours one model over another (e.g., Kim and Kross, 2005; Lev *et al.*, 2010), these results can be attributed to the different accounting standards employed by the different countries in the MENA region as indicated in Section 5.4.3. Specifically, since the $EARN$ model outperforms in countries that use the domestic standards similar to the US GAAP and the CFO model outperforms in countries that use the IFRS, it is expected that, when applying the analysis on the MENA region as a whole, no model is expected to outperform the other.

Overall, although one of the main objectives of this thesis is to determine which of the $EARN$ model or the CFO model can provide superior prediction of the one-year-ahead CFO in the MENA region firms, the results of this chapter do not provide clear evidence on this issue. Thus, this necessitates further investigation in future research on this topic to provide practitioners and academics with conclusive evidence on the performances of both models and which of these models should be used in the MENA region.

Further, Table 5.7 shows that the mean and median of the $ABSE$ of Model 3, which contains the disaggregated components of $EARN$ (CFO and total ACC), are 0.054 and 0.041, respectively. This reveals that the predictability of Model 3 is higher than that of Model 1 ($EARN$ model). These results re-confirm the in-sample regression findings that current aggregate $EARN$ do not outperform current CFO and total ACC together in predicting the one-year-ahead CFO. Thus, these results show that disaggregating $EARN$ into CFO and total ACC enhances its ability to predict the one-year-ahead CFO compared to aggregate $EARN$, supporting Hypothesis 2.1

Moreover, Table 5.7 shows that the predictive ability of the current CFO and total ACC together (Model 3) is higher than that of the current CFO alone (Model 2), given the means and medians of the $ABSE$ of both models. It thus appears that the addition of total ACC to the current CFO in Model 3 contributes towards improving the prediction of the one-year-ahead CFO as depicted by the lower mean and median of the $ABSE$ of Model 3 compared to that of Model 2 that uses the current CFO alone. Consistent with the in-sample regression analysis, the results show that total ACC helps improve the one-year-ahead CFO prediction upon current CFO alone. Therefore, these results re-confirm that cash flow data alone is insufficient in predicting the one-year-ahead CFO, but it should be used in conjunction with ACC data, consistent with Francis and Eason (2012).

Turning to Model 4, this model examines whether disaggregating ACC into individual components helps improve upon aggregate $EARN$ (Model 1) and total ACC (Model 3) in predicting the one-year-ahead CFO. Table 5.7 shows that the mean and median of the $ABSE$ derived from Model 4, which employs both the CFO and the ACC components as predictors, is significantly higher than Model 1 and Model 3. Although the in-sample regression analysis reveals further improvement in predicting the one-year-ahead CFO when the ACC is further disaggregated into its individual components, the out-of-sample prediction tests shows that ACC disaggregation does not significantly improve the one-year-ahead prediction accuracy, consistent with Nam *et al*. (2012). Therefore, Hypothesis 2.2 which suggests that disaggregating $EARN$ into CFO and disaggregated ACC components enhance its predictive ability relative to the aggregate $EARN$ is rejected.

Comparing Model 2 (the CFO model) with Model 5 (the disaggregated CFO model), it is found that Model 2 have lower mean and median of the $ABSE$ than Model 5. Although the results of the in-sample analysis show that the explanatory power of Model 5 is improved when the CFO is disaggregated into the DM components, the out-of-sample regression analysis does not support the disaggregation concept. Thus, the under-performance of Model 5 relative to Model 2 indicates that the DM components results in noisy predictions than aggregate CFO, rejecting Hypothesis 1. To sum up, Model 4 and Model 5, where the former examines the importance of disaggregating ACC components and the latter examines the importance of disaggregating the CFO components, have lower predictive ability than the aggregate models (Model 3 and Model 2).

Therefore, it is obvious that Model 3 yields significantly the lowest mean and median of the $ABSE$ among all the prediction models even lower than Model 6 (the full disaggregation model). According to the out-of-sample results, Model 3 is the best prediction model for the one-year-ahead CFO in the MENA region listed companies. However, in-sample regression results find that the model that contains disaggregated CFO along with dissagregated ACC (Model 6) is the best model to predict the CFO in the MENA region listed companies. Nonetheless, the out-of-sample analysis shows that this model (full disaggregation model) has the lowest predictive ability compared to other models. Accordingly, the full disaggregation model does not improve the accuracy of the one-year-ahead CFO predictions. Therefore, out-of-sample results reject Hypothesis 4.

Consequently, the out-of-sample prediction tests highlight that disaggregation is not a good choice in predicting the one-year-ahead CFO, except disaggregating $EARN$ into CFO and total ACC. Specifically, the results of the out-of-sample prediction tests show that neither the prediction derived from the full disaggregation model (Model 6), nor the two prediction models based on the disaggregated CFO components (Model 5) or the disaggregated ACC components (Model 4) outperforms the prediction models based on aggregate $EARN$ (Model 1) or aggregate CFO (Model 2). The mean and median of the $ABSE$ of Models 4, 5 and 6 are significantly larger than that of the $EARN$ model and CFO model. Hence, there is no statistically significant improvement in the prediction accuracy of the one-year-ahead CFO when disaggregating CFO or ACC into their individual components. Therefore, it is obvious that the in-sample regression test does not sufficiently penalize the addition of a new variable as long as it is significant, which actually affect the parsimonious nature of Models 4, 5 and 6.

These results are consistent with Cheng and Hollie (2008) who find that although disaggregated models have the highest adjusted R-squared statistics compared to the other aggregated models, they have the highest out-of-sample prediction errors compared to other simple model such as the CFO model. They argue that despite the poor performance of disaggregated models in the out-of-sample test, these models are still useful in predicting the $FCFO$. Specifically, these models help identify the relationship between the $FCFO$ and a wide array of predictors. This, in turn, can help financial analysts to understand the stability of the components for each firm and assign different weights to the CFO and ACC components when predicting the $FCFO$.

Even when separating the analysis to the GCC and non-GCC country firms in Appendix A, the results shows that there are not any significant gains when disaggregating CFO and ACC into their individual components when predicting the one-year-ahead CFO. Moreover, the analysis shows that there is insignificant difference between the mean and median of $ABSE$ of the $EARN$ prediction model and the CFO prediction model as shown in Tables A.5 and A.6 in the Appendix. Therefore, according to the out-of-sample prediction test, a good prediction model requires aggregate variables of $EARN$, CFO and ACC rather than their disaggregated components.

In conclusion, the results of this thesis show that the explanatory powers of the six prediction models are improved when $EARN$, CFO and ACC are disaggregated. However, this does not mean that out-of-sample prediction errors are similarly improved. Therefore, superiority in goodness of fit (e.g., adjusted R-squared statistics) does not necessarily translate into superiority in predictive ability, consistent with Watts and Leftwich (1977).

Since the results of in-sample and out-of-sample tests are inconsistent and because the out-of-sample prediction tests are more reliable than in-sample regression analysis, thus this thesis suggests that prediction models should be tested by out-of-sample prediction tests.

5.6 Conclusion

This chapter presents and discusses the results of the cash flow prediction models. The chapter investigates the role of $EARN$ and its components in predicting the one-year-ahead CFO by examining six prediction models. The statistical tests of this chapter are aimed at addressing the empirical issue of whether the disaggregation of $EARN$, CFO and ACC into their components improves cash flow prediction accuracy. The data set used in this chapter is pooled across years and firms. It can be considered an unbalanced panel data set, since not all the MENA region firms provide data for all years between 2005 and 2018.

The predictive ability of each model is measured by two main approaches which are (i) in-sample regression analysis; and (ii) out-of-sample prediction tests. The in-sample regression analysis is conducted through estimating the model parameters by the traditional PRM, consistent with the prior studies, and then by the FEM. The PRM is performed under the assumption that intercept and coefficients remain constant across firms, while there are systematic differences between firms. These firm-specific variations can be controlled using an econometric method called the FEM. Thus, these two estimators are used in this chapter to calculate the adjusted R-squared statistics of each model. Then, comparing the adjusted R-squared of each model and assessing any statistical significant increase in the adjusted R-squared statistic of one model over another by bootstrapping method. The AIC and BIC metrics are also employed to evaluate the fit of a regression model while penalising the addition of increasingly large number of independent variables.

The in-sample regression analysis shows that the model with the significantly highest adjusted R-squared statistic in the MENA region firms is the full disaggregation model which contains the all components of both CFO and ACC. Moreover, the in-sample regression analysis reveals that all the models with the disaggregated components have a higher adjusted R-squared statistics than models with aggregate variables (i.e., $EARN$ model and CFO model). As a result, it is suggested that for predictive purposes, it is better if all the CFO and ACC components are retained in the regression models. However, the in-sample regression analysis does not provide evidence which from $EARN$ or CFO have a superior ability in predicting the one-year-ahead CFO in the firms of the MENA region.

The prediction models are re-tested by out-of-sample prediction tests rather than relying on comparing the adjusted R-squared statistics of different models through in-sample regression analysis. The absolute prediction error is calculated in an out-of-sample period to get the prediction error of each model. If the value of pooled absolute prediction error is low, then this indicates that the model has high predictive ability. Then, the mean and median of the prediction errors are computed to compare the predictive ability in pairs using t-test (bootstrapping) for means, and the Wilcoxon signed rank test for the medians.

In contrast to the in-sample regression analysis, the out-of-sample prediction test shows that the addition of either CFO components or ACC components in any model does not improve substantially the prediction of one-year-ahead CFO. While the predictive ability of current CFO and total ACC together as predictors in the same model is the best among all the other prediction models. However, still determining which model from current $EARN$ or CFO is superior in predicting the one-year CFO is not clear under either the out-of -sample or in-sample analysis in the MENA region firms. Finally, Table 5.8 provides the hypotheses test results under in-sample regression analysis and out-of-sample prediction tests for the MENA region firms.

Table 5.8: Hypotheses Test Results

	In-Sample Regression Analysis		**Out-of-Sample Prediction Tests**
Hypothesis	PRM	FEM	
H1: Current CFO disaggregated into DM components is superior compared to aggregate CFO in predicting the one-year-ahead CFO.	Accepted	Accepted	Rejected
H2.1: Current $EARN$ disaggregated into CFO and total ACC is superior compared to aggregate $EARN$ in predicting the one-year-ahead CFO.	Accepted	Rejected	Accepted
H2.2: Current $EARN$ disaggregated into CFO and ACC components is superior compared to aggregate $EARN$ in predicting the one-year-ahead CFO.	Accepted	Accepted	Rejected
H3: Current CFO is superior compared to current $EARN$ in predicting the one-year-ahead CFO.	Rejected	Rejected	Rejected
H4: Current $EARN$ disaggregated into the DM and ACC components is superior to current $EARN$ disaggregated into aggregate CFO and total ACC in predicting the one-year-ahead CFO.	Accepted	Accepted	Rejected

The results provided up to this point are averaged across many countries in the MENA region with different economic and financial reporting attributes. Therefore, extra analysis is conduced to separate between GCC and non-GCC country firms to control the different country specific issues such as accounting standards, audit quality and regulatory oversight which can impact a study's results. The results of GCC and non-GCC country firms are to a great extent consistent with the findings of the MENA region firms. The only difference is that the predictive ability of $EARN$ is superior to CFO in non-GCC country firms under the all the in-sample regression analyses. Next chapter provides the second empirical results of this thesis which examine the effect of earnings management and unintentional managerial errors on the predictive ability of $EARN$ and its components.

Chapter 6

The Effect of Earnings Management and Unintentional Managerial Errors on the Predictive Ability of Earnings and its Components

6.1 Introduction

This thesis aims to provide a comprehensive analysis of the ability of $EARN$ and its components, CFO and ACC, in predicting the one-year-ahead CFO, and the factors that might affect their predictive abilities. After determining in Chapter 5 which model has the superior predictive ability in the MENA region firms, this chapter continues by examining some of the variables that might affect the predictive ability of $EARN$ and its components.

Therefore, the focus of this chapter is to understand the effect of firm's earnings management behavior and unintentional managerial errors in estimating accruals on the predictive ability of $EARN$ and its components. Although existing literature shows that earnings management can be achieved through various forms such as discretionary accruals and real activities manipulation, cash flow prediction literature focuses mainly on analysing the impact of discretionary accruals on the performance of cash flow prediction models. Thus, to fill in this gap and extend the literature on cash flow prediction, this thesis aims to explicitly consider the implication of the two earnings management approaches to provide a more complete picture about the effect of the firms' earnings management behavior on the ability of $EARN$ and its components in predicting the one-year-ahead CFO.

In addition, this thesis aims to determine the effect of unintentional estimation errors arising from the uncertainty associated with the company's operating environment on the predictive ability of $EARN$ and its components. Further, this chapter analyses how the determinants of managerial unintentional errors which are proxied by five firm-specific characteristics, firm size, CFO volatility, sales volatility, firm's operating cycle length, and frequency of reporting negative $EARN$ as suggested by Dechow and Dichev (2002) and Francis *et al*. (2005), can affect the predictive ability of $EARN$ and its components.

To sum up, this chapter aims to answer the second research question of this thesis which is whether earnings management and unintentional managerial errors affect the ability of $EARN$ and its components in predicting the one-year ahead CFO for firms in the MENA region over the time period 2008 to 2017.

This chapter is organized as follows. Section 6.2 provides the descriptive statistics for the absolute cash flow prediction errors, accruals contribution, earnings management metrics and unintentional managerial errors. Section 6.3 presents and discusses the correlation analysis between all the variables used in this chapter. Section 6.4 presents the regression analysis results. Finally, Section 6.5 concludes.

6.2 Descriptive Analysis

This section aims to provide an overview on all the variables used in this chapter to gain a clear understanding of the variables. The dependent variables in this chapter are the absolute errors from predicting the one-year-ahead CFO results from the $EARN$ and CFO models as calculated in Chapter 5 which are $ABSE_{EARN}$ and $ABSE_{CFO}$, respectively. In addition, the ACC_CONT, which represents the ACC contribution over the current CFO alone in predicting the one-year-ahead CFO, is calculated as the difference between the absolute prediction error of the CFO as the only predictor and the absolute prediction error using the CFO and total ACC together as predictors. The higher the ACC_CONT, the greater the contribution of ACC compared to the ability of the current CFO alone to predict the one-year-ahead CFO.

The independent variables are discretionary accruals (DIS_ACC), unintentional managerial errors ($Innate\_ACC$) and real earnings management (RM_PROXY). DIS_ACC and $Innate\_ACC$ are measured through the technique developed by Francis *et al*. (2005) which separates the Dechow and Dichev (2002) measure of accruals quality into its discretionary and innate components. The accruals quality measure is regressed against five firm-specific characteristics to determine the innate and discretionary portion of accruals quality. On the one hand, the predicted values of the firm-specific characteristics jointly are the innate portion of accruals quality, which represents the unintentional managerial errors ($Innate\_ACC$). On the other hand, the discretionary accruals(DIS_ACC) are the firm-year specific residuals.

Given the results of Dechow and Dichev (2002) and Francis *et al*. (2005) that the firm-specific characteristics, independently affect the accruals quality, this chapter aims to extend these results and determine if these characteristics jointly affect the predictive ability of $EARN$ and its components as represented by the unintentional managerial errors ($Innate\_ACC$), as well as testing whether each of these characteristics independently affect the predictive ability of $EARN$ and its components. These characteristics are firm size measured as the natural logarithm of total assets ($SIZE$), the standard deviation of the CFO over the past five years (σCFO), the standard deviation of sales over the past five years ($\sigma SALES$), the natural logarithm of firm's operating cycle length measured as sum of average collection period and days' sales in inventory ($OperCycle$), and the number of years out of the past five years, where firm reported negative $EARN$ ($NegEARN$).

Real earnings management is estimated using the three models developed by Roychowdhury (2006). These estimation models attempt to identify manipulations of real activities through accelerating sales by price discounts, reporting lower COGS by overproduction, or reducing discretionary expenditures (e.g., R&D, advertising, and other selling, general, and administrative expenses). Thus, the three models are the abnormal levels of CFO (AB_CFO), production costs (AB_PROD) and discretionary expenditures (AB_DISEXP). In addition, these three models are combined into one comprehensive metric of real earnings management (RM_PROXY).

Before analyzing the results of this chapter, it is worth mentioning that the sample size of this chapter is smaller than that of Chapter 5 due to the following reasons. First, variables such as the standard deviation of the CFO and sales require prior five years data to be calculated. Second, the sample of this chapter ends in 2017 because the accruals quality measure requires at least one year of future realizations. Finally, in order to avoid the confounding impact that may arise due to using a sample of observations pertaining to different firms, the sample is restricted to firm-years with complete data throughout the sample period. Thus, the final sample includes 2,360 firm-years (ten different industries) spanning the ten-year period from 2008–2017.

This chapter begins with the descriptive statistics of the estimation models used to calculate earnings management and unintentional managerial errors, and then presents descriptive statistics for all the variables used in the analysis of this chapter. Table 6.1 presents the descriptive statistics for the mean value of the coefficients and the average adjusted R-squared statistics for the estimation models. Each model is estimated based on cross-sectional regression for every industry-year with at least eight observations over the period from 2008 to 2017. T-statistics are calculated as in Fama and Macbeth (1973) to take into consideration cross-sectional correlation.

Panel A of Table 6.1 shows that accruals quality measure developed by Dechow and Dichev (2002) and modified by Francis *et al*. (2005) is the result of regressing the changes in total current accruals on past, current, and future CFO, augmented with the fundamental variables from the Jones (1991) model which are changes in revenues and PPE. The residual from this regression is a measure of accruals estimation errors. The standard deviation of these residuals over two years is the firm-specific measure of accruals quality, where a higher standard deviation signifies lower accruals quality. Then, the innate portion of accruals quality is a function of five firm-specific characteristics reflecting economic fundamentals and the residuals are the portion of discretionary accruals as presented in Panel B in Table 6.1.

Panel B of Table 6.1 shows that the results are consistent with prior findings reported by Dechow and Dichev (2002) and Francis *et al*. (2005). The results suggest that the five firm-specific characteristics are reasonable proxies for economic fundamentals that drive accruals quality. All of the coefficients of the five variables have the predicted signs and are statistically significant at the conventional levels. All of the firm-specific characteristics are negatively related to accruals quality except $SIZE$ which is positively related to it. The average adjusted R-squared statistics of this regression is 0.10; however Francis *et al*. (2005) report higher explanatory power which equals to 0.45. This means that most of the variation in accruals quality in the MENA region firms is due to discretionary accruals rather than the unintentional managerial errors.

Table 6.1: Model Parameters

Panel A	Model Parameters of Estimating the Accruals Quality Measure		
	Coeff	t-statistics	Expected Sign
CFO_{t-1}	0.209***	10.52	+
CFO_t	-0.714***	-25.89	-
CFO_{t+1}	0.178***	7.38	+
ΔRev_t	0.069***	4.58	+
PPE_t	-0.039***	-10.68	-
Constant	0.032***	3.33	
Mean Adjusted R-squared	0.53		
Panel B	**Model Parameters of Estimating the Innate and Discretionary Components of Accruals Quality Measure**		
$SIZE_t$	-0.001**	-2.71	-
σCFO_t	0.088***	6.21	+
$\sigma SALES_t$	0.021***	4.29	+
$OperCycle_t$	0.001**	2.35	+
$NegEARN_t$	0.026***	5.59	+
Constant	0.025***	5.90	
Mean Adjusted R-squared	0.10		
Panel C	**Model Parameters of Estimating Normal level of CFO**		
$1/TA_{t-1}$	-184.248**	-2.65	-
$SALES_t/TA_{t-1}$	0.040***	10.49	+
$\Delta SALES_t/TA_{t-1}$	-0.007	-0.33	-
Constant	0.055***	12.29	
Mean Adjusted R-squared	0.17		
Panel D	**Model Parameters of Estimating Normal level of Production Costs**		
$1/TA_{t-1}$	22.009	0.62	-
$SALES_t/TA_{t-1}$	0.898***	96.85	+
$\Delta SALES_t/TA_{t-1}$	-0.035	-0.88	+
$\Delta SALES_{t-1}/TA_{t-1}$	0.003	0.10	-
Constant	-0.099***	-19.75	
Mean Adjusted R-squared	0.88		
Panel E	**Model Parameters of Estimating Normal level of Discretionary Expenditures**		
$1/TA_{t-1}$	409.971	1.27	+
$SALES_{t-1}/TA_{t-1}$	0.062***	17.25	+
Constant	0.022**	2.13	
Mean Adjusted R-squared	0.26		

This table reports the estimated parameters in the following regressions:
Panel A: $TCA_{it} = \beta_0 + \beta_1 CFO_{it-1} + \beta_2 CFO_{it} + \beta_3 CFO_{it+1} + \beta_4 \Delta Rev_{it} + \beta_5 PPE_{it} + \varepsilon_{it}$
Panel B: $AQ_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it} + \varepsilon_{it}$
Panel C: $CFO_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it}/TA_{it-1} + \alpha_3 \Delta SALES_{it}/TA_{it-1} + \varepsilon_{it}$
Panel D: $PROD_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it}/TA_{it-1} + \alpha_3 \Delta SALES_{it}/TA_{it-1} + \alpha_4 \Delta SALES_{it-1}/TA_{it-1} + \varepsilon_{it}$
Panel E: $DISEXP_{it}/TA_{it-1} = \alpha_0 + \alpha_1 1/TA_{it-1} + \alpha_2 SALES_{it-1}/TA_{it-1} + \varepsilon_{it}$
The table reports t-statistics calculated as in Fama and Macbeth (1973) to take into consideration cross-sectional correlation. The table also reports the mean adjusted R-squared statistics for each of these regressions. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Turning to the three real earnings management proxies as developed by Roychowdhury (2006), the normal levels of CFO, production costs and discretionary expenditures should be estimated first as shown in Panels C, D and E in Table 6.1, respectively. Then, the abnormal levels are computed as the difference between the actual values and the normal levels predicted from these models. Most of the coefficient estimates of the CFO and discretionary expenditures models are significant and with the predicted signs. One exception is the production cost model where all the variables are insignificant except the $SALES_t/TA_{t-1}$ which is statistically significant at the 1% level. Therefore, the results related to the abnormal production costs should be interpreted cautiously. The three models equations seem to have reasonable explanatory power but lower than that of Roychowdhury (2006). The average adjusted R-squared statistics are 0.17 for CFO, 0.88 for production costs, and 0.26 for discretionary expenditures.

Table 6.2 presents descriptive statistics for all the variables used in the regression models of this chapter. Table 6.2 shows the mean, median, standard deviation, minimum and maximum values for both dependent and independent variables. Given that this thesis focuses on the MENA region, the descriptive statistics are presented for the MENA region firms as a whole as well as for the GCC and non-GCC country firms separately to explore any potential significant differences in the means of the variables between these two areas using a two tailed t-test. The GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. The non-GCC countries include Egypt, Jordan, Morocco, and Tunisia.

Table 6.2: Descriptive Statistics for the Variables of the Cash Flow Prediction Errors, Accruals Contribution, Earnings Management and Unintentional Managerial Errors

	GCC					Non-GCC						MENA Region				
Variables	**Mean**	**Median**	**SD**	**Min**	**Max**	**Mean**	**Median**	**SD**	**Min**	**Max**	**t-statistics**	**Mean**	**Median**	**SD**	**Min**	**Max**
$\boldsymbol{ABSE_{EARN}}$	0.054	0.041	0.047	0.000	0.315	0.062	0.046	0.057	0.000	0.372	-3.877***	0.057	0.043	0.051	0.000	0.372
$\boldsymbol{ABSE_{CFO}}$	0.052	0.039	0.046	0.000	0.312	0.063	0.047	0.059	0.000	0.354	-5.095***	0.056	0.042	0.051	0.000	0.354
$\boldsymbol{ACC\_CONT}$	0.002	0.001	0.020	-0.123	0.117	0.002	0.001	0.023	-0.126	0.089	-0.330	0.002	0.001	0.021	-0.126	0.117
$\boldsymbol{DIS\_ACC}$	-0.001	-0.004	0.021	-0.053	0.102	-0.002	-0.005	0.024	-0.053	0.111	1.287	-0.001	-0.004	0.022	-0.053	0.111
$\boldsymbol{SIZE}$	5.563	5.573	0.667	3.805	7.256	4.944	4.891	0.682	3.433	7.003	21.627***	5.333	5.339	0.736	3.433	7.256
$\boldsymbol{\sigma CFO}$	0.056	0.047	0.038	0.005	0.289	0.070	0.058	0.047	0.005	0.304	-7.604***	0.061	0.051	0.042	0.005	0.304
$\boldsymbol{\sigma SALES}$	0.080	0.065	0.064	0.005	0.334	0.094	0.077	0.066	0.005	0.331	-5.126***	0.085	0.070	0.065	0.005	0.334
$\boldsymbol{OperCycle}$	3.236	3.364	1.338	-0.812	7.892	3.471	3.528	1.361	-0.690	7.778	-4.097***	3.323	3.406	1.351	-0.812	7.892
$\boldsymbol{NegEARN}$	0.099	0.000	0.215	0.000	1.000	0.154	0.000	0.252	0.000	1.000	-5.629***	0.119	0.000	0.231	0.000	1.000
$\boldsymbol{Innate\_ACC}$	0.026	0.023	0.015	-0.033	0.098	0.029	0.027	0.015	-0.013	0.095	-5.647***	0.027	0.025	0.015	-0.033	0.098
$\boldsymbol{AB\_CFO}$	-0.003	0.000	0.089	-0.316	0.357	0.021	0.021	0.100	-0.315	0.350	-6.057***	0.006	0.006	0.094	-0.316	0.357
$\boldsymbol{AB\_PROD}$	-0.008	0.002	0.098	-0.358	0.321	0.013	0.017	0.104	-0.355	0.335	-4.774***	0.000	0.007	0.101	-0.358	0.335
$\boldsymbol{AB\_DISEXP}$	-0.008	0.004	0.056	-0.263	0.143	0.008	0.013	0.051	-0.256	0.134	-6.704***	-0.002	0.007	0.055	-0.263	0.143
$\boldsymbol{RM\_PROXY}$	-0.018	0.004	0.191	-0.774	0.538	0.042	0.048	0.191	-0.652	0.758	-7.364***	0.004	0.017	0.193	-0.774	0.758
Number of Observations	1,482						878					2,360				

This table presents the descriptive statistics for the variables of absolute cash flow prediction errors, accruals contribution, earnings management and unintentional managerial errors. The mean, median, standard deviation, minimum and maximum values are presented in the columns for the GCC country firms, non-GCC country firms, and the MENA region combined. The t-statistics column reports the t-statistics to identify any potential significant differences in means for each of the variables between GCC and non-GCC country firms. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively. GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Non-GCC countries include Egypt, Jordan, Morocco, and Tunisia. Variables definitions: $ABSE_{EARN}$ is the absolute prediction error of $EARN$ model; $ABSE_{CFO}$ is the absolute prediction error of CFO model; ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model, where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$; DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model as modified by Francis *et al*. (2005); $SIZE$ is natural logarithm of total assets; σCFO is the standard deviation of firm's CFO over the past five years; $\sigma SALES$ is the standard deviation of firm's sales over the past five years; $OperCycle$ is the natural logarithm of firm's operating cycle, where $OperCycle = 360(\frac{\Delta\ A/R}{SALES}) + 360(\frac{\Delta\ INV}{COGS})$; $NegEARN$ is the number of years out of the past five years, where firm reported $EARN$ < zero; $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the modified Dechow and Dichev (2002) model, where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it}$; AB_CFO refers to abnormal CFO scaled by lagged total assets; AB_PROD refers to abnormal production costs scaled by lagged total assets; AB_DISEXP refers to abnormal discretionary expenditures scaled by lagged total assets; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. All variables are trimmed at the 1 percent and 99 percent levels. The sample used in this chapter contains 2,360 observations over 2008–2017.

Table 6.2 shows that the means of all the variables used in this chapter differ significantly between the GCC and non-GCC country firms at the 1% level, except the level of discretionary accruals and ACC contribution. Thus, the descriptive statistics illustrate that there are significant differences between the GCC and non-GCC country firms in the absolute cash flow prediction errors, the level of real earnings management, unintentional managerial errors and firm-specific characteristics. Therefore, two main analyses are conducted in this thesis, one for the MENA region as whole, and then further analysis is conducted on two separate sub-samples for the GCC and non-GCC country firms.

The descriptive analysis shows that there are significant differences between the $ABSE$ of both the $EARN$ and CFO prediction models in the GCC and non-GCC country firms. Specifically, the results show that the GCC country firms exhibit lower cash flow prediction errors compared to their counterparts in the non-GCC. Nonetheless, despite the significant difference in the $ABSE$ between both regions, the results show that the descriptive statistics of the $ABSE$ of the $EARN$ and CFO prediction models in each of the GCC, non-GCC and MENA region firms are almost the same which support the results of Chapter 5 that there is insignificant difference between these two models in predicting the one-year-ahead CFO in the firms of GCC, non-GCC and MENA region countries.

Table 6.2 clarifies that the ACC_CONT does not differ significantly between the GCC and non-GCC country firms. The means and medians of ACC_CONT is positive in the GCC, non-GCC and MENA region firms which means that the addition of total ACC to the current CFO help reduce the $ABSE$ of predicting the one-year-ahead CFO at mean and median levels. The incremental contribution of ACC in predicting the one-year-ahead CFO is expected because the results of Chapter 5 show that the prediction model which contains the current CFO and total ACC generate significantly lower cash flow prediction error than the prediction model that contains the CFO only as a predictor.

The descriptive statistics also show that the DIS_ACC does not differ significantly between the GCC and non-GCC country firms. The mean and median values of DIS_ACC are negative and close to zero for the GCC, non-GCC and MENA country firms, consistent with Subramanyam (1996). The negative mean and median of DIS_ACC may be an indication that firms in the MENA region generally are managing their income downwardly through engaging in more income-decreasing DIS_ACC compared with income-increasing DIS_ACC on average, maybe aiming to pay fewer taxes and contributions (Erickson, Hanlon and Maydew, 2004) or to avoid political and social costs that may be incurred as a result of the announcement of a high profit (Alareeni, 2018; Bugshana, Lafferty, Bakry and Li, 2018).

Further, the mean differences in the determinants of $Innate\_ACC$ between the GCC and non-GCC country firms are significant. $SIZE$ in the GCC country firms has a mean of 5.563 compared to 4.944 in the non-GCC countries. This, in turn, suggests that the GCC country firms are significantly larger than their counterparts in the non-GCC countries on average. The non-GCC country firms have significantly higher mean values for both the standard deviation of the CFO and sales than the GCC country firms. The means of σCFO and $\sigma SALES$ in the non-GCC country firms are 0.070 and 0.094, respectively, while the firms in the GCC countries exhibit lower means of 0.056 and 0.080, respectively. This means that the non-GCC country firms experience more volatile CFO and sales than the GCC country firms.

Moreover, the mean of $OperCycle$ is higher in the non-GCC countries compared to the GCC countries. This implies that the non-GCC country firms have a longer operating cycle, on average, than the GCC country firms. Moreover, the frequency of reporting negative $EARN$ is significantly higher in firms of the non-GCC countries than their counterparts in the GCC countries. On average, the non-GCC country firms report 15.4% $NegEARN$ compared to the GCC country firms that report 9.9%.

To sum up, the descriptive analysis reveals that the non-GCC country firms have more volatile CFO and sales levels, longer operating cycle, and are more likely to report a higher proportion of losses and are smaller than the GCC country firms. Therefore, on aggregate level, the mean and median of $Innate\_ACC$ is significantly higher in the non-GCC country firms than the GCC country firms. These results imply that the unintentional managerial errors are higher in the non-GCC country firms which, in turn, justify the results that the cash flow prediction errors of $EARN$ and CFO models in the GCC country firms are lower than that of the non-GCC country firms.

Descriptive statistics about the determinants of $Innate\_ACC$ in the MENA region firms are similar to those reported by prior studies in the US firms (e.g., Dechow and Dichev, 2002; Francis *et al.*, 2005). The mean values for the determinants of $Innate\_ACC$ in the MENA region firms are 5.33 for $SIZE$, 0.061 for σCFO; 3.323 for $OperCycle$; and 11.9% for $NegEARN$; in comparison, Francis *et al.* (2005) report mean values of 4.80 for $SIZE$, 0.094 for σCFO; 4.707 $OperCycle$; and 19.3% for $NegEARN$. One exception is that both studies show that the volatility of sales in the US is almost three times higher than the volatility in the MENA region countries. This might be due to earnings management as managers might report a stable sales stream every year to avoid being detected of manipulating earnings. Additionally, this might be due to the difference in calculating the volatility of sales, where Francis *et al.* (2005) use ten years to calculate the volatility of sales while this thesis uses only five years due to data limitations.

According to Roychowdhury (2006), firms that manage earnings upward through real activities are likely to have one or all of these: unusually low CFO, and/or unusually high production costs and/or unusually low discretionary expenditures. Therefore, firms are considered having income-increasing earnings management when the abnormal CFO and abnormal discretionary expenditures are negative, while abnormal production costs is positive. Since, as mentioned in Chapter 4, AB_CFO and AB_DISEXP are multiplied by -1, while AB_PROD is not multiplied by -1 as it already implies higher levels of real activities, then positive values of any of the three real earnings management proxies or the aggregate proxy (RM_PROXY) means that the firms undertake high levels of real activities to manipulate earnings upward.

The descriptive statistics show that the means of AB_CFO, AB_PROD and AB_DISEXP of the GCC country firms are significantly different from those of the non-GCC country firms. The descriptive statistics show that the means of these three real earnings management metrics are positive for the non-GCC country firms, while negative for the GCC country firms. The positive means of AB_CFO, AB_PROD, AB_DISEXP suggest that the non-GCC country firms, on average, engage more in income-increasing real earnings management behaviour through sales manipulation, overproduction strategy and reduction of discretionary expenditures. However, the negative means for the GCC country firms indicates that these firms attempt to manage earnings downward by implementing income-decreasing real earnings management strategy.

Since firms might engage in more than one type of real earnings management simultaneously, the aggregate variable is calculated by combining the three individual real earnings management variables. On the aggregate level, the degree of real earnings management significantly differs between the GCC and non-GCC country firms. The mean for RM_PROXY is -0.018 for the GCC country firms and 0.042 for the non-GCC country firms. Thus, the aggregate effect of real activities manipulation supports the previous results that earnings is managed downwards in the GCC country firms, while upwards in the non-GCC country firms.

Bugshana *et al*. (2018) provide evidence that the firms in the GCC countries use the income-decreasing real earnings management strategy because of the dramatic decrease in the oil prices since the mid-2014. They argue that this strategy may have occurred for two reasons. First, fiscal pressures due to the decline in oil revenues forces the GCC governments to rationalise their spending and implement step-by-step fiscal and economic reforms, which include removing energy subsidies. Thus, reporting lower earnings may increase the possibility of obtaining political advantage by delaying the phasing out of energy subsidies. Second, managers may decide to push profits downwards to take a “big bath” by reducing earnings in periods of economic slowdown for future periods or to obtain concessions from banks and lenders.

Since RM_PROXY of the MENA region firms is positive, thus it can be concluded that the whole region combined is engaged in income-increasing real earnings management on average. The descriptive statistics of the individual measures of real activities-based earnings management is reported in range from -0.002 to 0.006 in the MENA region firms, where AB_CFO has the largest magnitude among the three individual real earnings management proxies. The mean of AB_PROD and AB_DISEXP is zero and below zero, respectively, therefore it can be concluded that the MENA region firms do not engage aggressively in overproduction strategy or reducing discretionary expenditure to manage earnings upward. It can be seen that the firms of the MENA region country perform upward real earnings management mainly through AB_CFO.

The descriptive analysis signals considerable variability over the sample period in the GCC and non-GCC country firms. However, the non-GCC country firms exhibit higher variability as evidenced by the higher standard deviation of most of its variables compared with those of the GCC country firms. In conclusion, descriptive analysis indicates higher mean values and standard deviation in the non-GCC country firms compared with their counterparts in the GCC countries. This may be attributable to the smaller sample of 878 observations of the non-GCC country firms compared to 1,482 observations of the GCC country firms. Prior to conducting the multivariate regression analysis, Pearson correlations among the variables used in the regression analysis of this chapter are examined in the next section.

6.3 Correlation Analysis

Table 6.3 presents the Pearson Correlation Matrix of the variables along with their significance levels. Table 6.3 shows that $ABSE_{EARN}$ is positively and significantly correlated with DIS_ACC and $Innate\_ACC$ at the 1% level. This is expected since ACC are embedded in $EARN$ which are merely an aggregation of the CFO and ACC. Interestingly, $ABSE_{CFO}$ is also positively and significantly correlated with DIS_ACC and $Innate\_ACC$ at the 1% level. The significant correlation between $ABSE_{CFO}$ and both DIS_ACC and $Innate\_ACC$ is not expected, because both variables measure the quality of the accrual component of earnings, not the cash flow component of earnings. However, this significant correlation may be attributable to the significant similarities between the performance of $EARN$ prediction model and CFO prediction model as found in Chapter 5.

Further, since correlation does not measure the causal relationship between the variables, multivariate regression is performed to provide further investigation on the relationship between $ABSE_{CFO}$ and abnormal accruals either by intentional (DIS_ACC) or unintentional ($Innate\_ACC$) errors. Thus, the significant correlation between the absolute cash flow prediction errors and abnormal accruals raises the possibility that both types of abnormal accruals are reducing the abilities of $EARN$ and CFO in predicting the one-year-ahead CFO.

Table 6.3 shows that there is a significant negative association between ACC_CONT and DIS_ACC at the 1% level. This shows that the greater the magnitude of discretionary accruals, the lower the contribution of total ACC in predicting the one-year-ahead CFO, supporting the research hypothesis. However, there is insignificant correlation between ACC_CONT and $Innate\_ACC$. Although, this insignificant relationship is not consistent with the hypothesis, the correlation results just provide a preliminary test of the hypotheses and thus the regression analysis is needed to determine whether or not the hypothesis is supported. Overall, these findings present preliminary evidence of an inverse relationship between DIS_ACC and the predictive abilities of $EARN$, CFO and ACC, and inverse relationship between $Innate\_ACC$ and the predictive abilities of $EARN$ and CFO.

Table 6.3: Pearson Correlation Matrix for the Variables of Cash Flow Prediction Errors, Accruals Contribution, Earnings Management and Unintentional Managerial Errors

Variables	$ABSE_{EARN}$	$ABSE_{CFO}$	ACC_CONT	DIS_ACC	$SIZE$	σCFO	$\sigma SALES$	$OperCycle$	$NegEARN$	$Innate\_ACC$	AB_CFO	AB_PROD	AB_DISEXP
$ABSE_{CFO}$	0.779***												
ACC_CONT	-0.239***	0.258***											
DIS_ACC	0.145***	0.060***	-0.104***										
$SIZE$	-0.142***	-0.157***	-0.018	0.027									
σCFO	0.340***	0.430***	0.032	-0.015	-0.209***								
$\sigma SALES$	0.195***	0.222***	0.003	-0.008	-0.151***	0.332***							
$OperCycle$	0.149***	0.132***	-0.080***	-0.010	-0.028	0.129***	-0.057***						
$NegEARN$	-0.018	0.040**	0.084***	-0.019***	-0.161***	0.013	0.017	0.082***					
$Innate\_ACC$	0.221***	0.225***	0.005	-0.123	-0.221***	0.343***	0.264***	0.168***	0.285***				
AB_CFO	0.228***	0.209***	-0.122***	0.008	-0.080***	0.190***	0.150***	0.243***	0.239***	0.190***			
AB_PROD	0.049***	0.080***	-0.040**	-0.002	0.058***	0.109***	0.087***	0.162***	0.224***	0.132***	0.544***		
AB_DISEXP	-0.015	0.024	0.032	-0.011	0.079***	0.021	-0.028	0.019	0.010	0.013*	0.034	0.429***	
RM_PROXY	0.132***	0.150***	-0.071***	-0.001	0.014	0.155***	0.111***	0.208***	0.236***	0.165***	0.778***	0.908***	0.524***

This table presents the Pearson Correlation Matrix for the variables of absolute cash flow prediction errors, accruals contribution, earnings management and unintentional managerial errors for the MENA region firms. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Variables definitions: $ABSE_{EARN}$ is the absolute prediction error of $EARN$ model; $ABSE_{CFO}$ is the absolute prediction error of CFO model; ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model, where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$; DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model as modified by Francis *et al*. (2005); $SIZE$ is natural logarithm of total assets; σCFO is the standard deviation of firm's CFO over the past five years; $\sigma SALES$ is the standard deviation of firm's sales over the past five years; $OperCycle$ is the natural logarithm of firm's operating cycle, where $OperCycle = 360(\frac{\Delta \text{A/R}}{\text{SALES}}) + 360(\frac{\Delta \text{INV}}{\text{COGS}})$; $NegEARN$ is the number of years out of the past five years, where firm reported $EARN$ < zero; $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the modified Dechow and Dichev (2002) model, where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$; AB_CFO refers to abnormal CFO scaled by lagged total assets; AB_PROD refers to abnormal production costs scaled by lagged total assets; AB_DISEXP refers to abnormal discretionary expenditures scaled by lagged total assets; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. All variables are trimmed at the 1 percent and 99 percent levels. The sample used in this chapter contains 2360 observations over 2008–2017.

The absolute cash flow prediction errors of $EARN$ and CFO are significantly correlated with most of the determinants of the $Innate\_ACC$. As expected in the research hypotheses, the $ABSE_{EARN}$ and $ABSE_{CFO}$ are negatively associated with $SIZE$, while positively correlated with the σCFO, $\sigma SALES$, and $OperCycle$. The $ABSE_{CFO}$ is positively correlated with $NegEARN$, but surprisingly no specific correlation is found between $ABSE_{EARN}$ and $NegEARN$. Therefore, the significant correlation between the absolute cash flow prediction errors ($ABSE_{EARN}$ and $ABSE_{CFO}$) and these firm-specific characteristics raises the possibility that the predictive abilities of $EARN$ and CFO are not limited to the effect of DIS_ACC, but also the $Innate\_ACC$ and its determinants should be considered. Moreover, ACC_CONT has significant correlation with $OperCycle$ and $NegEARN$ at the 1% level, while other variables have insignificant correlation with ACC_CONT. This indicates that the predictive ability of ACC is not affected by the $Innate\_ACC$ and its determinants as much as the predictive abilities of $EARN$ and CFO.

Turning to the real earnings management proxies, AB_CFO and AB_PROD are positively and significantly correlated with both $ABSE_{EARN}$ and $ABSE_{CFO}$ at conventional levels, consistent with the expectations in research hypotheses. This suggests that firms with a higher level of sales manipulation and overproduction strategy are likely to have more errors when predicting the one-year-ahead CFO using either current $EARN$ or current CFO as predictors. However, AB_DISEXP does not seem to have a significant impact on either $ABSE_{EARN}$ or even $ABSE_{CFO}$. This indicates that the predictive ability of $EARN$ or CFO is not affected by the unusual reduction in discretionary expenditures. Therefore, the predictive abilities of $EARN$ and CFO seem to be affected by only two measures of the real earnings management which are AB_CFO and AB_PROD.

A negative significant correlation between ACC_CONT and the two individual measures of real earnings management (AB_CFO and AB_PROD) indicates that ACC contribution in predicting the one-year-ahead CFO is declining as the abnormal CFO and abnormal production costs increase. This, in turn, provides a preliminary support for the research hypotheses. However, there is insignificant correlation between ACC_CONT and AB_DISEXP. Taken together the insignificant correlation between the absolute cash flow prediction errors ($ABSE_{EARN}$ and $ABSE_{CFO}$) and AB_DISEXP , it seems that AB_DISEXP does not have an effect on the predictive abilities of the $EARN$, CFO, or ACC.

Furthermore, there are positive and significant correlations between the three individual measures of real earnings management at reasonable levels. Thus, it appears that many firms simultaneously engage in the three types of real earnings management, which may explain the strong positive correlation between them.

Based on aggregate measure, the RM_PROXY is significantly correlated with the $ABSE_{EARN}$, $ABSE_{CFO}$ and ACC_CONT at the 1% level. As expected, RM_PROXY is positively correlated with the $ABSE_{EARN}$, $ABSE_{CFO}$, while negatively correlated with ACC_CONT. These significant correlations suggest that, overall, the predictive abilities of $EARN, CFO$ and ACC are correlated with greater levels of real earnings management. Further, there is insignificant relationship between DIS_ACC and RM_PROXY, suggesting that these two earnings management techniques are not used as substitutes or even complementary to each other.

Finally, Table 6.3 shows that all the correlation coefficients between the independent variables are low (less than 0.60). Therefore, it is not expected to have a severe multicollinearity problem. According to Gujarati (2004), multicollinearity problem exists when correlation coefficient between independent variables are more than 0.80. Nevertheless, in addition to estimating pair-wise correlation between independent variables, to tackle the issue of multicollinearity, this thesis also takes into consideration the VIF. After running the regression, any model with VIF larger than the threshold of 10 is considered a signal for high multicollinearity.

In conclusion, these preliminary results based on Pearson correlation are in line with the expectations that the predictive abilities of $EARN$, CFO and ACC are affected by discretionary accruals, real earnings management and unintentional managerial errors. However, these are merely univariate associations and thus multivariate regression analyses should be conducted for further inferences and to investigate the research hypotheses.

6.4 Regression Analysis

The data used in the thesis is panel data which includes both cross-sectional and time series dimensions. Therefore, Hausman (1987) test is used to detect which panel data estimator is more appropriate for each regression model either the FEM or the REM. The use of the panel data technique overcomes, at least partially, the significant limitation of the PRM, where both intercepts and slope coefficients are constant across all the firms. The result of the Hausman test, which analyses whether the random effects are uncorrelated with the explanatory variables, is strongly rejected, which implies that the FEM is more appropriate for all the regression models used in this chapter.

Moreover, White (1980) robust standard errors are applied on all the regression models in this chapter to control for the possible heteroscedasticity problems and autocorrelation in residuals. With respect to possible multicollinearity, the analysis of the VIF indicates that all regression models are not suffering from econometric problems associated with multicollinearity. In the next subsections, the three dependent variables ($ABSE_{EARN}$, $ABSE_{CFO}$ and ACC_CONT) are regressed against (i) discretionary accruals and unintentional managerial errors; (ii) discretionary accruals and firm-specific characteristics; and (iii) real earnings management.

6.4.1 Discretionary Accruals and Unintentional Managerial Errors

This section comprehensively assesses to what extent the discretionary accruals and unintentional managerial errors can influence the abilities of $EARN$ and ACC in predicting the one-year-ahead CFO for the MENA region firms. It is expected that the predictive abilities of $EARN$ and ACC are negatively affected by intentional misuse of accounting discretion to manipulate earnings and unintentional errors in estimating accruals that arise from management lapses and environmental uncertainty. This issue has not yet been fully understood in context of developing countries with an environment of weak investor protection and uncertain operating environment. This is, in turn, considered one of the main contributions of this thesis.

Table 6.4 reports regression results where the independent variables in the all models are discretionary accruals (DIS_ACC) and unintentional managerial errors ($Innate\_ACC$). However, the dependent variable in the first column is the $ABSE_{EARN}$ (Model 1a), while the dependent variable in the second column is ACC_CONT (Model 2a). Pearson Correlation Matrix raises concerns about the significant correlation between $ABSE_{CFO}$ and the two individual measures of the abnormal accruals, DIS_ACC and $Innate\_ACC$. To empirically investigate this unexpected significant correlation, an additional regression model is examined by adding $ABSE_{CFO}$ as a third dependent variable in Table 6.4 (Model 3a). Table 6.4 also shows results of Hausman's tests, F-tests of overall significance, the VIF and F-tests of whether the coefficients of the independent variables are equal to identify which variable has a stronger effect on the dependent variable for the MENA region firms.

The results of the F-statistics reported in Table 6.4 shows that the three models are statistically significant at the 1% level. In the first column of Table 6.4, DIS_ACC and $Innate\_ACC$ are found to be significantly positively associated with $ABSE_{EARN}$ and explain 0.28 of its variation. The coefficient on DIS_ACC is significant and positive at the 1% level. This shows that the greater the magnitude of discretionary accruals, the lower the ability of $EARN$ to predict the one-year-ahead CFO. Hence, it appears that discretionary accruals, as estimated through the modified Dechow and Dichev (2002) model, have a negative impact on the predictive ability of $EARN$. To the extent that the measure of discretionary accruals captures managerial discretion in financial reporting, the opportunistic view of discretionary accruals appears to dominate the efficient view in the MENA region firms.

These results are inconsistent with the findings of Subramanyam (1996), Al-Attar *et al*. (2008) and Farshadfar and Monem (2011). They find that that discretionary accruals enhance the ability of $EARN$ to predict the one-year-ahead CFO. Their studies support the view that managerial discretion improves, rather than distorts, the relevance of earnings to accounting users in the US, UK and Australian capital market setting, respectively. They highlight that although the flexibility provided by the accounting standards allows manager to use their discretion in financial reporting for opportunistic purposes; this discretion improves the usefulness of earnings as it allows managers to disclose their private information on the expected future cash flows.

Therefore, it is obvious that managers of the MENA region firms, in contrast to the US, UK and Australian firms, are likely to use accruals opportunistically to window-dress by showing that their firms are more profitable than they really are and thus mislead the users of financial statements rather than exercising efficiently their discretion over accruals to convey their private information. The managers in this region have the opportunity to do this due to the weak law enforcement and investor protection environment, high corruption, lack of effective corporate governance, and weak auditing systems that are embedded in the developing countries (Looney, 2005; Gill *et al.*, 2013; Kuo *et al*., 2014).

Consistent with the above argument, Leuz *et al.* (2003) find that earnings management decreases in countries with stronger investor protection. Further, Memis and Cetenak (2012) find that the efficient legal systems which protect stakeholders' right helps to decrease earnings management incentives. To sum up, the results of this section highlight the importance of enacting new rules and regulations in the MENA region in order to prevent managers from misusing their discretion in financial reporting for opportunistic purposes through exploiting the absence of a strong legal environment.

Table 6.4: The Effect of Discretionary Accruals and Unintentional Managerial Errors on the Predictive Ability of Earnings and its Components in the MENA Region Firms

	Model 1a $ABSE_{t,EARN}$			Model 2a ACC_CONT_t			Model 3a $ABSE_{t,CFO}$		
Hausman Test	29.72***			7.28**			32.42***		
Adjusted R-squared	0.28			0.07			0.26		
F-statistics	14.78***			5.61***			6.99***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.219***	3.39	+	-0.076***	-3.11	-	0.077	1.22	+
$Innate\_ACC_{t-1}$	0.481***	5.06	+	-0.068*	-1.69	-	0.365***	3.74	+
Constant	0.044***	16.96		0.004***	3.34		0.046***	17.34	
Maximum VIF	1.02								
Mean VIF	1.02								
Number of Observations	2,360								

F-test of Coefficient Equality: Null Hypothesis	F-statistics	p-value
Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ in Model 1a	7.17***	0.008
Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ in Model 2a	0.03	0.861

This table presents regression results of three regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; and unintentional managerial errors ($Innate\_ACC$) which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the modified Dechow and Dichev (2002) model, where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Therefore, the findings of this thesis differ from those studies conducted on developed countries. Developed country firms may find it difficult to increase the use of opportunistic discretionary accruals as they are constrained by an environment of strong investor protection (DeFond and Hung, 2007; Kuo *et al*., 2014). Thus, the managerial discretion in accruals in these countries usually convey useful information to financial statement users which facilitate the process of predicting future cash flows, while this is not the case in the developing countries. Therefore, some degree of caution is necessary when generalizing the results of this thesis to firms with characteristics that differ significantly from those used in this thesis.

Table 6.4 shows a significant and positive relationship at the 1% level between the $ABSE_{EARN}$ and $Innate\_ACC$. Therefore, the positive significant coefficient on $Innate\_ACC$ suggests that not only the discretionary accruals that can negatively affect the predictive ability of $EARN$ but also the unintentional managerial errors in estimating accruals. Since, the predictive ability of $EARN$ is attributable to accruals, thus, any unintentional change in the properties of accruals due to environmental uncertainty and operational volatility alter the predictive ability of $EARN$. The inferences that can be drawn from these results is that the surrounding operating and environmental factors where the firm operates, which are represented by firm size, volatility of CFO, volatility of sales, operating cycle length, and frequency of reporting negative $EARN$, can explain a significant portion of $EARN$'s ability to predict future cash flows.

Surprisingly, the coefficient on $Innate\_ACC$ is about two times larger than the coefficient on DIS_ACC (a coefficient of 0.481 versus a coefficient of 0.219). F-test of coefficient equality strongly rejects the null that the coefficients on DIS_ACC and $Innate\_ACC$ are equal (F-statistic = 7.17). This implies that the unintentional managerial errors have stronger effect than discretionary accruals on the predictive ability of $EARN$.

It is worth mentioning that no research, to date, examines how portioning abnormal accruals into two components to reflect unintentional managerial errors ($Innate\_ACC$) and managerial reporting choices (DIS_ACC), affects $EARN$'s predictive ability. Existing studies focus mainly on the effect of discretionary accruals ignoring the effect of unintentional managerial errors on the cash flow prediction process. Therefore, the uniqueness of this thesis lies in the fact that no extant research examines the effect of these two types of abnormal accruals on the predictive ability of $EARN$ and its components for developing countries. The MENA region provides an interesting setting to analyse the impact of both types of abnormal accruals on the cash flow prediction process because it is characterized by the lack of managerial skills and high levels of managerial opportunism.

In the second column of Table 6.4, DIS_ACC and $Innate\_ACC$ are significantly negatively associated with ACC_CONT at the 1% and only 10% levels, respectively. Thus, this indicates that DIS_ACC and $Innate\_ACC$ leads to lower the contribution of ACC upon current CFO alone in predicting the one-year-ahead CFO. Table 6.4 shows that DIS_ACC and $Innate\_ACC$ explain a relatively small proportion of the variation in ACC_CONT, which is equal to 0.07. With respect to the discretionary component of accruals, the results suggest that the higher usage of managers' discretion in the accrual accounting process, the lower the contribution of total ACC upon current CFO alone in predicting the one-year-ahead CFO, consistent with Nam *et al*. (2012). Hence, the negative association between DIS_ACC and ACC_CONT confirms the previous results that managerial discretion in accrual estimation has opportunistic reporting incentives rather than informative in the firms of the MENA region. Therefore, it can be concluded that managers in the MENA region are regarded as more likely opportunistic manipulators.

However, Table 6.4 shows that both the DIS_ACC and $Innate\_ACC$ have a significant impact on the ACC contribution in predicting the one-year-ahead CFO; it seems that the former has the greater effect. The effect of $Innate\_ACC$ on ACC_CONT is smaller in magnitude and weaker in statistical significance compared to DIS_ACC. However, the F-test of coefficient equality accepts the null that the coefficients on DIS_ACC and $Innate\_ACC$ are equal. Therefore, both have the same effect on ACC_CONT. Collectively, the results reported in Table 6.4 support Hypothesis 5 that discretionary accruals and unintentional managerial errors decrease the predictive abilities of $EARN$ and ACC.

The analysis in the third column of Table 6.4 shows that there is a significant relation between $ABSE_{CFO}$ and $Innate\_ACC$, but the relation between $ABSE_{CFO}$ and DIS_ACC is statistically insignificant. Although the CFO does not include ACC as one of its components, the results of the Pearson Correlation Matrix in Section 6.3 show that $ABSE_{CFO}$ is significantly correlated with both abnormal accrual measures, DIS_ACC and $Innate\_ACC$. However, the regression results contradict the results of the correlation analysis and it proves that the association between the discretionary component of accruals and the predictive ability of the CFO is insignificant. However, the results in Table 6.4 show that there is a significant relation between the innate component of accruals and the predictive ability of the CFO. Specifically, the results show that higher unintentional managerial errors in estimating accruals are associated with lower predictive ability of the CFO.

These results might be attributed to the fact that the determinants of $Innate\_ACC$ such as firm size, CFO volatility, sales volatility, operating cycle length and frequency of reporting losses are also related to the ability of CFO to predict future cash flows. Apparently, unintentional managerial errors in estimating accruals reflect the accounting state of the firms, the operational volatility and environmental uncertainty. All of these conditions affect also the predictive ability of CFO not only ACC. Thus, when unintentional managerial errors are low, the CFO is persistent and relevant for predicting future cash flows.

To sum up, the predictive abilities of $EARN$, CFO and ACC are decreased by the general increase in unintentional managerial errors, while the predictive abilities of $EARN$ and ACC are reduced by increasing the manipulation of earnings via discretionary accruals. Given these findings, it is apparent that firms that suffer from poor accruals quality that is driven by innate features of the business environment can face some difficulties in using $EARN$, CFO and ACC as predictors of the future cash flow, while firms that suffer from poor accruals quality that is driven by discretionary accruals can be advised to use the CFO as a predictor of the future cash flows as CFO does not suffer from the intentional misuse of accounting discretion to manipulate earnings.

In conclusion, the results of this section provide a significant contribution to the literature of cash flow prediction on two perspectives. First, the distinction between intentional and unintentional managerial errors is important because much of the literature to date assumes that the predictive abilities of $EARN$ and ACC are only affected by management intent to manipulate, while such intent is unobservable and happens occasionally (e.g., before stock offerings) (Dechow and Dichev, 2002). In contrast, the results of this thesis reveal that even in the absence of managerial discretion in accruals, the predictive ability of $EARN$ and its components are likely to be related to observable and recurring firm-specific characteristics like firm size, CFO volatility, sales volatility, operating cycle length and frequency of reporting losses. All of these firm characteristics jointly are associated with higher incidence of unavoidable and inaccurate estimation errors in earnings, which, in turn, affects the ability of $EARN$ and its components when predicting future cash flows.

Second, Francis *et al*. (2005) find that their developed measure of $Innate\_ACC$ explain a significant portion of accruals quality, this thesis contributes to the literature by finding that this measure explain also a significant portion of the variation in the predictive ability of $EARN$ and its components. Specifically, the results show that $Innate\_ACC$ has a significant impact on the CFO which runs counter to the expectations that unintentional managerial errors in estimating accruals have an impact only on $EARN$ and ACC.

Consequently, to provide further evidence on $Innate\_ACC$ given its significant impact on the predictive ability of $EARN$ and its components, the determinants of the $Innate\_ACC$, rather than the total $Innate\_ACC$, are added to the models as right-hand side variables in the next section along with DIS_ACC to examine the impact of each of these variables on the predictive abilities of $EARN$, CFO and ACC.

6.4.2 Discretionary Accruals and Firm-Specific Characteristics

This thesis extends the analysis by performing additional analysis to provide preliminary information regarding whether any firm-specific characteristics suggested by Dechow and Dichev (2002) and Francis *et al*. (2005) as innate components of accruals quality might help explain the variability in prediction performance of $EARN$ and its components.

Dechow and Dichev (2002) and Francis *et al*. (2005) find that smaller firms, and firms with greater cash flow volatility, greater sales volatility, longer operating cycles, and a greater incidence of losses tend to have poorer accruals quality. Therefore, it is expected that as long as these variables affect the quality of accruals, they might affect the predictive ability of $EARN$ and its components. Further, the extant literature provides little evidence about the consequences of these firm-specific characteristics on the performance of cash flow prediction models.

Therefore, this section provides further analysis by examining the unique impact of each component of the determinants of the $Innate\_ACC$ as suggested by Dechow and Dichev (2002) and Francis *et al*. (2005) on the predictive ability of $EARN$ and its components. This happens by replacing the single indicator variable of the innate component of accruals in Table 6.4 with the determinants of $Innate\_ACC$ which are proxied by five firm-specific characteristics ($SIZE$, σCFO, $\sigma SALES$, $OperCycle$ and $NegEARN$) in Table 6.5.

Table 6.5 presents the results of the three regression models examining the impact of discretionary accruals and five firm-specific characteristics on $ABSE_{EARN}$(Model 1b), ACC_CONT (Model 2b) and $ABSE_{CFO}$(Model 3b). To have a more parsimonious model, DIS_ACC is removed in Model 3b due to its insignificance effect on the $ABSE_{CFO}$. However, to ensure that excluding DIS_ACC from Model 3b does not affect the results, the tests are repeated with having DIS_ACC as one of the variables, but no significant change in the result is noticed. Thus, this section reports only the results in which DIS_ACC is excluded. Table 6.5 shows that the coefficients on the DIS_ACC generally exhibit the same sign and significance level as in Model 1a, while it has the same sign yet lower significance level compared to Model 2a. Therefore, this confirms the previous results of Table 6.4 that DIS_ACC has a significant negative effect on the predictive abilities of $EARN$ and ACC.

With respect to firm size, the results show that $SIZE$ does not seem to have a significant impact on either $ABSE_{EARN}$ or $ABSE_{CFO}$. These results are consistent with Kim and Kross (2005), whilst Habib (2010) and Lorek and Willinger (2009; 2010) find that current $EARN$ and CFO of larger firms are more stable and lead to more accurate cash flow predictions than those of smaller firms in Australia and the US, respectively. Moreover, $SIZE$ has also insignificant relation with the ACC_CONT. This result is inconsistent with Nam *et al*. (2012) and Arnedo *et al*. (2012). Nam *et al*. find that ACC contribute more in enhancing cash flow predictions for small-sized firms, while Arnedo *et al*. find that large firms provide ACC greater predictive ability than those of smaller firms.

Therefore, this finding does not support the generalization that cash flow predictions of larger firms are more accurate than those of smaller firms. These results may be attributed to the fact that firms in the MENA region regardless of their size operate in an uncertain environment since the chosen countries in the sample are developing countries which normally face many economical, political and social challenges. Thus, the expected streams of cash flows are more likely to be uncertain and exhibit greater volatility. As a result, the large amount of noise contained in cash flows makes it difficult to predict accurate future cash flow series for small or even large firms. Consequently, Hypothesis 8 which expects that firm size has positive impact on the predictive ability of $EARN$ and components is rejected.

Table 6.5: The Effect of Discretionary Accruals and Firm-Specific Characteristics on the Predictive ability of Earnings and its Components in the MENA Region Firms

	Model 1b $ABSE_{t,EARN}$			Model 2b ACC_CONT_t			Model 3b $ABSE_{t,CFO}$		
Hausman Test	36.79***			16.72***			35.88***		
Adjusted R-squared	0.31			0.08			0.30		
F-statistics	15.03***			3.66***			12.93***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.204***	3.360	+	-0.071**	-2.290	-			
$SIZE_{t-1}$	0.001	0.080	-	-0.003	-0.620	+	-0.003	-0.31	-
σCFO_{t-1}	0.273***	5.120	+	-0.027	-1.340	-	0.345***	6.36	+
$\sigma SALES_{t-1}$	-0.009	-0.320	+	-0.003	-0.200	-	-0.021	-0.73	+
$OperCycle_{t-1}$	0.007***	6.280	+	-0.001***	-3.170	-	0.005***	4.84	+
$NegEARN_{t-1}$	-0.001	-0.120	+	0.010**	2.010	-	0.009	0.9	+
Constant	0.015	0.270		0.025	0.880		0.035	0.67	
Maximum VIF	1.19								
Mean VIF	1.08								
Number of Observations	2,360								

This table presents regression results of three regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; $SIZE$ is natural logarithm of total assets; $\sigma CFO$is the standard deviation of firm's CFO over the past five years; $\sigma SALES$ is the standard deviation of firm's sales over the past five years; $OperCycle$ is the natural logarithm of firm's operating cycle, where $OperCycle = 360(\frac{\Delta\ \text{A/R}}{\text{SALES}}) + 360(\frac{\Delta\ \text{INV}}{\text{COGS}})$; $NegEARN$ is the number of years out of the past five years, where firm reported $EARN$ < zero. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Concerning the volatility of CFO, the coefficient on σCFO is significantly positive at the 1% level in Models 1b and 3b. This suggests that the more volatile cash flows is, the poorer the abilities of $EARN$ and CFO to predict the one-year-ahead CFO, consistent with Habib (2010). Therefore, the ability of either $EARN$ or CFO to predict the one-year-ahead CFO is difficult for companies exhibiting volatile cash flows, because such cash flows is less persistent and less predictable, supporting Hypothesis 9.

In contrast to $ABSE_{EARN}$ and $ABSE_{CFO}$, the coefficient on σCFO is no longer significant in Model 2b. Inconsistent with Hypothesis 10 which expects a positive relation between the predictive ability of ACC and the volatility of CFO, it is found that there is insignificant relationship between ACC_CONT and σCFO. Therefore, this result does not support the argument and finding of Nam *et al.* (2012) that ACC tend to smooth out some of the volatility in the cash flow patterns by mitigating issues arising from timing and mismatching problems inherent in the cash flows.

As predicted in the research hypotheses, the coefficient on $OperCycle$ is found to be significantly positively associated with the $ABSE_{EARN}$ and $ABSE_{CFO}$ at the 1% level. Since operating cycle length captures how quickly the firms collect cash from debtors and making use of inventory, thus it is found that longer this cycle the higher cash flow prediction errors. This result is consistent with the findings of prior studies (e.g., Barth *et al*., 2001; Lorek and Willinger, 2009; Habib, 2010). Specifically, this result supports the argument that firms with longer operating cycle length inherently present high cash flow prediction error because longer operating cycles indicate more uncertainty, more unintentional managerial errors, and thus lower the predictive abilities of $EARN$ and CFO.

Further, it is found that $OperCycle$ has negative effect on ACC_CONT. Therefore, the longer operating cycle, the lower the incremental contribution of ACC to the prediction of one-year-ahead CFO. This result might be due to argument that firms with longer operating cycles are expected to have greater flexibility for earnings manipulation since these firms have greater magnitude of accruals and a longer period for these accruals to reverse (Dechow, 1994; Zang, 2012), which in turn affects the performance of ACC to predict the one-year-ahead CFO. Therefore, the firm's operating cycle proves to have a significantly negative impact on the predictive abilities of $EARN$, CFO and ACC, supporting Hypothesis 12.

Finally, the results reveal that $ABSE_{EARN}$ and $ABSE_{CFO}$ are not associated with $\sigma SALES$ or $NegEARN$. However, Francis *et al*. (2005) find that more volatile sales and the greater frequency of reporting negative $EARN$ leads to higher estimation errors in accruals which negatively affect the quality of earnings. Accordingly, it is expected that these two variables are negatively associated with the predictive ability of $EARN$ and its components. In contrast to the expectations outlined in Hypotheses 11 and 13, both variables prove to have no effect on the predictive abilities of $EARN$ or CFO. Moreover, Table 6.5 shows that even ACC_CONT has insignificant relationship with $\sigma SALES$, inconsistent with Yoder (2007) who finds that the predictive ability of ACC decreases as sales volatility increases. The insignificant effect of sales volatility is probably attributable to the lower sales volatility. As noted in the descriptive statistics in Section 6.2, the sales volatility reported for the MENA region firms, on average, is lower than that reported by Francis *et al*. (2005) for the US firms.

In contrast to $ABSE_{EARN}$ and $ABSE_{CFO}$, the coefficient on $NegEARN$ becomes significant at the 5% level in Model 2b. Table 6.5 indicate that $NegEARN$ is significantly positively associated with ACC_CONT. This means that as the frequency of reporting negative $EARN$ increases, the ACC contribution in predicting one-year-ahead CFO increases compared to the current CFO alone. These results imply that for companies that report negative $EARN$, ACC may have a role in predicting future cash flows which support the argument of Yoder (2007) that ACC contains information about future cash flows beyond their simple mechanical reversal of current receivables and payables. Although there is significant positive relationship between ACC_CONT and $NegEARN$, this result still contradicts the Hypothesis 13 that the frequency of reporting negative $EARN$ may jeopardise the predictive ability of $EARN$ and its components.

Given the previous results, it is obvious that ACC contain significant information for future cash flows, over and above that contained in the current CFO and aggregate $EARN$ data. This might be a reason why the cash flow prediction model that contains both the CFO and total ACC provides the lowest prediction error among all the other prediction models as found in Chapter 5.

To sum up, when the single $Innate\_ACC$ is replaced with its five determinants, the reported results strongly suggest that the predictive ability of $EARN$ and its components are noticeably higher when the operating cycle length is short. Further, the prediction performance of $EARN$ and CFO are low for firms characterised by high cash flow volatility, while the incremental contribution of ACC over the current CFO in improving the prediction of one-year-ahead CFO is high for firms with a higher incidence of negative $EARN$ realizations.

In conclusion, the results of this section highlight that the predictive ability of $EARN$ and its components is a function of certain firm-specific characteristics which are the volatility of cash flows, operating cycle length and frequency of reporting negative $EARN$. These findings, therefore, contribute to the growing body of empirical work that suggests that the predictive ability of $EARN$ and its components is subject to firm-specific characteristics. However, there are potentially many other factors that could affect the prediction of future cash flows, but the exploration of these factors are left for future research.

6.4.3 Real Earnings Management

Existing studies document the significant effect of discretionary accruals on the performance of cash flow prediction models (e.g., Subramanyam, 1996; Al-Attar *et al*., 2008; Farshadfar and Monem, 2011; Nam *et al*., 2012). However, a significant amount of work has started to focus on how earnings management can be achieved through various forms other than discretionary accruals. Earnings management can be done through managers' discretion and judgment regarding accounting choices with no direct cash flow implications or by altering real activities with direct effect on cash flows. Although, earnings management through real activities not only affects accruals, but also cash flows (Roychowdhury, 2006), few studies to date investigate the possibility that managements' attempt to manipulate earnings by altering operating activities could constraint the process of predicting future cash flows. Therefore, this thesis provides further investigation by analyzing whether or not manipulating operating activities through real earnings management has significant negative consequences on the predictive ability of $EARN$ and its components.

Table 6.6 presents the regression results for the three models that examine the effect of real earnings management on the predictive abilities of $EARN$, ACC and CFO in Models 1c, 2c and 3c, respectively. To obtain a better understanding of the effect of real earnings management on the cash flow prediction accuracy, the regression models are estimated after controlling for the discretionary accruals and unintentional managerial errors in Models 1c and 2c, and unintentional managerial errors only in Model 3c.

The findings in Table 6.6 are consistent with the hypotheses that expect that discretionary accruals, unintentional managerial errors and real earnings management negatively affect the abilities of $EARN$, CFO and ACC in predicting the one-year-ahead CFO. In the three regression models of Table 6.6, the coefficients of the DIS_ACC (in Models 1c and 2c), $Innate\_ACC$ and RM_PROXY have the predicted signs and are significant at conventional levels. Moreover, the coefficient of DIS_ACC and $Innate\_ACC$ have the same signs and significance level as the regression models in Table 6.4. This provides further support to the consistency of the research results. Even after including RM_PROXY to test real earnings management, $Innate\_ACC$ remains to have significant relation with $ABSE_{EARN}$, $ABSE_{CFO}$ and ACC_CONT , and DIS_ACC still have significant relation with $ABSE_{EARN}$ and ACC_CONT.

Focusing on the real earnings management, RM_PROXY is significantly associated with the $ABSE_{EARN}$, $ABSE_{CFO}$ and ACC_CONT at the 1% level. The RM_PROXY is found to have positive relation with $ABSE_{EARN}$ and $ABSE_{CFO}$, while to have a negative relation with

ACC_CONT. As expected in Hypothesis 6, it is found that the higher real activities manipulation lead to reduction in the ability of $EARN$ and its components to predict the one-year-ahead CFO. Since, RM_PROXY is the combination of the three real earnings management activities (AB_CFO, AB_PROD and AB_DISEXP), thus the MENA region firms with higher level of real earnings management through sales manipulation, overproduction strategy and/or reduction of discretionary expenditures generate more errors when predicting the one-year-ahead CFO either for the $EARN$ or CFO prediction models. Even the incremental contribution of ACC over the current CFO in predicting the one-year-ahead CFO decreases when the real activities increase.

Consequently, these results suggest that using real earnings management to influence the output of the accounting system is considered as opportunistic activities in the MENA region firms. Such activities deviate from normal business practices, depict a biased picture of firm's economic performance and its earnings level, and thus have negative consequences on the prediction of the future cash flows. These results along with the results of Table 6.4 emphasize that earnings management behaviors, either through discretionary accruals or real activities manipulation, in the firms of the MENA region are opportunistic rather than efficient. Again, this may be a reflection of lack effective corporate governance and weak investor protection in these countries.

Table 6.6: The Effect of Real Earnings Management on the Predictive Ability of Earnings and its Components in the MENA Region Firms

	Model 1c $ABSE_{t,EARN}$			Model 2c ACC_CONT_t			Model 3c $ABSE_{t,CFO}$		
Hausman Test	44.29***			34.92***			21.64***		
Adjusted R-squared	0.31			0.11			0.27		
F-statistics	19.98***			17.57***			10.92***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.225***	3.58	+	-0.078***	-3.25	-	-	-	-
$Innate\_ACC_{t-1}$	0.449***	4.83	+	-0.056*	-2.40	-	0.326***	3.46	+
RM_PROXY_{t-1}	0.069***	5.16	+	-0.027***	-6.42	-	0.041***	3.06	+
Constant	0.045***	17.53		0.004***	3.19		0.047***	17.98	
Maximum VIF	1.04								
Mean VIF	1.03								
Number of Observations	2,360								

F-test of Coefficient Equality: Null Hypothesis	F-statistics	p-value
Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 1c	8.65***	0.000
Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 2c	1.34	0.261
Coefficients on $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 3c	8.90***	0.003

This table presents regression summary statistics of estimation the regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; and unintentional managerial errors ($Innate\_ACC$) which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the modified Dechow and Dichev (2002) model, where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Despite the widespread belief that discretionary accruals is the only earnings management technique that the can affect the process of predicting future cash flows, this thesis provides evidence to validate that real activities manipulation can also affect the predictive ability of $EARN$ and its components. However, by comparing between the impact of discretionary accruals and real activities manipulation on the predictive abilities of $EARN$ and ACC, the results of the F-test in Table 6.6 that tests the equality of the coefficients of both variables reveal that discretionary accruals has more significant negative effect on the predictive ability of $EARN$, but both earnings management techniques have similar impact on the ACC contribution in predicting the one-year ahead CFO. Further, the results of the F-test of coefficient equality show that the coefficient of $Innate\_ACC$ is significantly higher than that of the RM_PROXY and DIS_ACC in Models 1c and 3c, while there are insignificant differences between the three variables in Model 2c.

Therefore, the $Innate\_ACC$ has significantly the largest effect compared to DIS_ACC and RM_PROXY on the predictive abilities of $EARN$ and CFO. This might be due to the occasional occurrence of earnings management. Dechow and Dichev (2002) and Taylor and Xu (2010) argue that earnings management either through discretionary accruals or real earnings management happens occasionally rather than on a regular basis, for example, before stock offerings or to meet analysts' earnings predictions. Consequently, such occasional manipulations may not necessarily cause a significant decline in the predictive abilities of $EARN$ and CFO, while unintentional managerial errors are recurring practices. Even with good skills and the best intentions, managers of firms in volatile industries are likely to make larger accruals estimation errors which affect the predictive abilities of $EARN$ and CFO in such industries.

To sum up, the previous results show that when engaging in either real or accrual-based earnings management, the MENA region firms are more likely to generate more errors when predicting the one-year-ahead CFO. In addition, the results show that unintentional managerial errors have the greatest effect among the two earnings management techniques on the predictive abilities of $EARN$ and CFO, while all of them have the same effect on the predictive ability of ACC. Motivated by the significance effect of the real earnings management techniques on the predictive ability of $EARN$ and its components, this thesis provides further investigations on the relationship between the predictive ability of $EARN$ (and its components) and each type of real earnings management activity. Consequently, the previous models are further examined by using three individual real earnings management proxies, AB_CFO, AB_PROD, and AB_DISEXP instead of aggregate RM_PROXY.

Table 6.7 presents the regression results for the three models that examine the effect of the three individual measure of real earnings management on the predictive abilities of $EARN$, ACC and CFO in Models 1d, 2d and 3d, respectively, after controlling for DIS_ACC and the determinants of $Innate\_ACC$. Therefore, Table 6.7 presents a comprehensive model that retains all the disaggregated variables of earnings management and the determinants of $Innate\_ACC$. Results and inferences of the effect of five firm-specific characteristics and discretionary accruals on the predictive ability of $EARN$ and its components remain consistent with the results obtained in Table 6.5.

Consistent with the expectations, the effect of the AB_CFO on the $ABSE_{EARN}$ and $ABSE_{CFO}$ is positive and significant at the 1% level. Therefore, firms with higher magnitude of abnormal cash flows, as measured by Roychowdhury (2006), have higher errors when predicting the one-year-ahead CFO when using either $EARN$ or CFO as predictors. This indicates that firms which generate additional unsustainable sales through offering price discounts or providing more lenient credit terms to boost sales volumes and meet short-term earnings target have $EARN$ and CFO not in their normal level in a given period which lead to generate more errors when predicting CFO in subsequent periods. Therefore, the results reveal that the predictive abilities of $EARN$ and CFO decreases when the outcome of abnormal CFO turns out to be high.

However, real earnings management via overproduction strategy and reduction of discretionary cost does not have a significant effect on the $ABSE_{EARN}$ and $ABSE_{CFO}$. In contrast, Li (2019) find that the less persistent current $EARN$ as a result of abnormal reduction of discretionary expenditure decrease its ability to predict the $FCFO$. However, as noted in the descriptive statistics, firms in the MENA region, on average, do not aggressively perform real earnings management via abnormal production costs or abnormal discretionary expenditures compared to the abnormal CFO. These two techniques might have effect on the predictive abilities of $EARN$ and CFO in firms that engage more in overproduction to lower the COGS or reducing discretionary expenditures in order to improve reported margins. Thus, it is recommended for future research to conduct further analysis in other regions and preferably developed countries where firms face greater scrutiny that force them to switch from accruals earnings management to real earnings management, which is less detectable.

Table 6.7: Comprehensive Models for the MENA Region Firms

	Model 1d $ABSE_{t,EARN}$			Model 2d ACC_CONT_t			Model 3d $ABSE_{t,CFO}$		
Hausman Test	56.27***			31.01***			42.44***		
Adjusted R-squared	0.35			0.10			0.32		
F-statistics	13.80***			5.34***			11.34***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.210***	3.60	+	-0.074***	-2.43	-			+
$SIZE_{t-1}$	-0.006	-0.57	-	0.001	0.15	+	-0.005	-0.52	-
σCFO_{t-1}	0.234***	4.69	+	-0.017	-0.85	-	0.318***	6.11	+
$\sigma SAlES_{t-1}$	-0.009	-0.29	+	-0.003	-0.19	-	-0.019	-0.69	+
$OperCycle_{t-1}$	0.005***	4.67	+	-0.001*	-1.77	-	0.004***	3.80	+
$NegEARN_{t-1}$	-0.010	-1.18	+	0.013***	2.64	-	0.004	0.45	+
AB_CFO	0.150***	5.75	+	-0.040***	-4.40	-	0.109***	4.10	+
AB_PROD	-0.001	-0.07	+	-0.021**	-2.07	-	-0.031	-1.38	+
AB_DISEXP	-0.035	-1.00	+	0.001	0.05	-	-0.025	-0.70	+
Constant	0.059	1.06		0.001	0.02		0.051	0.96	
Maximum VIF	1.90								
Mean VIF	1.28								
Number of Observations	2,360								

This table presents regression results of three regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; $SIZE$ is natural logarithm of total assets; $\sigma CFO$is the standard deviation of firm's CFO over the past five years; $\sigma SALES$ is the standard deviation of firm's sales over the past five years; $OperCycle$ is the natural logarithm of firm's operating cycle, where $OperCycle = 360(\frac{\Delta\ A/R}{SALES}) + 360(\frac{\Delta\ INV}{COGS})$; $NegEARN$ is the number of years out of the past five years, where firm reported $EARN$ < zero; AB_CFO refers to abnormal CFO scaled by lagged total assets; AB_PROD refers to abnormal production costs scaled by lagged total assets; AB_DISEXP refers to abnormal discretionary expenditures scaled by lagged total assets. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

The coefficients on the AB_CFO and AB_PROD are negative and statistically significant at the 1% and 5% levels in Model 2d, respectively. This suggests that the ACC contribution upon the current CFO in predicting the one-year-ahead CFO decreases in firms that attempt to engage in sales manipulation and overproduction strategy. The overproduction strategy affects the predictive ability of ACC rather than $EARN$ and CFO. Thus, the overproduction strategy seems to have a greater effect on ACC because the firms that apply this strategy have higher inventories than normal at the year-end. Thus, an increase in the inventory levels towards the year-end increase total ACC above what is normal. This, in turn, leads to errors in predicting future cash flows especially for models that include the current CFO along with total ACC. However, the results related to AB_PROD cannot be generalized and need to be interpreted cautiously as despite the high value of the adjusted R-squared as found in the descriptive statistics in Section 6.2, the estimates of its coefficients are not consistent with the theoretical arguments and findings of Roychowdhury (2006).

In conclusion, the results show that managing earnings either through discretionary accruals or real activities manipulation has a significant effect on predictive ability of $EARN$ and its components. These results are considered as a contribution to the literature of cash flow prediction as most of the previous studies examine the effect of discretionary accruals only. This evidence is important, because it shows that inaccuracies in predicting the future cash flows are driven not just by the discretionary accruals, but also by the management of real activities. Further, the results show that the abnormal CFO is the most significant factor among the other real earnings management proxies that negatively affect the predictive ability of $EARN$ and its components.

6.4.4 Additional Analyses: GCC and Non-GCC Country Firms

Up till this section, the results are averaged across many countries with different economic and financial reporting attributes. Therefore, additional analyses are conducted to test the sensitivity of the main results in the GCC and non-GCC country firms, due to the possibility that the significant differences between these two regions could influence the effect of earnings management and unintentional managerial errors on the predictive ability of $EARN$ and its components. For the sake of brevity, the results are tabulated in Appendix B. Despite the significant differences between the two regions, as noted in the descriptive statistics in Section 6.2, the regression results remain similar to those obtained when analysing the MENA region as whole.

Overall, the results show that earnings management through discretionary accruals and real activities manipulation reduces the predictive ability of $EARN$ and its components in the GCC and non-GCC country firms. Thus, this provides further evidence that managers in both regions exploit the flexibility embedded in the accounting standards to manipulate earnings opportunistically to have a private gain which, in turn, reduces the informativeness of $EARN$ and its ability to predict the one-year-ahead CFO. Further, the results show that even in the absence of intentional earnings management, the predictive ability of $EARN$ and its components is also affected by unintentional managerial errors in estimating accruals.

In conclusion, the similarity between the results of the two analyses alleviates concerns that the significant difference between the GCC and non-GCC country firms does not lead to biased results and thus elevates confidence in the validity of the findings obtained before.

6.5 Conclusion

Although existing literature focuses mainly on analysing the impact of discretionary accruals on the performance of the cash flow prediction models (e.g., Subramanyam, 1996; Al-Attar *et al*., 2008; Farshadfar and Monem, 2011; Nam *et al*., 2012), this thesis aims to extend this literature and provides further evidence on the impact of several earnings management techniques, discretionary accruals and real activities manipulation, along with unintentional managerial errors on the predictive ability of $EARN$ and its components.

Specifically, given results of previous research of Dechow and Dichev (2002), Francis *et al*. (2005) and Roychowdhury (2006), thesis hypothesizes that the predictive abilities of $EARN$, CFO and ACC are affected negatively by earnings management and unintentional managerial errors. Moreover, this thesis also investigates the effect of the determinants of the unintentional managerial errors as suggested by Dechow and Dichev (2002) and Francis *et al*. (2005) which are five firm-specific characteristics; namely, firm size, cash flow volatility, sales volatility, firm operating cycle length, and frequency of reporting negative $EARN$.

The results support the research hypotheses and find that discretionary accruals, real earnings management and unintentional managerial errors have a significantly negative impact on the predictive ability of $EARN$ and its components. One interpretation of the negative consequences of both earnings management approaches on the predictive ability of $EARN$ and its components is that the firms in the MENA region countries seems to engage intensively in opportunistic earnings management, rather than efficient earnings management, which produces noisy earnings estimation.

This thesis provides a new contribution to the cash flow prediction literature by providing an evidence that managers' discretion regarding accounting choices or managers 'decisions to alter real activities tend to have negative effects on the predictive ability of $EARN$ and its components. Thus, this thesis provides an evidence to validate that real activities manipulation can also affect the predictive ability of $EARN$ and its components despite the widespread belief that discretionary accruals is the only earnings management technique that the can affect the process of predicting future cash flows. The results show that the abnormal CFO is the most significant factor in real earnings management that can affect the cash flow prediction accuracy. This implies that firms that attempt to achieve high earnings by manipulating sales revenue through providing sales discounts and more lenient credit terms have lower ability to predict the one-year-ahead CFO.

Further, the findings of this chapter show that unintentional managerial errors are likely to have the dominant effect on the $EARN$ and CFO prediction models compared to the two earnings management approaches. This might be due to the fact that the mismeasurement in estimating accruals is usual transactions in organizations but earnings management might happen only occasionally (Dechow and Dichev, 2002; Taylor and Xu, 2010). Therefore, this thesis provides another contribution to the cash flow prediction literature by showing that even in the absence of earnings manipulation, the predictive ability of $EARN$ and its components is likely to be related to observable and recurring firm characteristics like firm size, operational volatility, operating cycle length and frequency of reporting losses. All of these firm characteristics jointly are associated with higher incidence of unavoidable and inaccurate estimation errors in accruals, which, in turn, affects the ability of $EARN$ and its components when predicting future cash flows.

Further, the results find that the predictive ability of $EARN$ and its components is a function of certain firm-specific characteristics. The findings provide evidence that shortening operating cycle length enhances the predictive ability of $EARN$ and its components. Further, the predictive abilities of $EARN$ and CFO are greater for firms characterised by low cash flow volatility, while the incremental contribution of ACC over the current CFO in improving the prediction of the one-year-ahead CFO is high for firms with a higher incidence of negative $EARN$ realizations. To sum up, Table 6.8 summarizes which research hypotheses are accepted or rejected based on the regression findings presented in this chapter.

Table 6.8: Hypotheses Test Results

Hypothesis	**Accepted or Rejected**
H5: Discretionary accruals in accounting have a negative impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.	Accepted
H6: Real activities manipulation has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.	Accepted
H7: Unintentional managerial errors in estimating accruals have negative impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.	Accepted
H8: Firm size has a positive impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.	Rejected
H9: Cash flow volatility has negative impact on the abilities of current $EARN$ and CFO to predict the one-year-ahead CFO.	Accepted
H10: Cash flow volatility has a positive impact on the ability of current ACC to predict the one-year-ahead CFO.	Rejected
H11: Sales volatility has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.	Rejected
H12: Operating cycle length has a negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.	Accepted
H13: Greater frequency of reporting negative $EARN$ has negative impact on the ability of current $EARN$ and its components to predict the one-year-ahead CFO.	Rejected

Finally, the next chapter continues by testing other factors that might affect the predictive ability of $EARN$ and its components; it focuses mainly on the impact of conditional and unconditional conservatism on the abilities of $EARN$ and ACC in predicting the one-year-ahead CFO.

Chapter 7

The Effect of Conditional and Unconditional Conservatism on the Predictive Ability of Earnings and its Components

7.1 Introduction

This chapter continues to explore the variables that might affect the predictive ability of $EARN$ and its components. The results of the previous chapter shows that earnings management through discretionary accruals and real activities in addition to the unintentional managerial errors, that arise from uncertainty in the company's operating environment, have a negative impact on the ability of $EARN$ and its components in predicting the one-year-ahead CFO. Therefore, to provide more in depth analysis on the prediction process of the one-year ahead CFO, this chapter aims to investigate whether accounting conservatism, as one of the commonly used accounting mechanisms, can have an impact on the prediction process of the one-year ahead CFO. It is expected that the recognition of the unrealized future expenses and losses, which reflects the conservative accounting practices, could enhance the ability of $EARN$ and its components in predicting the one-year ahead CFO.

Accounting conservatism, specifically conditional conservatism, ensures that potential economic losses and expenses are reported in earnings in a timely fashion, whereas the recognition of potential economic gains and revenues are delayed until they are verified (Basu, 1997). Thus, Kim and Kross (2005) argue that if losses impact the ability of the firm to generate future cash flows, earlier recognition of expenses or losses can make financial statements more relevant for cash flow prediction purposes. They support their argument and find that the predictive ability of $EARN$ has been increasing over the years due to the adoption of an increasing number of conservative accounting standards in the US.

Consistent with the findings of Kim and Kross (2005), Bandyopadhyay *et al*. (2010) provide evidence that accounting conservatism, either conditional or unconditional, enhances the ability of current $EARN$ to predict future cash flows in the US context. Thus, this chapter aims to reexamine the relationship between accounting conservatism, either through conditional or unconditional conservative accounting, and the predictive ability of $EARN$ (and its components) to determine whether the association between the two variables exists when tested in a different setting.

Since, the extant literature provides little evidence about the effect of accounting conservatism on the performance of the cash flow prediction models. Therefore, this thesis is able to draw upon the research literature, while also expanding and making a new contribution to an important feature of accounting information (i.e., accounting conservatism) that has been largely overlooked in addition to examining its effect on the predictive ability of $EARN$ and its components. To sum up, this chapter aims to answer the third research question of this thesis which is whether accounting conservatism affects the ability of $EARN$ and its components in predicting the one-year ahead CFO for firms in the MENA region over the time period 2008 to 2018.

The rest of this chapter is organised as follows. Section 7.2 provides the descriptive statistics for the cash flow prediction errors, accruals contribution, conditional and unconditional conservatism and control variables. Section 7.3 presents and discusses the correlation analysis between all the variables used in this chapter. Section 7.4 presents the regression analysis results. Finally, Section 7.5 concludes.

7.2 Descriptive Analysis

The descriptive statistics aim to provide an initial summary of the essential features of the dependent and independent variables used in the empirical analysis of this chapter. The dependent variables in this chapter are the same as Chapter 6 which are the absolute errors from predicting the one-year-ahead CFO that result from the $EARN$ model and CFO model as calculated in Chapter 5. Although Basu (1997) highlights that accounting conservatism affects earnings through accruals only rather than cash flows, the CFO prediction model is included in this chapter only to provide further investigation on whether accounting conservatism affects the predictive ability of the current CFO. ACC_CONT is another dependent variable which represents the accruals contribution over the current CFO in predicting the one-year-ahead CFO. ACC_CONT is calculated as the difference between the absolute prediction error of the CFO as the only predictor and the absolute prediction error using the CFO and total ACC together as predictors. The higher of ACC_CONT, the more ACC improve upon the CFO in predicting the one-year-ahead CFO.

The independent variables are conditional conservatism ($CONCOS$) and unconditional conservatism ($UNCONCOS$). On the one hand, consistent with Chen *et al.* (2014), the conditional conservatism is measured as the firm-specific asymmetric timeliness score developed by Khan and Watts (2009). Drawing from the Basu (1997) model, Khan and Watts (2009) estimate, at the firm level, the timeliness of earnings to good news (G_SCORE) and bad news (C_SCORE) and conclude that the C_SCORE measure captures variations in conditional conservatism very well. Khan and Watts (2009) base both measures (G_SCORE and C_SCORE) on a linear function of a firm's specific characteristics, including size, market-to-book ratio and leverage. These firm characteristics are commonly used as explanations of accounting conservatism in prior literature (e.g., LaFond and Watts, 2008; Ahmed and Duellman, 2012; Lara *et al*., 2016). Size ($SIZE2$) is measured as the natural logarithm of the market value of equity at the year-end. The market-to-book ratio (M/B) is the ratio of market value of equity to book value of equity at the end of year. Leverage (LEV) is the ratio of total liabilities divided by market value of equity at the year-end.

On the other hand, consistent with Chen *et al.* (2014), the unconditional conservatism measure is the cumulative non-operating accruals (total accruals minus operating accruals) over a five-year period deflated by total assets at the beginning of the period as in Givoly and Hayn (2000). Givoly and Hayn conclude that widespread and significant accumulation of negative non-operating accruals over time is consistent with increases in unconditional conservatism. More unconditionally conservative firms tend to recognize larger negative non-operating accruals from the relatively timely recognition of unrealized losses. Thus, $UNCONCOS$ is multiplied by negative one to facilitate interpretation. Consequently, larger values of both $CONCOS$ and $UNCONCOS$ indicate greater degree of conditional and unconditional conservatism in financial reporting.

The control variables in this chapter are the variables that proved to be associated with the predictive ability of $EARN$ and its components in Chapter 6. Thus, the control variables in this chapter are discretionary accruals (DIS_ACC), unintentional managerial errors ($Innate\_ACC$) and real earnings management (RM_PROXY). DIS_ACC and $Innate\_ACC$ are measured through the technique developed by Francis *et al*. (2005) which separates the

Dechow and Dichev (2002) measure of accruals quality into its discretionary and innate components. The discretionary component of accruals quality measures intentional manipulation of accruals. The innate component measures the unintentional estimation errors arising from the uncertainty in the company's operating environment. RM_PROXY is captured by the aggregation of the three metrics developed by Roychowdhury (2006) which are abnormal levels of CFO, production costs, and discretionary expenditures.

The sample size in this chapter is reduced compared to Chapter 5 due to the additional data requirements of unconditional conservatism measure which requires the accumulation of non-operating accruals over the past five years. Moreover, in order to avoid the confounding impact that may arise due to using a sample of observations pertaining to different firms, the sample is restricted to firm-years with complete data throughout the sample period. After deleting the observations lacking sufficient information to compute the two conservatism measures, the final sample includes 1,815 firm-year observations spanning 11-year period from 2008–2018.

This chapter begins with the descriptive statistics of the estimation model used to calculate conditional conservatism, and then presents descriptive statistics for all the variables used in the regression analysis to test the research hypotheses. Table 7.1 reports the mean coefficients from estimation of original Basu (1997) regression equation including the three firm specific characteristics ($SIZE2$, M/B and LEV) as suggested by Khan and Watts (2009) to calculate firm-specific conditional conservatism over the time period 2008 to 2018. T-statistics are calculated as in Fama and Macbeth (1973) to take into consideration cross-sectional correlation.

In the Basu (1997) earnings-return model, earnings per share deflated by the stock price per share at the beginning of year, X, is regressed on fiscal period stock returns, R. Thus, the coefficient on R measures the timeliness of earnings with respect to positive return (that is, good news). D is an indicator variable equal to 1 for bad-news firms (those with negative stock returns), and 0 for good-news firms (those with positive stock returns). Therefore, the coefficient on $D * R$ measures the incremental timeliness of earnings with respect to negative stock returns and indicates the sensitivity of earnings to bad news, that is, the timely loss recognition in earnings.

Table 7.1: Model Parameters of Estimating the Conditional Conservatism

	Coeff	t-statistics	Expected Sign
D	-0.114*	-2.03	
R	-0.194**	-2.24	+
$R * SIZE2$	0.043**	2.71	+
$R * M/B$	-0.007**	-2.21	-
$R * LEV$	0.004	0.23	-
$D * R$	0.317	1.39	+
$D * R * SIZE2$	-0.095**	-2.46	-
$D * R * M/B$	0.029**	2.86	+
$D * R * LEV$	0.184	1.67	+
$SIZE2$	0.012**	2.96	
M/B	-0.001	-0.55	
LEV	-0.016*	-2.07	
$D * SIZE2$	0.015*	1.82	
$D * M/B$	0.004	1.26	
$D * LEV$	0.064	0.91	
Constant	0.007	0.32	
Mean Adjusted R-squared	34%		

This table reports the estimated parameters in the following regression:

$$X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it}$$

Where, X_{it} is earnings before extraordinary items per share for year t, scaled by the stock price per share at the beginning of year t; R_{it} is the annual stock return from nine months before fiscal year-end t to three months after fiscal year-end t; D_{it} is a dummy variable equal to 1 when R_{it}<0 and equal to 0 otherwise; $SIZE2_{it}$ is the natural logarithm of market value of equity at the end of year t; M/B_{it} is the ratio of market value of equity to book value of equity at the end of year t; LEV_{it} is the ratio of total liabilities divided by market value of equity at the end of year t. The table reports t-statistics calculated as in Fama and Macbeth (1973) to take into consideration cross-sectional correlation. The table also reports the mean adjusted R-squared for this regression equation. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

Therefore, the primary concern in this chapter is the coefficient of $D * R$ and its interaction terms, which measures the degree of conditional conservatism. The three firm-specific characteristics ($SIZE2$, M/B and LEV) are interacted with $D * R$, following Khan and Watts (2009) approach in computing conditional conservatism. Table 7.1 shows that the coefficient of $D * R$ is positive as expected but insignificant, inconsistent with Basu (1997), Roychowdhury and Watts (2007), Khan and Watts (2009). Although the mean coefficient of $D * R$ is insignificant, the estimated coefficients on the interaction terms are significant except $D * R * LEV$. Once interaction terms are added, the main interest is in their significance, rather than the significance of the term used to compute them (Williams, 2015). Thus, the coefficient of $D * R$ is insignificant, probably because the interaction terms with $D * R$ soak up its effect.

The coefficient of the first interaction term $D * R * SIZE2$ is significantly negative as predicted, consistent with the claims that larger firms having lower asymmetric earnings timeliness (LaFond and Watts, 2008; Khan and Watts, 2009; Ahmed and Duellman, 2012). Thus, it is found that larger firms do not report conservative earnings as smaller firms do. The coefficient of the second interaction term $D * R * M/B$ is significantly positive; consistent with the notion that firms which have higher market-to-book ratio, have higher asymmetric earnings timeliness and are more conservative compared to firms that have low market-to-book ratio (Khan and Watts, 2009; André *et al*., 2015). This result is consistent with the argument that market-to-book ratio is directly related to conservatism because asymmetric verification requirements for gains versus losses build up a cumulative understatement of the net book value of a firm relative to the firm's true economic value (Khan and Watts, 2009).

The coefficient of the third interaction term $D * R * LEV$ is positive as expected but insignificant. This suggests that leveraged firms in the MENA region are not more conservative than unlevered ones in the MENA region which is inconsistent with Khan and Watts (2009). This might be due to the Islamic finance practices in some countries in the MENA region. Akinsomi, Ong, Ibrahim and Newell (2015) find that Islamic firms use less leverage than conventional firms in the GCC country firms. Islamic firms are constrained in the use of debt because they are not allowed to have debts exceeding their tangible assets (Ahmed, 2007), while conventional firms do not have such restrictions on debt (Akinsomi *et al*., 2015). Thus, it can be deduced that since firms in the MENA region are less dependent on debts due to the Islamic finance, the impact of leverage on conditional conservatism might be insignificant. Thus, given the specific nature of the MENA region and its dependence on Islamic finance, future research should modify the measure developed by Khan and Watts (2009) to identify variables that might capture the conditional conservatism better than leverage which proves to be insignificant.

Therefore, with the exception of LEV, the significance of $SIZE2$ and M/B as determinants of conservatism supports the argument of Khan and Watts about the importance of including these variables in estimating accounting conservatism. After getting the annual parameter estimate of the Basu (1997) model as modified by Khan and Watts (2009) for each industry, the coefficients of $D * R$, $D * R * SIZE2$, $D * R * M/B$, and $D * R * LEV$ are used to calculate the firm's conditional conservatism, $CONCOS\,(C\_SCORE)$ as in the following equation:

$$C\_SCORE = \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it} \tag{7.1}$$

where, λ_i, i=1-4 is the annual coefficient of $D * R$, $D * R * SIZE2$, $D * R * M/B$ and $D * R * LEV$, from the asymmetric earnings timeliness measure, as modified by Khan and Watts (2009), respectively.

Table 7.2 presents descriptive statistics for the major variables used in the multivariate regression analysis, along with additional variables that are used as control variables. Table 7.2 shows the mean, median, standard deviation, minimum and maximum values for dependent and independent variables. Given that this thesis focuses on the MENA region, the descriptive statistics are presented for the MENA region firms as a whole as well as for the GCC and non-GCC country firms separately to explore any potential significant differences in means for each of the variables between these two areas using a two tailed t-test. The results of the descriptive statistics of the $ABSE_{EARN}$, $ABSE_{CFO}$, ACC_CONT and control variables are to a great extent consistent with the results presented and discussed in Chapter 6. Thus, for sake of brevity the descriptive statistics of these variables are not reported here in this chapter.

Table 7.2 shows that the mean values of all the variables used in this chapter differ significantly between the GCC and non-GCC country firms at the conventional levels, except the level of accruals contribution and unconditional conservatism. Thus, the results of descriptive statistics show that although there are no significant differences in unconditional conservatism between the GCC and non-GCC country firms, there are significant differences in conditional conservatism between both regions. Therefore, two main analyses are conducted in this chapter to measure the effect of accounting conservatism on the predictive ability of $EARN$ and its components, one for the MENA region as whole, and then further analysis is conducted on two separate sub-samples for GCC and non-GCC country firms.

The firm-specific measure of conditional conservatism in the GCC country firms has a mean of 0.013 which is significantly lower than that of the non-GCC countries which has a mean of 0.109. This implies that the level of conditional conservatism in the GCC country firms is lower than their counterparts in the non-GCC. This can be attributed to the fact that many firms in the GCC country firms have shifted from applying the domestic GAAP to the IFRS. Zeghal, Chtourou and Fourati (2012), Lu and Trabelsi (2013) and André *et al*. (2015) find an overall decline in the degree of conditional conservatism after the IFRS adoption. As mentioned in Chapter 5, according to *OSIRIS* database, 94% of the firms in the GCC are using the IFRS in their financial reporting in 2018. In contrast, most of the non-GCC country firms are still using the domestic GAAP in their financial reporting.

This decline in $CONCOS$ in the GCC countries might be due two reasons. First, the IASB (2010) has removed the concept of conservatism from its Conceptual Framework because it biases accounting information and violates neutrality as mentioned in Chapter 3[4]. Second, the IASB has been moving away from conservative accounting to fair value accounting (Kim and Pevzner, 2010; Lu and Trabelsi, 2013; André *et al*., 2015). The fair value accounting essentially requires symmetric timeliness: both good news (i.e., gains) and bad news (i.e., losses) are recognized, and recognition of good news is not deferred (Kim and Pevzner, 2010). Thus, they argue that the fair value accounting is an opposite of the

[4] The IASB reintroduced conservatism in its Conceptual Framework in 2018. However, this will not affect the results of this thesis as the sample period ends in 2018.

conditional conservatism in accounting, which requires timelier recognition of bad news than of good news. Thus, it seems that applying the IFRS in the GCC country firms lead to having financial reports that are less conditionally conservative. By comparing the $CONCOS$ pre-IFRS and post-IFRS, (untabulated results), it is found that the $CONCOS$ pre-IFRS (-0.012) is significantly higher than post-IFRS (-0.058) in the GCC country firms at the 5% level.

Further, since the standard deviation of $CONCOS$ is higher in the GCC country firms compared to their counterparts in the non-GCC, this implies that $CONCOS$ is considerably more volatile in the GCC. This higher variability in the GCC country firms indicates that there is a variation among these firms in applying alternative levels of conditional conservatism. This is also shown by the huge discrepancy between minimum and maximum of $CONCOS$ in these firms. The minimum value of $CONCOS$ is -3.029 which represents aggressive reporting policy, while the maximum value is 31.602 which represents more conservative practices in financial reporting. This discrepancy in the level of conditional conservatism might be driven by different organizational structures and institutional factors across firms in these countries (Hamdan *et al.*, 2011; Khalifa *et al.*, 2016), along with the gradual adaptation from the domestic GAAP to the IFRS during the sample period.

Table 7.2:Descriptive Statistics for the Cash Flow Prediction Errors, Accruals Contribution and Conditional and Unconditional Conservatism

	GCC					Non-GCC						MENA Region				
Variables	**Mean**	**Median**	**SD**	**Min**	**Max**	**Mean**	**Median**	**SD**	**Min**	**Max**	**t-statistics**	**Mean**	**Median**	**SD**	**Min**	**Max**
$ABSE_{EARN}$	0.053	0.039	0.048	0.000	0.315	0.059	0.045	0.056	0.000	0.371	-2.51**	0.055	0.041	0.051	0.000	0.371
$ABSE_{CFO}$	0.052	0.039	0.046	0.000	0.294	0.060	0.045	0.054	0.000	0.310	-3.49***	0.055	0.041	0.049	0.000	0.310
ACC_CONT	0.002	0.002	0.022	-0.123	0.117	0.002	0.000	0.025	-0.126	0.207	-0.04	0.002	0.001	0.023	-0.126	0.207
$CONCOS$	0.013	0.026	1.369	-3.029	31.602	0.109	0.092	0.482	-1.542	6.930	-1.70*	0.046	0.043	1.143	-3.029	31.602
$UNCONCOS$	0.038	0.025	0.182	-0.566	1.698	0.027	0.024	0.200	-1.397	1.702	1.23	0.034	0.026	0.189	-1.397	1.702
DIS_ACC	0.000	-0.003	0.025	-0.086	0.339	-0.003	-0.006	0.025	-0.065	0.121	1.93*	-0.001	-0.004	0.025	-0.086	0.339
$Innate\_ACC$	0.026	0.023	0.017	-0.033	0.147	0.030	0.027	0.016	-0.003	0.149	-5.21***	0.027	0.024	0.016	-0.033	0.149
RM_PROXY	-0.077	-0.072	0.208	-0.839	0.637	0.022	0.009	0.214	-0.725	0.708	-9.63***	-0.043	-0.044	0.215	-0.839	0.708
Number of Observations	1, 188					627						1,815				

This table presents the descriptive statistics for the variables of absolute prediction errors, accruals contribution, conditional and unconditional conservatism, unintentional managerial errors, discretionary accruals and real earnings management. The mean, median, standard deviation, minimum and maximum values are presented in the columns for the GCC country firms, the non-GCC country firms, and the MENA region combined. The t-statistics column reports the t-statistics to identify any potential significant differences in mean values for each of the variables between the GCC and the non-GCC country firms. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively. GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Non-GCC countries include Egypt, Jordan, Morocco, and Tunisia. Variables definitions: $ABSE_{EARN}$ is the absolute prediction error of $EARN$ model; $ABSE_{CFO}$ is the absolute prediction error of CFO model; ACC_CONT is the difference between the absolute prediction errors between two models: (i) CFO model and (ii) CFO and ACC model, where $ABSE_t = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$; $CONCOS$ refers to the firm-year conditional conservatism measured by Basu (1997) asymmetric earnings timeliness measure, as modified in Khan and Watts (2009); $CONCOS(C\_SCORE) = \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}$, where λ_1, λ_2, λ_3 and λ_4 are estimated from the following regression: $X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it}$. $UNCONCOS$ refers to the firm-year's unconditional conservatism calculated by the accumulation of non-operating accruals over the past five years deflated by beginning total assets multiplied by negative one following Givoly & Hayn (2000);DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. All variables are trimmed at the 1 percent and 99 percent levels. The sample used in this chapter contains 1,815 observations over 2008–2018.

The descriptive statistics show that accrual-based measure of unconditional conservatism does not differ significantly between the GCC and non-GCC country firms. The $UNCONCOS$ has a mean (median) values of 0.038 (0.025) and 0.027 (0.024) for the GCC and non-GCC country firms, respectively. These positive values mean that accounting reports for both areas tend to be conservative. Furthermore, although there are variations in the $UNCONCOS$, these variations are not as large as the variations in $CONCOS$. Given the insignificant difference in the $UNCONCOS$ between the GCC and non-GCC. Therefore, it seems that the IFRS adaptation does not affect the degree of the unconditional conservatism as much as it affects the conditional conservatism. Consistent with Santi, Ghani and Puspitasari (2017), they find that unconditional conservatism has not changed significantly after the IFRS adaptation in the Indonesian companies.

Overall, the results of descriptive statistics show that conservative accounting practices are less prevalent in the MENA region compared to the US as the mean values of both conditional and unconditional conservatism are lower than the values reported in the prior US studies (e.g., Givoly and Hayn, 2000; Qiang, 2007; Khan and Watts, 2009; Bandyopadhyay *et al*., 2010; Chen *et al*., 2014). This is not a surprising result as the MENA region countries with weak investor protection and governance structure are not expected to have high levels of accounting conservatism compared to the US, consistent with Houcine (2013) and Nasr and Ntim (2018). These preliminary results show that, given the differences in the levels of accounting conservatism between the US and the MENA region, it is interesting to analyse how these differences in conservatism can affect the predictive ability of $EARN$ and its components.

7.3 Correlation Analysis

In order to analyse the relationship between the dependent and independent variables employed in this chapter, correlation analysis is examined first, then the next section provides a more detailed analysis of the relationship between variables through regression analysis. Moreover, the correlation analysis helps to ascertain whether there might be any multicollinearity problem among the independent variables. Table 7.3 presents the Pearson Correlations Matrix among the variables used in estimating the regression models of this chapter with their significance level.

Table 7.3 shows that $ABSE_{EARN}$ is significantly correlated with all the independent and control variables at the 1% level. $ABSE_{EARN}$ is positively correlated with the three control variables (DIS_ACC, $Innate\_ACC$ and RM_PROXY) as expected and found in Chapter 6. Despite the expectations that conditional conservatism is negatively related to the $ABSE_{EARN}$, the results show that $CONCOS$ measure is positively related to the $ABSE_{EARN}$. This means that conditional conservatism in the current period decreases the ability of $EARN$ to predict the one-year-ahead CFO. This unexpected sign is discussed later in the regression analysis in Section 7.4. However, consistent with the expectations that unconditional conservatism increases the ability of $EARN$ to predict one-year-ahead CFO, the results show that the $UNCONCOS$ measure is negatively related to the $ABSE_{EARN}$. Therefore, these results give a potential indication that accounting conservatism may be associated with the predictive ability of $EARN$ in the MENA region firms.

Table 7.3: Pearson Correlation Matrix for the Cash Flow Prediction Errors, Accruals Contribution and Conditional and Unconditional Conservatism

Variables	$ABSE_{EARN}$	$ABSE_{CFO}$	ACC_CONT	$CONCOS$	$UNCONCOS$	DIS_ACC	$Innate\_ACC$
$ABSE_{CFO}$	0.757***						
ACC_CONT	-0.299*	0.240***					
$CONCOS$	0.043***	-0.005	-0.084***				
$UNCONCOS$	-0.069***	0.008	0.079***	0.028			
DIS_ACC	0.134***	0.067***	-0.055**	-0.027	-0.046*		
$Innate\_ACC$	0.245***	0.212***	-0.034	0.124***	0.050**	-0.074***	
RM_PROXY	0.189***	0.195***	-0.083***	0.017	0.006	0.028	0.205***

This table presents the Pearson Correlation Matrix for the variables of absolute prediction errors, accruals contribution, conditional and unconditional conservatism, earnings management and unintentional managerial errors. ***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively. Variables definitions: $ABSE_{EARN}$ is the absolute prediction error of $EARN$ model; $ABSE_{CFO}$ is the absolute prediction error of CFO model; ACC_CONT is the difference between the absolute prediction errors between two models: (i) CFO model and (ii) CFO and ACC model, where $ABSE_t = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$; $CONCOS$ refers to the firm-year conditional conservatism measured by Basu (1997) asymmetric earnings timeliness measure, as modified in Khan and Watts (2009); $CONCOS(C\_SCORE) = \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}$, where λ_1, λ_2, λ_3 and λ_4 are estimated from the following regression: $X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it}$; $UNCONCOS$ refers to the firm-year's unconditional conservatism calculated by the accumulation of non-operating accruals over the past five years deflated by beginning total assets multiplied by negative one following Givoly & Hayn (2000); DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. All variables are trimmed at the 1 percent and 99 percent levels. The sample used in this chapter contains 1,815 observations over 2008–2018.

Table 7.3 shows that neither of the two conservatism measures are correlated with the $ABSE_{CFO}$. The insignificant correlation between $ABSE_{CFO}$ and accounting conservatism is expected because accounting conservatism reflected in earnings is mainly due to the accrual component of earnings, not the cash flow component of earnings (Basu, 1997; Pae *et al*., 2005).Thus, the $ABSE_{CFO}$ is dropped from the regression models.

The correlation analysis in Table 7.3 shows that ACC_CONT is significantly related to all the independent and control variables. ACC_CONT is negatively correlated with the three control variables (DIS_ACC, $Innate\_ACC$ and RM_PROXY) as expected and found in Chapter 6. Since accounting conservatism acts through accruals, thus it is found that ACC_CONT is significantly correlated to the two proxies of conservatism at the 1% level. Unexpectedly, ACC_CONT is negatively correlated to the $CONCOS$. Thus, it seems that the predictive abilities of $EARN$ and ACC are decreased with a higher level of conditional conservatism inconsistent with the expectations in the research hypotheses. This unexpected correlation needs further investigation in the regression analysis in Section 7.4. However, ACC_CONT is positively correlated to the $UNCONCOS$, which is consistent with the expectation that ACC play an important role in predicting the one-year-ahead CFO in conservative firms.

The results of Table 7.3 show that there is no significant evidence of an association between the two proxies of accounting conservatism. These results imply that each proxy captures a different dimension of conservatism which necessitates using both proxies in order to provide a comprehensive analysis of the impact of accounting conservatism on the predictive ability of $EARN$ and its components. On the one hand, conditional conservatism captures the relative speed with which good and bad news about assets in place is reflected in financial statements. On the other hand, unconditional conservatism captures the idea of of understating the book value of assets relative to their economic value, independent from any news. Hence, these results support the claims of Givoly *et al*.'s (2007) that relying on a single measure of conservatism can lead to incorrect inferences and thus support the usage of both measures of conservatism in the analysis of this chapter.

Additionally, Table 7.3 shows that there is no significant evidence of an association between accounting conservatism and earnings management except for a weak negative relation between unconditional conservative accounting and discretionary accruals at the 10% significance level. The negative correlation between $UNCONCOS$ and DIS_ACC supports the argument that conservative reporting reduces the managerial opportunism and constrains earnings manipulation (Watts, 2003; Guay and Verrecchia, 2006). However, as found in Chapter 6, the managers in the MENA region have the tendency to manipulate earnings opportunistically rather than efficiently. Therefore, it seems that opportunistic financial reporting is not counterbalanced by a sufficient level of accounting conservatism in the MENA region firms. Accordingly, it seems that the earnings management is likely to dominate the financial reporting in the MENA region firms compared to accounting conservatism.

Moreover, $Innate\_ACC$ is positively correlated with both $CONCOS$ and $UNCONCOS$, indicating that the unintentional managerial errors stemming from the operating risk surrounding firm's environment are associated positively with accounting conservatism, no matter the type. Thus, firms with higher unintentional managerial errors, due to greater operating risk, are more conservative in their financial reporting. Finally, Table 7.3 shows that none of the correlation values exceed 0.8. Hence, correlations between independent variables are not of a sufficient magnitude to raise concerns about multicollinearity problems for the regression analyses.

In conclusion, these preliminary results based on Pearson correlation are in line with the expectations in the research hypotheses that the abilities of $EARN$ and ACC in predicting the one-year-ahead CFO are affected by conditional and unconditional conservatism. However, the sign of conditional conservatism is opposite to the predictions. Since these correlations are merely univariate associations; thus, multivariate regression analyses should be conducted for further inferences and to provide more accurate tests of the research hypotheses.

7.4 Regression Analysis

All regression models in this chapter are estimated in a panel data estimator with the FEM. The Hausman (1978) test results indicate that the FEM, rather than the REM, is the more appropriate for all the regression models used in this chapter. Reported t-statistics are based on the White (1980) robust standard errors for all the regression models in this chapter to mitigate the impact of heteroskedasticity and autocorrelation on the results. Furthermore, although the results in the previous section show that the correlation between the independent variables and control variables are low, the VIF is estimated to provide further tests on whether multicollinearity is a problem in this chapter. The results show that the VIFs for all independent variables are below 10, indicating that multicollinearity concern is unlikely to affect the empirical inferences. In the next subsections, the two dependent variables ($ABSE_{EARN}$ and ACC_CONT) are regressed against (i) conditional conservatism; (ii) unconditional conservatism; and (iii) both conditional and unconditional in a comprehensive model.

7.4.1 Conditional Conservatism

Since a previous study by Bandyopadhyay *et al*. (2010) finds that the conditional conservatism enhances the ability of $EARN$ in predicting the one-year-ahead CFO in the US firms, thus it is expected that conditional conservatism has the same effect on the ability of $EARN$ and contribution of ACC in predicting one-year-ahead CFO in the MENA region firms. Therefore, this section examines whether conditional conservatism contributes to enhancing the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO. To date, there is no prior literature on the links between conditional conservatism and cash flow predictability, except for Bandyopadhyay *et al*. (2010) study.

Table 7.4 provides the multivariate regression results of testing the effect of the $CONCOS$ on two variables $ABSE_{EARN}$and ACC_CONT. Table 7.4 reports regression results where the dependent variable in the first column is the $ABSE_{EARN}$ (Model 1a), while the dependent variable in the second column is ACC_CONT (Model 2a). The independent variable in both models is $CONCOS$ along with a set of control variables which are; DIS_ACC, $Innate\_ACC$ and RM_PROXY. Table 7.4 also shows results of Hausman's tests, F-tests of overall significance, VIF and F-tests of whether the coefficients of the independent variables are equal to identify which variable has a stronger effect on the dependent variable for the MENA region firms.

Table 7.4: The Effect of Conditional Conservatism on the Predictive Abilities of Earnings and Accruals in the MENA Region Firms

	Model 1a $ABSE_{t,EARN}$			Model 2a ACC_CONT_t		
Hausman Test	19.27***			36.67***		
Adjusted R-squared	0.28			0.10		
F-statistics	22.49***			14.08***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$CONCOS_{t-1}$	0.002	1.62	-	-0.001	-1.37	+
DIS_ACC_{t-1}	0.205***	2.56	+	-0.051*	-1.38	-
$Innate\_ACC_{t-1}$	0.418***	3.56	+	-0.110*	-1.69	-
RM_PROXY_{t-1}	0.063***	3.88	+	-0.034***	-5.10	-
Constant	0.047***	14.36		0.004**	2.09	
Maximum VIF	1.07					
Mean VIF	1.03					
Number of Observations	1,815					
F-test of Coefficient Equality: Null Hypothesis	F-statistics			p-value		
Coefficients on DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1} in Model (1a) are equal	9.27***					
Coefficients on DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1} in Model (2a) are equal				0.75		

This table presents regression summary statistics of estimation the regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $CONCOS$ refers to the firm-year conditional conservatism measured by Basu (1997) asymmetric earnings timeliness measure, as modified in Khan and Watts (2009); $CONCOS(C\_SCORE)= \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}$, where λ_1, λ_2, λ_3 and λ_4 are estimated from the following regression: $X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it}$;DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

F-statistics show that the two models are statistically significant at the 1% level. However, the results show that the coefficient of $CONCOS$ is insignificant in both Models 1a and 2a. These results do not support Hypothesis 14 that states that conditional conservatism enhances the abilities of $EARN$ and ACC in predicting the one-year ahead CFO. This implies that conditional conservatism as measured by Basu's asymmetry timeliness measure and modified by Khan and Watts (2009) is insignificantly related to the abilities of $EARN$ or ACC in predicting the one-year-ahead CFO.

This result is inconsistent with Bandyopadhyay *et al*. (2010); this might be explained by differences in the sample composition, differences in the countries studied, and differences in the measures used to capture conditional conservatism. Bandyopadhyay *et al*. employ two conservatism proxies rather than the earnings asymmetric timeliness measure. They use cumulative non-operating accruals and conservatism index based on several measures in Givoly & Hayn (2000). They state that these two measures capture both dimensions of accounting conservatism, conditional and unconditional, without distinguishing between them. According to the accounting literature, the most widely used measure to capture the conditional conservatism is the Basu (1997) model. Therefore, this thesis aims to expand the existing literature by examining the effect of conditional conservatism as measured by Basu's asymmetry timeliness measure and modified by Khan and Watts (2009) on the cash flow predictability. However, the results of this thesis demonstrate the lack of any significant relationship between conditional conservatism and the predictive ability of $EARN$ or even the incremental contribution of ACC.

These results might be due to two reasons. First, the IFRS adoption in many of the MENA region firms, especially the GCC country firms, which results in a decline of the degree of conditional conservatism. Recently, the IFRS are based on fair value accounting rather than conservative accounting, and some have argued that removing conservatism from the Conceptual Framework will result in the loss of important benefits of conservatism (Watts, 2003; André *et al*., 2015). Second, the significant differences between the GCC and the non-GCC country firms, especially in the conditional conservatism as noted in Section 7.2, might bias the regression results. Specifically, since conditional conservatism differs significantly in both regions, the impact of one region may outweigh the impact of the other when the whole MENA region is tested. Therefore, robustness check is done later in Section 7.4.4 by running separate regression for the GCC and the non-GCC country firms.

Further, all control variables in Models 1a and 2a have the expected signs and are significant as found in Chapter 6, in which the $ABSE_{EARN}$ is positively related to DIS_ACC, $Innate\_ACC$ and RM_PROXY, while the ACC_CONT is negatively related to DIS_ACC, $Innate\_ACC$ and RM_PROXY[5]. Thus, this adds credibility to the results found in Chapter 6 that earnings management and unintentional managerial errors have an effect on the ability of $EARN$ and the contribution of ACC in predicting one-year-ahead CFO even after taking conservatism into consideration. Further, F-test of coefficient equality strongly rejects the null that the coefficients on DIS_ACC, $Innate\_ACC$ and RM_PROXY are equal in Model 1a, while the null is accepted in Model 2a. Overall, these findings are consistent with those reported in Chapter 6 and confirm that the unintentional managerial errors have the greatest

[5] Since accounting conservatism constrains earnings management practices (Watts, 2003), Lara *et al*. (2020) find that there is a negative relation between accounting conservatism and earnings management. Thus, the results of Table 7.4 and Table 7.5 are re-analysed after removing earnings management variables to be able to provide an in-depth analysis of the effect of conservatism on the predictive abilities of $EARN$ and ACC. However, the un-tabulated results show that the results of Table 7.4 and Table 7.5 are unaffected by the elimination of earnings management variables.

effect on the predictive ability of $EARN$. However, DIS_ACC, $Innate\_ACC$ and RM_PROXY have the same effect on the accruals contribution.

In summary, the overall results suggest that neither the ability of $EARN$ nor the contribution of ACC in predicting the one-year-ahead CFO are affected by conditional conservatism. However, the discretionary accruals, unintentional managerial errors and real earnings management consistently continue to have a significant impact on the predictive abilities of $EARN$ and ACC as outlined in Chapter 6.

7.4.2 Unconditional Conservatism

Kim and Kross (2005) and the subsequent study of Bandyopadhyay *et al*. (2010) indicate that unconditional conservatism has an effect on the ability of $EARN$ in predicting the one-year-ahead CFO in the US firms. Thus, in order to provide an out-of-sample test of these studies, this chapter aims to analyse whether the relationship between unconditional conservatism and the predictive ability of $EARN$ exist in the MENA region firms. In addition, this thesis contributes to knowledge by examining the effect of unconditional conservatism on the ACC contribution upon the CFO in predicting the one-year-ahead CFO. Given the sample in this thesis that differs from that of previous studies, it is possible that a replication of previous work on a sample of the developing countries in the MENA region could yield different results than that of the US.

Table 7.5 provides the multivariate regression results of testing the impact of the unconditional conservatism on both the ability of $EARN$ and contribution of ACC in predicting the one-year-ahead CFO. Thus, this section repeats the analysis in Table 7.4 using accrual-based measure of unconditional conservatism developed by Givoly and Hayn

(2000). Since the model specifications of Table 7.5 are largely the same as in Table 7.4 except for the difference in conservatism measurement, thus the results in Table 7.5 are not discussed in details to avoid repetition.

Table 7.5 finds initially that the coefficient on DIS_ACC, $Innate\_ACC$ and RM_PROXY remains significant and with their expected signs in both models, confirming the earlier findings in Table 7.4. However, Table 7.5 shows that $UNCONCOS$ is insignificant in Model 1b which is inconsistent with Kim and Kross (2005) and Bandyopadhyay *et al*., (2010) who show that unconditional conservatism affects the predictive ability of $EARN$ in the US. Given the results of Table 7.4 and Table 7.5, it is apparent that conservatism whether conditional or unconditional has no impact on the predictive ability of $EARN$ in the MENA region. However, consistent with the results in Chapter 6, unintentional managerial errors and earnings management seem to have the most dominant effect on the predictive ability of $EARN$ in the MENA region. This, in turn, implies that the control on accounting standards in the MENA region still faces some weaknesses.

Consistent with the research hypothesis which expects that unconditional conservatism is positively related to the ability of ACC to predict the one-year-ahead CFO, the results of Table 7.5 show that there is a positive and significant relationship between the $UNCONCOS$ and ACC_CONT at the 10% level. This suggests that a greater degree of unconditional conservatism is associated with an increase in the contribution of ACC upon the current CFO to the one-year-ahead CFO predictions.

Table 7.5: The Effect of Unconditional Conservatism on the Predictive Abilities of Earnings and Accruals in the MENA Region Firms

	Model 1b $ABSE_{t,EARN}$			Model 2b ACC_CONT_t		
Hausman Test	17.96***			33.24***		
Adjusted R-squared	0.28			0.12		
F-statistics	18.93***			12.98***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$UNCONCOS_{t-1}$	-0.012	-1.08	-	0.010*	1.84	+
DIS_ACC_{t-1}	0.203***	2.57	+	-0.040*	-1.69	-
$Innate\_ACC_{t-1}$	0.445***	3.79	+	-0.132**	-1.93	-
RM_PROXY_{t-1}	0.062***	3.81	+	-0.033***	-4.96	-
Constant	0.047***	14.2		0.004**	2.12	
Maximum VIF	1.05					
Mean VIF	1.03					
Number of Observations	1,815					
F-test of Coefficient Equality: Null Hypothesis	F-statistics			p-value		
Coefficients on DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1} in Model (1b) are equal	5.44***					
Coefficients on $UNCONCOS_{t-1}$, DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1} and in Model (2b) are equal				1.17		

This table presents regression summary statistics of estimation the regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $UNCONCOS$ refers to the firm-year's unconditional conservatism calculated by the accumulation of non-operating ACC over the past five years deflated by beginning total assets multiplied by negative one, following Givoly & Hayn (2000); DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

These results mean that although the contribution of ACC in predicting the one-year-ahead CFO decreases with higher levels of DIS_ACC, $Innate\_ACC$ and RM_PROXY, $UNCONCOS$ can enhance the contribution of ACC upon the CFO in one-year-ahead CFO prediction model compared to the model that contains current CFO alone. Therefore, these results imply that Hypothesis 15 is rejected as conditional conservatism has an insignificant impact on the predictive ability of $EARN$, while it has only a weakly significant impact on the predictive ability of ACC.

To sum up, although the unconditional conservatism does not have a significant impact on the predictive ability of $EARN$ in the MENA region firms, the results of this chapter shows that it has a weakly significant impact on the predictive ability of ACC which can imply that unconditional conservatism can play a role in improving the CFO prediction process. Therefore, this might be one of the reasons why the prediction model which contains CFO and total ACC is the best in predicting one-year-ahead CFO over the other five prediction models, as found in Chapter 5. These results should motivate managers to use more conservative accounting practices in the MENA region firms to impart greater relevance to accounting numbers and to offset the opportunistic earnings management practices that are embedded in these countries.

7.4.3 Comprehensive Models

Since there is no correlation between the two measures of accounting conservatism as each measures a different dimension of conservatism as found in Section 7.3, a regression model which retains both measures together is conducted and the results are reported in Table 7.6. This model is considered as a comprehensive model which includes all the major variables, earnings management, unintentional managerial errors and accounting conservatism, that might affect the predictive abilities of $EARN$ and ACC.

After retaining all these variables, the coefficient estimates of the DIS_ACC, $Innate\_ACC$ and RM_PROXY are still significant and with the predicted signs. Further, the results show that although the $CONCOS$ becomes significant in Model 1c, it remains insignificant in Model 2c. In addition, the results show that the $UNCONCOS$ remains insignificant in Model 1c and significant in Model 2c as reported in Table 7.5. Thus, these results support the previous findings that increasing level of unconditional conservatism has contributed to enhance the contribution of ACC upon CFO in predicting the one-year-ahead CFO. One exception is that the conditional conservatism becomes significant in Model 1c. Table 7.6 shows that $CONCOS$ has a positive relationship with $ABSE_{EARN}$, which means that the higher level of conditional conservatism, the lower the predictive ability of $EARN$, inconsistent with research hypothesis.

Although accounting conservatism implies the exercise of caution in the recognition and measurement of income and assets, this result implies that conditional conservatism cannot be considered as one of the desirable features in the MENA region firms. This can be attributed to the fact that many firms in the MENA region have shifted from applying the domestic GAAP to the IFRS. The IFRS allows some degree of flexibility in conservative accounting choices (Pham, 2009). Thus, flexibility in conservative accounting choices embedded in the IFRS seems to affect negatively the ability of $EARN$ to predict the one-year-ahead CFO.

Table 7.6: Comprehensive Models for the MENA Region Firms

	Model 1c $ABSE_{t,EARN}$			Model 2c ACC_CONT_t		
Hausman Test	19.13***			34.80***		
Adjusted R-squared	0.28			0.12		
F-statistics	7.26***			7.40***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$CONCOS_{t-1}$	0.002*	1.66	-	-0.001	-1.40	+
$UNCONCOS_{t-1}$	-0.012	-1.11	-	0.010*	1.90	+
DIS_ACC_{t-1}	0.203***	2.56	+	-0.040*	-1.80	-
$Innate\_ACC_{t-1}$	0.422***	3.59	+	-0.113**	-1.77	-
RM_PROXY_{t-1}	0.062***	3.84	+	-0.033***	-5.02	-
Constant	0.047***	14.34		0.004	1.97	
Maximum VIF	1.07					
Mean VIF	1.03					
Number of Observations	1,815					

This table presents regression summary statistics of estimation the regression models using the FEM for the MENA region firms, where FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $CONCOS$ refers to the firm-year conditional conservatism measured by Basu (1997) asymmetric earnings timeliness measure, as modified in Khan and Watts (2009). $UNCONCOS$ refers to the firm-year's unconditional conservatism calculated by the accumulation of non-operating accruals over the past five years deflated by beginning total assets multiplied by negative one, following Givoly & Hayn (2000); DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Since the previous results suggest that the adoption of IFRS might have an impact on conditional conservatism, Section 7.4.4 extends on these results by testing the effect of conditional conservatism on the predictive abilities of $EARN$ and ACC in the GCC and non-GCC country firms since the GCC country firms are applying the IFRS.

7.4.4 Additional Analyses: GCC and Non-GCC Country Firms

As a sensitivity check, this chapter repeats the analysis shown in Tables 7.4 and 7.5, by running separate regressions for each of the GCC and non-GCC country firms. For the sake of brevity, the results are tabulated in Appendix C. As noted in the descriptive analysis, the t-test does not show any significant differences in the unconditional conservatism practices between the GCC and non-GCC country firms. Thus, the results find that the unconditional conservatism still has no effect on the predictive ability of $EARN$ in the GCC and non-GCC country firms.

However, when analyzing the impact of the unconditional conservatism on the predictive ability of ACC in the GCC and non-GCC country firms, the results show that although the unconditional conservatism has a weak significant impact on the accruals contribution in the GCC, as noticed in the MENA region, the results show that unconditional conservatism has insignificant relationship with accruals contribution in the non-GCC country firms. This can be attributed to the small sample size of the non-GCC country firms which may negatively affect the results.

Consistent with the results of the MENA region, the results of both the GCC and non-GCC country firms show that conditional conservatism has no impact on the contribution of ACC in predicting the one-year-ahead CFO. Concerning the results related to the $ABSE_{EARN}$ and

$CONCOS$, the coefficient of $CONCOS$ in the GCC country firms is positive and significant, while it is negative and significant in the non-GCC country firms. Thus, a conditional conservative policy in the GCC country firms is found to be negatively related to the ability of $EARN$ in predicting the one-year-ahead CFO, which is inconsistent with the expectations in the research hypotheses and the findings of the US firms in Bandyopadhyay *et al*., (2010). While, consistent with the research hypotheses and prior study by Bandyopadhyay *et al*., conditional conservative policy in the non-GCC is positively related to the predictive ability of $EARN$. Therefore, this result provides evidence that conditional conservatism is beneficial for cash flow prediction process in the non-GCC country firms, while it is considered detrimental for this process in the GCC country firms.

This, in turn, raises questions why the ability of $EARN$ to predict the one-year-ahead CFO decreases with conditional conservatism in the GCC country firms, although accounting conservatism is supposed to be an efficient financial reporting mechanism to offset any uncertain business situation. The potential explanation of this finding might be due to the fact that most of the GCC country firms are IFRS oriented that exhibit lower level of conditional conservatism compared to their non-GCC counterpart as highlighted in the descriptive statistics. Further, the results of this section may imply that the GCC firms are encountering improper application of conditional conservatism principles which may prevent the financial reporting of these countries from reaching the level of conditional conservatism targeted by the IASB.

Although, the IASB (2010) removes the term conservatism from the Conceptual Framework, the IFRS does include numerous mechanisms ensuring the application of conditional conservatism (Hellman, 2008; Barker and Mcgeachin, 2015; André *et al*., 2015). These studies argue that the lower of cost or net realizable values for inventories (IAS 2), the recognition of contingent liabilities versus the non-recognition of contingent assets (IAS 37), impairment for assets (IAS 36), or the capitalisation and impairment of development costs (IAS 38) are examples of conditional conservatism practices. However, although these standards can result in high level of conditional conservatism through the earlier recognition of potential economic losses in earnings (Hellman, 2008; André *et al*., 2015), the fact that they are based on fair values and judgements can motivate managers to use them for opportunistic reasons rather than being conservative (Pham, 2009; Ramanna and Watts, 2012).

For example, IAS 36, which deals with impairment testing for all tangible and intangible assets, is considered the IFRS main mechanism to ensure conditional conservatism (Beaver and Ryan, 2005; Qiang, 2007; André *et al*., 2015). Thus, highlighting the idea of conditional conservatism, this standard states that its objective is to ensure that an entity's assets are carried at no more than their recoverable amount (i.e., the higher of fair value and value-in-use). If carrying amount of an asset is greater than its recoverable amount, then this asset should be impaired and the standard requires the entity to recognise an impairment loss in earnings. This is particularly the case for intangible assets with an indefinite useful life among which is the goodwill. Goodwill is tested for impairment systematically once a year to capture accurately the decline in its value (IAS 36), while it is amortized on a systematic basis under the domestic GAAP in Egypt, Tunisia and Jordan (PricewaterhouseCoopers, 2020).

The implementation of impairment tests usually relies on valuation models which involves subjective judgments, and is prone to manipulation by managers because it relies on unverifiable fair value estimates (Hilton and O'Brien, 2009; Petersen and Plenborg, 2010; Ramanna and Watts, 2012). Therefore, the managers can use the fair value estimates in the impairment tests either to convey their credible private informationon to future cash flows or to take advantage of the unverifiable discretion for their private incentives. Bostwick, Krieger and Lambert (2016) argue that the annual impairment is intended to more closely correlate goodwill impairment write-offs with the $FCFO$. They argue and also find that goodwill impairments embedded in $EARN$ calculation provide useful information and incremental improvement in the prediction of the $FCFO$.

Therefore, given the flexibility that IFRS allows, it is apparent that conditional conservatism and earnings management can have similar implications. Specifically, they both can have beneficial and detrimental economic effects. Similar to earnings management, conditional conservatism can be classified into opportunistic conditional conservatism which result from the biased application of the IFRS or efficient conditional conservatism which arise from purposeful intervention in the financial reporting process to constraint the managerial opportunism. After the IFRS adoption, it seems that the GCC country firms tend to engage in opportunistic conditional conservatism through exploiting the flexibility inherent in the IFRS, which adversely affect the information content of reported $EARN$, making them less predictive of future cash flows.

Furthermore, another reason for the observed negative relation between the predictive ability of $EARN$ and conditional conservatism is the lack of knowledge and experience of the accountants especially in developing countries that are also characterized by the lack of corporate governance. This, in turn, significantly affects the successful implementation of IFRS. In this regard, Misirlioglu, Tucker and Yukselturk (2013) find that, in Turkey, the inadequate management information systems along with the lack of enforcement and corporate governance issues hinder the successful implementation of IFRS. In addition, Misirlioglu *et al*. find that the standards related to fair value, impairment and financial instruments are considered as the most problematic standards for firms, which is consistent to the above argument about the impairment and fair value estimates. Thus, the inappropriate implementation of the IFRS especially in standards related to conditional conservatism might negatively affect the ability of $EARN$ in predicting the $FCFO$.

Given the results of Chapter 5, that show the superiority of the explanatory power of $EARN$ in predicting the one-year-ahead CFO in the non-GCC country firms compared to their counterparts in the GCC country firms, along with the results of this chapter that show that conditional conservatism has a positive (negative) impact on the predictive ability of $EARN$ in the non-GCC (GCC) country firms, it can be inferred that conditional conservatism can be among the reasons that lead to the superiority of the $EARN$ model in the non-GCC country firms.

In conclusion, this thesis contributes to the existing literature in several ways. First, the results of this thesis are likely to provide new insights into the debate about the conservatism concept. On the one hand, the results show that unconditional conservatism serves as an accounting mechanism that facilitates the cash flow prediction process. On the other hand, the effect of conditional conservatism on the cash flow predictability depends on the applied accounting standards and the managerial intent (opportunism versus efficient). Second, the findings in this thesis suggest that actions by the IASB to provide more neutral accounting information based on fair value estimates result in a reduction in the ability of $EARN$ to provide information useful in assessing the amount and timing of future cash flows.

Therefore, this thesis provides a theoretical explanation for why a demand for more conservative accounting than fair value accounting might still exist. Consequently, the considerable confusion over the accounting conservatism concept, especially after the IFRS adoption, deserves further research attention. Future research specifically could focus on how adoption of the IFRS in the MENA region, European Union, Canada and other countries affects informational benefits of conditional conservatism, especially when predicting the $FCFO$. Understanding this relation would be particularly important in light of recent strong moves to adopt the IFRS in many countries.

7.5 Conclusion

Despite the large literature on accounting conservatism, few studies have investigated its effect on the ability of $EARN$ in predicting the one-year-ahead CFO, while no study to date examine its effect on the incremental contribution of ACC upon CFO in predicting one-year-ahead CFO. Thus, this chapter extends previous research that examines the accounting conservatism and cash flow predictability through investigating the effect of accounting conservatism, either conditional or unconditional, on the ability of $EARN$ and contribution of ACC in predicting one-year-ahead CFO in the MENA region firms. This chapter uses multiple measures to capture accounting conservatism, including the extension of the Khan and Watts (2009) version of the Basu (1997) measure also known as the C_SCORE for conditional conservatism and negative non-operating accruals developed by Givoly and Hayn (2000) for the unconditional conservatism, consistent with Chen *et al*. (2014)

The tests in this chapter control for discretionary accruals, unintentional managerial errors and real earnings management. The results suggest that accounting conservatism in general (no matter conditional or unconditional conservatism) is not associated with the ability of $EARN$ in predicting one-year-ahead CFO in the MENA region firms. By running additional analysis to separate between the GCC and non-GCC country firms, the results find that the unconditional conservatism still has no effect on the predictive ability of $EARN$. This might be driven by a preponderance of firms engaging in opportunistic earnings management more than exhibiting a higher level of unconditional conservatism practices in the MENA region.

However, the findings show considerable confusion over conditional conservatism when running a separate regression for each of the GCC and non-GCC country firms. The results show that conditional conservatism is negatively associated with $EARN$'s predictive ability in the GCC country firms but positively associated with $EARN$'s predictive ability in the non-GCC country firms. Since the GCC country firms are IFRS-oriented, thus, this unexpected result might be due to the new trend in the financial reporting, especially after the IFRS adaptation, which is moving away from conservative accounting to fair value accounting.

Under fair value accounting, managers have the opportunity to undertake earnings management activities by manipulating fair values for opportunistic purposes such as meeting or beating earnings forecasts or maximizing bonuses (Ramanna &Watts, 2012). This is particularly true when market values of assets are not readily available and managers must make subjective judgments to derive asset market values for the impairment test which is considered one of the main practices of conditional conservatism under the

IFRS. The foregoing managerial opportunism incentives tend to adversely affect the information content of reported accounting earnings, making them less predictive of future cash flows.

Turning to the effect of accounting conservatism on ACC contribution upon CFO in the prediction of one-year-ahead CFO, it is found that conditional conservatism does not have any significant effect on the ACC contribution in the GCC, non-GCC and MENA region firms. However, the regression results provide consistent evidence that unconditional conservatism enhances the ACC contribution over the CFO in predicting the one-year-ahead CFO in the GCC and MENA region firms. To sum up, Table 7.7 summarizes which research hypotheses are accepted or rejected based on the regression findings presented in this chapter.

Table 7.7: Hypotheses Test Results

Hypothesis	Accepted or Rejected
H14: Conditional conservatism has a positive impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.	Rejected
H15: Unconditional conservatism has a positive impact on the abilities of current $EARN$ and ACC to predict the one-year-ahead CFO.	Rejected

Chapter 8

Conclusion, Limitations, Implications and Recommendations for Future Research

8.1 Introduction

The aim of this chapter is to provide a comprehensive summary of the results of this thesis along with discussing the main limitations, drawing out implications and providing recommendations for future research in the cash flow prediction field. Section 8.2 summarizes the objectives of this thesis along with the main results. In Section 8.3, the limitations of the research are discussed. In Section 8.4, several implications are derived. Finally, Section 8.5 provides recommendations for future research.

8.2 Research Aim and Objectives

The main purpose of this thesis is to investigate the ability of $EARN$ and its components to predict the one-year-ahead CFO in the MENA region firms. In addition, this thesis aims to examine the factors that can affect the predictive ability of $EARN$ and its components. In order to achieve this aim, this thesis has five main research objectives, outlined in Chapter 1. These objectives provide a clear roadmap to follow. Thus, this section revisits the objectives of this thesis and addresses how they were accomplished.

Objective 1: Provide a comprehensive literature review regarding the ability of $EARN$ and its components to predict the $FCFO$.

One of the main objectives in this thesis is to review the academic literature on prediction of firm's future cash flows. Cash flow prediction is a fundamental issue in accounting and finance given that the value of firm's securities depends upon its ability to generate future cash flows (Barth *et al*., 2001; Al-Attar and Hussain, 2004). As pointed out by the Conceptual Framework of FASB (1978) and IASB (1989), cash flow prediction is the primary objective of financial reporting. The FASB and IASB state that current $EARN$ is a superior predictor of the $FCFO$ compared to current CFO. Since then, a sizeable body of empirical studies investigate the abilities of $EARN$ and CFO in predicting the $FCFO$. Chapter 2 presents the main findings in the literature regarding the role of $EARN$ and CFO in predicting the $FCFO$. The findings from the extant cash flow prediction studies show that there is a major contradiction in the results and there is no consensus on which cash flow prediction model has a superior predictive ability.

Chapter 2 shows that there has been a long debate about the superiority of $EARN$ over the CFO in predicting the $FCFO$. Some research studies find evidence that agrees with the FASB and IASB's assertion that $EARN$ is a superior predictor of the $FCFO$ compared to the CFO (Lorek and Willinger, 1996; Dechow *et al*., 1998; Kim and Kross, 2005; Ebaid, 2011; Arnedo *et al*., 2012), while others provide contradicting evidence by show that the CFO has a superior predictive ability (Finger, 1994; Farshadfar *et al*., 2008; Lorek and Willinger, 2009; Lev *et al*., 2010; Habib, 2010). Although the empirical findings are mixed with regards to whether $EARN$ or CFO is superior to predict the $FCFO$, these studies combined suggest that both are important determinants in predicting the $FCFO$.

These contrasting findings in the literature might be attributable to measurement error in estimating the CFO especially before the mandatory disclosure of the statement of cash flows as required by FASB (1987) and IASB (1992). Another possible explanation for the contrasting findings in the literature is the methodological differences (in-sample regression analysis versus out-of-sample prediction tests) most of the cash flow prediction studies use in-sample regression analysis which rely on the statistical correlation between the predictor, either $EARN$ or CFO, and the $FCFO$ to assess their predictive ability. However, Watts and Leftwich (1977) provide empirical evidence that goodness-of-fit such as the adjusted R-squared statistics might not be enough to identify the predictive ability. In contrast to in-sample regression analysis, out-of-sample tests using an inter-temporal holdout period not employed in model estimation to evaluate predictive ability (Lorek and Willinger, 2010). Then, out-of-sample tests compare between predicted and actual outcomes, and use superior prediction accuracy as the basis for model selection (Nam *et al*., 2012; Francis and Eason, 2012).

Therefore, studies have recently moved away from in-sample regression analyses and estimated CFO measures towards the investigation of the predictive ability of $EARN$ and CFO using out-of-sample prediction tests and CFO reported in the statement of cash flows. The results show that the CFO acts as a superior predictor of the $FCFO$ compared to $EARN$ (Lorek and Willinger, 2009; Lev *et al*., 2010).

Most of the research studies, until 21st century, examine the predictive ability of $EARN$ versus the CFO without disaggregating them to their components. Towards the beginning of the 21st century, the incremental information content within $EARN$ and CFO become an area of growing interest, resulting in an extension of more complex cash flow prediction models which include the disaggregated components of $EARN$, CFO and ACC rather than depending on aggregate predictors (De Ricquebourg, 2013).

Krishnan and Largay (2000) and Barth *et al.* (2001) present two of the first studies that develop these disaggregated models, while at the same time using reported rather than estimated CFO proxies. Both studies find that the disaggregated models markedly outperform models developed with aggregate $EARN$ or aggregate CFO in terms of predicting the $FCFO$. Further, Al-Attar and Hussain (2004), Ebaid (2011), Cheng and Hollie, (2008) and Orpurt and Zang (2009) confirm that prediction models include the components of CFO and ACC improve the prediction of the $FCFO$. To sum up, the aforementioned studies show that the predictive abilities of $EARN$, CFO and ACC are enhanced by disaggregating each one of them to their components.

In conclusion, the existing literature on cash flow prediction concentrate on the usefulness of $EARN$ and CFO as predictors of the $FCFO$. However, the results of previous studies on this topic are mixed. A possible reason for the mixed results is the higher level of subjectivity inherent in accrual estimates. The main purpose in using accrual accounting instead of cash flow accounting is that accrual accounting matches revenues and expenses better than cash flow accounting (Dechow, 1994). Therefore, the use of accruals should improve the assessment of a firm's current financial performance as well as improving predictions regarding its future performance, including future cash flows. However, the possibility of managing earnings by using accruals may reduce the information content of the earnings. This, in turn, leads to the second objective of this thesis.

Objective 2: Identifying the factors that might affect the predictive abilities of $EARN$, CFO and ACC.

Although there is substantial research testing the predictive abilities of $EARN$ and CFO (e.g., Dechow *et al*., 1998; Barth *et al*., 2001; Kim and Kross, 2005; Farshadfar *et al*., 2008; Lorek and Willinger, 2009; Lev *et al*., 2010), there is a dearth in studies that test the factors affecting the predictive ability of $EARN$ and its components, especially in the MENA region. In this regard, Chapter 3 highlights the factors that might affect the predictive ability of $EARN$ and its components.

$EARN$ is expected to provide a superior prediction of the $FCFO$ compared to CFO because it mitigates timing and mismatching problems inherent in the CFO (Dechow, 1994; Dechow *et al*., 1998). However, scholars and practitioners argue that the subjectivity embedded in accrual estimates introduce noise that can have a negative impact on the informational value of earnings (Dechow and Dichev (2002). Moreover, because of the flexibility of the GAAP or the IFRS, earnings and specifically accruals are subject to managerial discretion. There are two widely used accounting perspectives regarding managers' discretionary accounting choices, and each has different implications on the ability of $EARN$ to predict the $FCFO$: efficient or opportunistic (Subramanyam, 1996; Al-Attar *et al*., 2008; Farshadfar and Monem, 2011; Nam *et al*., 2012; Badertscher *et al*., 2012). On the one hand, discretionary accruals could enhance $EARN$'s informativeness by allowing managers to signal their private information, thereby providing ACC components that are superior predictors of the firm's future cash flows. On the other hand, discretionary accruals can be used opportunistically, and thereby adversely affect the quality of reported $EARN$ with regard to conveying information on future cash flows. To date, there is relatively scarce evidence (e.g., Subramanayam, 1996; Al-Attar *et al*., 2008; Farshadfar and

Monem, 2011; Nam *et al.*, 2012) on whether discretionary accruals are used to distort $EARN$'s informativeness or to convey useful information to investors.

Subramanyam (1996), Al-Attar *et al*. (2008) and Farshadfar and Monem (2011) support the efficient hypothesis and find that discretionary accruals add informational value to $EARN$ when predicting the $FCFO$. In contrast, Nam *et al*. (2012) find that the discretionary accruals do not add informational value to $EARN$ when predicting the $FCFO$. Thus, the net effect (i.e. efficient or opportunistic) of this managerial discretion remains an empirical question that is worth further analysis.

Even in the absence of intentional manipulation by managers, large accruals may be associated with a reduced quality of reported earnings due to increased unintentional measurement errors in managers' accrual estimates (Dechow and Dichev, 2002; Francis *et al*., 2005). Hence, whether these errors are made for manipulative purpose or in good faith, accruals can be misleading and not representative of firm future performance (Nam *et al*., 2012). Thus, it is important to understand whether and how discretionary accruals and unintentional managerial errors can impact the ability of $EARN$ and its components in predicting the one-year-ahead CFO. The effect of both types of accrual errors on the information content of earnings remains relatively unexplored, especially in the MENA region firms.

Recent literature notes that to meet certain financial reporting goals, managers can manipulate earnings not only through accruals, but also by altering real activities (Roychowdhury, 2006; Cohen and Zarowin, 2010; Zang, 2012). In contrast to the discretionary accruals, Roychowdhury argues that earnings management through real activities can manipulate both cash flows and accrual. However, most of the cash flow prediction studies assume that cash flows is free from manipulation. Therefore, earnings management can go beyond manipulating the accrual component of earnings only, but also it can manipulate the cash flow component.

Roychowdhury (2006) suggests that cash flows can be influenced by certain real activities manipulation. That is, acceleration of sales by providing price discount or lenient credit term which decrease cash flows; overproduction strategy which decrease cash flows; and reduction of discretionary expenditure, such as advertising expense and R&D expense, which increase cash flows. Therefore, this thesis aims to examine whether the manipulation of real activities in any given period gives rise to unpredictable patterns of cash flows in subsequent periods, making the process of predicting future cash flows difficult.

To sum up, the existing research on cash flow prediction focus only on how discretionary accruals can hinder the prediction process. Instead of examining only discretionary accruals, this thesis contributes to the literature by examining the impact of real earnings management on the predictive ability of $EARN$ and its components, which has received little attention to date. Therefore, one of the main aims of this thesis is to assess the relation between the predictive ability of $EARN$ (and its components) and errors and biases arising from the manipulation of discretionary accruals and real activities, and from unintentional managerial errors due to environmental uncertainty.

While, accounting standards offer broad discretion for earnings management, accounting conservatism is one of the accounting principles that discourage earnings management, and thus enhancing the credibility of firms' financial reports. Accounting conservatism refers to accountants' tendency to require a higher degree of verification to recognize good news as gains than to recognize bad news as losses (Basu 1997). This asymmetric verifiability requirement of conservative accounting policy offsets managers' tendencies to hide bad news and accelerate good news recognition in financial statements (Watts, 2003). Thus, it is expected that the more conservative a firm's accounting policy, the higher the ability of $EARN$ in predicting the $FCFO$.

Kim and Kross (2005) provide evidence that conservatism plays efficeint role when predicting the $FCFO$. They find that accounting conservatism has a significant positive relationship with the ability of $EARN$ to predict $FCFO$ in the US context. Further, Bandyopadhyay *et al*. (2010) support the results of Kim and Kross (2005), and find that accounting conservatism play role in enhancing the predictive ability of $EARN$. In reviewing the accounting literature, Chapter 3 suggests that discretionary accruals, real activities manipulation, unintentional managerial errors, and accounting conservatism can affect the predictive abilities of $EARN$, CFO and ACC with respect to the $FCFO$.

Objective 3: Analyse the abilities of current $EARN$, CFO and ACC, and their disaggregated components in predicting one-year-ahead CFO in the MENA region firms.

To address this research objective, Chapter 5 analyses a sample of 4,556 firm-year observations related to 853 MENA region firms over the 2005–2018 period. Thus, this thesis contributes to the growing literature on cash flow prediction by analyzing the predictive ability of different models in the MENA region which suffers from a significant dearth in studies testing the cash flow prediction models. In Chapter 5, six prediction models are examined to identify which of these models provides superior prediction of the one-year-ahead CFO in the MENA region firms. The six prediction models are estimated by regressing the one-year-ahead CFO on: (i) current aggregate $EARN$; (ii) current aggregate CFO ; (iii) current aggregate CFO and total ACC ; (iv) current aggregate CFO and disaggregated ACC components ; (v) current disaggregated CFO into the DM components of the statement of cash flows ; and (vi) current disaggregated CFO into the DM components with disaggregated ACC components. The prediction performance of these models is assessed using: (i) in-sample regression analysis based on comparing the adjusted R-squared statistics of the six prediction models; and (ii) out-of-sample prediction tests based on comparing the mean and median of the absolute prediction errors of the models.

The in-sample regression analysis is conducted through estimating the model parameters by the traditional PRM, consistent with the prior studies, and then are re-examined within a more sophisticated regression approach called the FEM, which allows intercepts to vary across firms. The AIC and BIC metrics are also employed to evaluate the fit of a regression model while penalising the addition of increasingly large number of independent variables. Moreover, bootstrapping is used to measure whether the differences between the adjusted R-squared statistics and the absolute prediction error of different models are significant.

The PRM shows that that there is insignificant difference between the ability of current aggregate $EARN$ and the current CFO in predicting the one-year-ahead CFO, while the FEM indicates that current aggregate $EARN$ outperforms the current CFO in predicting one-year-ahead CFO. However, the results of the PRM and the FEM provide major conclusion that there are significant gains to the disaggregation of $EARN$ into the CFO and ACC components as suggested by Barth *et al*. (2001) and disaggregation of the CFO into the DM components when predicting the one-year-ahead CFO in the MENA region firms. The results reveal that all the models with the disaggregated components have a higher adjusted R-squared statistics than models with aggregate variables (i.e., $EARN$ model and CFO model). These results are to a great extent consistent with the prior studies (e.g., Krishnan and Largay, 2000; Barth *et al*., 2001; Al-Attar and Hussain, 2004; Orpurt and Zang, 2009; Farshadfar and Monem, 2013b), and to a great extent as expected in the research hypotheses.

However, the out-of-sample analysis does not support the argument that disaggregating $EARN$, CFO or ACC into their individual components can provide superior prediction of the one-year-ahead CFO. Consistent with the in-sample regression analysis, the out-of-sample prediction tests do not provide a clear answer of which from $EARN$ or CFO provides superior prediction of the one-year-aheadCFO in the MENA region firms.

To sum up, although the results of the in-sample regression analysis show that the explanatory powers of the six prediction models are improved when $EARN$, CFO and ACC are disaggregated, this does not mean that out-of-sample prediction errors are similarly improved. Therefore, superiority in goodness of fit (e.g., adjusted R-squared statistics) does not necessarily translate into superiority in predictive ability, consistent with Watts and Leftwich (1977). These differences in predictive assessment between in-sample regression analysis and out-of-sample prediction test emphasise the importance of employing out-of-sample tests to assess the performance of different prediction models.

Further, to account for the differences between the GCC and non-GCC country firms, a further analysis is conducted. The results of GCC and non-GCC country firms are to a great extent consistent with the findings of the MENA region firms. The only difference is that the predictive ability of $EARN$ is superior compared to CFO in non-GCC country firms, under the in-sample regression analysis. This result might be due to the differences in the accounting standards applied in each region, the GCC firms are IFRS oriented, while the non-GCC firms are domestic GAAP oriented.

Objective 4: Identify which model has the superior ability to predict the one-year-ahead CFO in the MENA region firms.

In Chapter 5, the in-sample regression analysis, either through the PRM or the FEM, shows that the model with the significantly highest adjusted R-squared statistic in the MENA region firms is the full disaggregation model which contains all components of both CFO and ACC. However, the out-of-sample prediction tests show that disaggregation does not necessarily lead to superior prediction of the future cash flows. Specifically, except for disaggregating $EARN$ into CFO and total ACC, neither the prediction derived from the full disaggregation model, nor the two prediction models based on the disaggregated CFO

components or the disaggregated ACC components outperform the prediction models based on aggregate CFO or aggregate $EARN$. Thus, the out-of-sample results indicate that the best prediction model is the one contains CFO and total ACC.

Objective 5: Determine whether earnings management and unintentional managerial errors have a significant effect on the ability of current $EARN$ and its components to predict the one-year-ahead CFO in the MENA region firms.

Existing literature only examines the effect of discretionary accruals on the performance of cash flow prediction models, while this thesis aims to fill the gap by examining the impact of earnings management, more precisely, accrual-based and real earnings management on the ability of $EARN$ and its components in predicting the one-year-ahead CFO. In this respect, this thesis allows for a broader and more comprehensive understanding of the possible effects of earnings management along with unintentional managerial errors on the CFO prediction process.

Therefore, Chapter 6 accomplishes this task by examining the effect of discretionary accruals, real earnings management and unintentional managerial errors on the predictive ability of $EARN$ and its components. Finally, this thesis also considers whether the determinants of unintentional managerial errors which are proxied by five firm-specific characteristics; firm size, cash flow volatility, sales volatility, firm operating cycle length, and frequency of reporting negative $EARN$ as suggested by Dechow and Dichev (2002) and Francis *et al*. (2005), can affect the predictive ability of $EARN$ and its components.

Using a sample of 2,360 firm-year observations related to 853 MENA region firms over ten-year period from 2008–2017, the results support the research expectations and find that discretionary accruals, real earnings management and unintentional managerial errors have a significant negative effect on the ability of $EARN$ and its components in predicting the one-year-ahead CFO. Specifically, the findings of this thesis show that unintentional managerial errors are likely to have the dominant effect on the cash-based and earnings-based prediction models compared to the two earnings management approaches. This might be due to the observation that the mismeasurement in estimating accruals is more common in financial reporting compared to intentional earnings management that might occur only occasionally (Dechow and Dichev, 2002; Taylor and Xu, 2010).

Therefore, this thesis contributes to the cash flow prediction literature by showing that even in the absence of managerial discretion in accruals, the predictive ability of $EARN$ and its components is likely to be related to observable and recurring firm characteristics that are considered as proxy for the unintentional managerial errors (e.g., firm size, operational volatility, operating cycle length and frequency of reporting losses). All of these firm characteristics together are associated with higher incidence of unavoidable and inaccurate estimation errors in accruals due to the inherent difficulty in accruals estimation, which, in turn, affects negatively the ability of $EARN$ and its components when predicting the $FCFO$.

This thesis provides another contribution to the cash flow prediction literature by providing an evidence that both managers' discretion regarding accounting choices and managers 'decisions to alter operational activities have negative effects on the predictive ability of $EARN$ and its components. One interpretation of the negative consequences of both earnings management approaches on the predictive ability of $EARN$ and its components is that the firms in the MENA region countries might engage intensively in opportunistic earnings management which produces noisy earnings estimation.

Further, the results find that the predictive ability of $EARN$ and its components is a function of certain firm-specific characteristics. The findings reveal that firms with relatively shorter operating cycles exhibit more accurate cash flow predictions in comparison with firms with longer operating cycles. The predictive abilities of $EARN$ and CFO are better for firms characterised by low cash flow variability, while the incremental contribution of ACC over CFO in improving the prediction of the one-year-ahead CFO is high for firms with a higher incidence of negative $EARN$ realizations. This empirical evidence supports the role of ACC in predicting the one-year-ahead CFO because it conveys useful information regarding the $FCFO$ beyond current CFO alone.

Objective 6: Determine whether accounting conservatism has a significant effect on the ability of current $EARN$ and its components to predict one-year-ahead CFO in the MENA region firms.

Despite the large literature on accounting conservatism, few studies have examined its impact on the abilities of $EARN$ and ACC in predicting the one-year-ahead CFO. Thus, Chapter 7 extends prior studies that investigate the accounting conservatism and cash flow predictability through examining its impact, either conditional or unconditional, on the ability of $EARN$ and contribution of ACC in predicting the one-year-ahead CFO in the MENA region firms.

Using a sample of 1,815 firm-year observations related to 853 MENA region firms over 11-year period from 2008–2018, the results suggest that accounting conservatism in general (no matter conditional or unconditional conservatism) is not associated with the ability of $EARN$ in predicting the one-year-ahead CFO in the MENA region firms. Further, to account for the differences between the GCC and non-GCC country firms, further analysis is undertaken to separate between these two areas, the results show that the unconditional conservatism still has no impact on the predictive ability of $EARN$ in both regions. This might be attributed to the fact that the opportunistic earnings management practices are more prevalent in the MENA region than unconditional conservatism practices.

However, the results show considerable confusion over conditional conservatism when running a separate regression for each of the GCC and non-GCC country firms. Chapter 7 shows that conditional conservatism is negatively related to predictive ability of $EARN$ in the GCC country firms but positively related to predictive ability of $EARN$ in the non-GCC country firms. This unexpected result about the negative relation between conditional conservatism and the predictive ability of $EARN$ can be attributed to the fact that the GCC countries are more IFRS-oriented. The results of this thesis show that conditional conservatism pre-IFRS is significantly higher than post-IFRS which is consistent with the IFRS orientation towards fair value accounting rather than conservative accounting. Under fair value accounting, managers have the opportunity to manipulate fair values for opportunistic purposes (Ramanna &Watts, 2012), which adversely affect the information content of reported earnings, making them less predictive of future cash flows.

Turning to the effect of accounting conservatism on ACC contribution upon CFO in the prediction of one-year-ahead CFO, the results show that conditional conservatism has no effect on the ACC contribution in the GCC, non-GCC and MENA region firms. However, the regression results provide consistent evidence that unconditional conservatism enhances the ACC contribution over the CFO in predicting the one-year-ahead CFO in the GCC and MENA region firms, consistent with research expectations.

8.3 Research Limitations

The results of this thesis are subject to some caveats. First, this thesis examines ten countries in the MENA region which have different sets of accounting standards either the IFRS or the domestic GAAP. While the main objective of financial reporting is to provide information to interest groups of firms regarding future cash flows, the differences in legal systems, shareholder protection, capital market orientation and relationship between financial reporting rules and taxation across countries may substantially affect the abilities of $EARN$, CFO and ACC to predict the $FCFO$. Thus, testing these countries together in the same regression analysis might mask the real predictive abilities of $EARN$, CFO and ACC for each country. However, the missing data problem in the MENA region makes analysing each country alone problematic. To partially overcome this problem, this thesis runs a separate regression analysis for the GCC and non-GCC country firms.

Second, the missing data problem also results in having a relatively small sample compared to previous studies. Thus, the smaller sample size might substantially affect the empirical results of this thesis. Third, the thesis includes only the firms of developing countries in the MENA region, so the results of this thesis may not be generalisable to firms in the developed countries. Fourth, the sample period used in this thesis (2004-2018) includes two major events, i.e., the Global Financial Crisis of 2008-2009 as well as the Arab spring of 2011. Although, these two major events affect the performance of many firms in the MENA region negatively, it is hard to isolate the effect of these severe economic downturns in the analysis of cash flow prediction models in this thesis.

Fifth, the power of the tests may be weak because of survivorship bias as to calculate the absolute prediction error, earnings management, unintentional managerial errors and conditional conservatism each model of them must have at least eight observations for every year and industry. In addition, to ensure comparability between models, the data used in all models must be similar which may lead to losing many observations due to data availability.

Sixth, this thesis use current variables to predict only the one-year-ahead CFO, hence, the prediction horizon is limited. Therefore, future research needs to examine the sensitivity of the cash flow prediction models across longer horizons, especially in the developing countries. Finger (1994) examines the cash flow prediction models using short and long time horizons. She finds that CFO provides more accurate prediction of the $FCFO$ for short time horizon, whereas $EARN$ and CFO have the same predictive ability for longer time horizon. Therefore, it is expected that a longer prediction horizon can lead to different results concerning the superiority of one cash flow prediction model over another.

Finally, an important limitation of this thesis and most of the prior literature is that some of the variables used in this thesis are difficult to measure and hence, the results are subject to measurement error problems and model misspecification. First, the $ABSE$, used in evaluating predictions and used in determining whether earnings management, unintentional managerial errors and accounting conservatism affect the predictive ability of $EARN$ and its components, is estimated and thus this may lead to error-in-variable bias. Second, the DM components of the statement of cash flows is not estimable from other financial statement information without measurement error that is often material. This is significant because prior studies (e.g., Krishnan and Largay, 2000; Orpurt and Zang, 2009) provide evidence of material measurement errors when estimating the DM components. More importantly, Orpurt and Zang (2009) find that the association between estimated DM components and the $FCFO$ is affected by the degree of these measurement errors.

Third, there is still doubt regarding the ability of the modified Dechow and Dichev model to reliably capture the quality of accruals. The findings of Wysocki (2009) show that this model has a limited ability to differentiate between manipulated and high quality accruals, and there is possibility that this model cannot empirically distinguish between the discretionary and non-discretionary accruals. Moreover, the real earnings management identification techniques employed in this thesis may be subject to the same criticism as regression-based discretionary accruals technique (Doukakis, 2014). There is a difficulty in distinguishing between real earnings manipulation and optimal business decisions (Gunny, 2010). Thus, one of the common criticisms in the accounting literature is that any earnings management identified may be a result of an omitted variable or may be capturing behaviour other than intentional manipulation (Gunny, 2010).

Despite the weaknesses of the measures of accruals quality and real earnings management used in this thesis, they are commonly used in recent earnings management literature, and appear to be satisfactory measures of intentional earnings management and unintentional managerial errors (Cohen *et al*. 2008; Gray *et al*., 2009; Kent *et al*., 2010; Cohen and Zarowin, 2010; Zang, 2012).

8.4 Research Implications

Cash flow prediction is one of the essential inputs for a wide variety of economic decisions taken by accounting information users such as investors and creditors (Al-Attar and Hussain, 2004; Chotkunakitti, 2005; Lev *et al*., 2010; Francis and Eason, 2012). Specifically, it plays an essential role in decisions related to assessing the liquidity, solvency and financial flexibility (Kieso *et al*., 2010). Furthermore, one of the main targets of firms nowadays is to determine the optimum level of cash to hold as even if firms are achieving profits, if they run out of cash, they might be subject to insolvency problems (Keown, Martin, Petty and Scott, 2005; Tutor2u, 2020). This, in turn, requires managers to keep an eye on the level of cash they have and try to predict any cash flow crises that might occur to be able to take corrective actions. As there is no reasonable excuse that managers can have if they failed to predict such crises.

Consequently, managers nowadays focus on predicting future cash flows to make sure that the business has enough to survive. Thus, cash flow prediction is an early warning system because it identifies the potential shortfalls in cash balances in advance, which is the most important reason for a cash flow prediction (Tutor2u, 2020). This, in turn, leads to a substantial amount of research in accounting literature testing cash flow prediction models and their accuracy. However, most of these studies focus on developed countries and there is a substantial gap in research studies testing cash flow prediction models in developing countries generally and the MENA region specifically.

Thus, to respond to this gap, this thesis provides the accounting users in the MENA region with the prediction models that can provide more accurate forecast of the $FCFO$. To identify the best model for the MENA region, this thesis uses a variety of models that are widely used in accounting research. The results of the out-of-sample prediction tests show that the accounting users in the MENA region should use aggregate variables of $EARN$, CFO or ACC to predict the $FCFO$ rather than disaggregating them into their components. Although these results are inconsistent with the results of Barth *et al.* (2001) and Krishnan and Largay (2000), they show that models applied in developed countries cannot be used directly in developing countries that have different accounting standards, and different financial, economic and political conditions. This, in turn, necessitates testing the model thoroughly before using them in predictions.

Consequently, the results of this thesis help several accounting information users in generating accurate cash flow predictions. These accurate cash flow predictions help the managers in decision making process. On the one hand, if the cash flow prediction gives an indication that the firm is going to run out of cash, the managers should find way to overcome this issue by cutting overheads, finding new investment, or spending time generating more sales. On the other hand, if the firm is doing well, the managers should consider expanding into new markets, investing in new products, taking on bigger premises, or recruiting new staff (PricewaterhouseCoopers, 2020). Furthermore, cash flow predictions models are also required by banks that grant loans to the company at regular intervals to ensure that the firm is able to repay the loan and the interest on time and without any problems (Tutor2u, 2020).

In addition, by analysing the effect of earnings management and accounting conservatism on the accuracy of cash flow prediction models, several implications can be derived. First, the thesis highlights that earnings management practices in the MENA region are mainly opportunistic rather than efficient. This, in turn, should raise the awareness of creditors, investors, analysts, and auditors that the earnings management behaviour of firms in the MENA region does not improve the informativeness of firm earnings, and does not provide any benefits to cash flow prediction process, yet it is considered a detrimental practice for cash flow prediction process. Thus, the organizational bodies involved in the regulation of the accountancy profession in each of the MENA region countries investigated in this thesis should develop more strict rules and regulations to ensure that the accounting standards are applied efficiently in preparing the financial statements.

Second, although the results show that conservatism does not have a strong impact on the accuracy of cash flow prediction models in the MENA region firms, the further in-depth analysis undertaken on the GCC countries and the non-GCC countries separately show that conservatism improves the accuracy of cash flow predictions in the non-GCC countries, while it affects negatively the accuracy of these prediction in the GCC countries. These inconsistent results about effect of conservatism may be attributed to the different accounting standards employed in each area. Specifically, the majority of GCC countries apply the IFRS while the majority of the non-GCC countries are still conforming to the domestic GAAP which is to a great extent similar to the US GAAP.

In this regard, the results of this thesis highlight the differences between the GAAP and the IFRS and the impact of these differences on the accuracy and informativness of accounting data. Specifically, although the IFRS calls for more flexibility in preparing financial statements which may be seen as an advantage as it simplifies the process of preparing the financial reports, the results of this thesis show that this flexibility leads to more opportunistic earnings management practices rather than being conservative which might negatively impact the quality of accounting information. Furthermore, the results of this thesis contribute to the debate between standard-setters on the importance of accounting conservatism as a principle. Specifically, the results highlight the role of accounting conservatism in improving the accuracy of cash flow prediction models which is one of the main goals of financial reporting (IASB, 2018).

Thus, the results of this thesis are important for standard-setters as it contributes towards the debate on whether accounting conservatism should be eliminated from the accounting standards as it might bias accounting information or it should be kept as it improves the accuracy of accounting information. Consistent with the results of previous literature about the importance of accounting conservatism (e.g., Barker and Mcgeachin, 2015; André *et al.*, 2015), this thesis also supports the decision of the IASB to reintroduce the accounting conservatism in the IASB Conceptual Framework.

8.5 Recommendation for Future Research

This thesis raises a number of interesting extensions for future research. The first concern is to examine the relative benefits and costs of the IFRS adoption on the ability of current $EARN$ and its components to predict the $FCFO$. The movement toward applying the IFRS in many countries generates considerable attention and debate. The IASB becomes the global standard-setter, thus examining this issue is potentially relevant for firms around the world that adapted or willing to adapt to the IFRS. Given the significant changes made to financial reporting with the introduction of IFRS, thus examining the impact of these new standards on the predictive ability of $EARN$ and its components is important.

The aim of the IASB is to develop an internationally acceptable set of high quality financial reporting standards (Barth, Landsman and Lang, 2008). To achieve this goal, the IASB has issued principles-based standards, and taken steps to remove allowable accounting alternatives and to require accounting measurements that better reflect a firm's economic position and performance. Financial reporting quality could increase if these actions by standard setters limit management's opportunistic discretion in determining accounting amounts (Barth *et al*., 2008; Doukakis, 2014). If so, the IFRS could be of higher quality than the US GAAP or domestic GAAP; however, these predictions may not be achieved (Barth *et al*., 2008; Doukakis, 2014). Both studies argue that the inherent flexibility allowed under the IFRS may even provide greater opportunity for firms to manage earnings, thereby decreasing accounting quality.

Atwood *et al*. (2011) argue that if managers use the increased reporting flexibility under IFRS to convey private information, $EARN$ reported under the IFRS may be more closely associated with the $FCFO$ than $EARN$ reported under the US GAAP. However, if managers use their discretion to report $EARN$ opportunistically, $EARN$ reported under the IFRS may be less closely associated with the $FCFO$ than $EARN$ reported under the US GAAP. Therefore, if the flexibility inherent in the IFRS do not contribute significantly to the usefulness of financial information, then the efforts of accounting standard-setters devote to improve the process of financial statement preparation are misdirected. Therefore, these arguments suggest that the impact of the IFRS adoption on the predictive ability of $EARN$ and its components is an open empirical issue that needs further investigation.

Atwood *et al*. (2011) examine the association between current $EARN$ and the $FCFO$ for firms reporting under the IFRS versus firms reporting under the US GAAP. They find that $EARN$ reported under the IFRS are less closely associated with the $FCFO$ than are $EARN$ reported under the US GAAP. Further, this thesis also suggests, as shown in Chapter 5, that $EARN$ reported under the domestic GAAP in the non-GCC countries have higher predictive ability than the CFO in these countries, while $EARN$ and CFO reported under the IFRS in the GCC countries have the same predictive ability. Although, the IFRS and the GAAP (either the US GAAP or domestic GAAP) are both high quality sets of accounting standards, it seems that the GAAP generates $EARN$ that is better with respect to the prediction of $FCFO$ than the IFRS. This evidence is consistent with the claim that the variation in accounting standards impacts the predictive ability of $EARN$ and its components. However, it is still unclear how changing accounting policies, as implied by the IASB adoption, impacts the ability of $EARN$ and its components to accurately predict the $FCFO$.

Moreover, this thesis suggests that differences in the cash classification choices available under the IFRS and domestic GAAP have different implications on the ability of CFO in predicting the one-year-ahead CFO as shown in Chapter 5. The IFRS supports flexibility in classifying interest and tax paid as well as interest received to operating, investing, or financing activities within the statement of cash flows. In contrast, the GAAP requires these items to be classified as operating cash flows. As a consequence, the CFO is measured differently under the IFRS and the GAAP (either the US GAAP or the domestic GAAP) because of classification alternatives available under the IFRS. Overall, the consequences of cash flow classification choices under the IFRS on the predictive ability of the CFO offer an avenue for future research.

Theoretically, the appropriate classification of the CFO components in the statement of cash flows might enhance the predictive ability of CFO, especially for the firms that are IFRS-oriented. Therefore, this thesis raises a question of whether or not the flexibility in classification choices within the statement of cash flows under the IFRS impacts the performance of current CFO in predicting the $FCFO$. The effect of the differences in the CFO classification choices and its consequences matter because both the IASB and the FASB share the same objective that financial information should provide information helpful to financial statement users to better predict future cash flows.

Although this thesis has some valuable contributions to understand the impact of different forms of accounting conservatism on the abilities of $EARN$ and ACC in predicting the one-year-ahead CFO, still this areas warrants further research. The impact of accounting conservatism on the performance of cash flow prediction models has been largely ignored in the literature, although it is highly relevant for practitioners, regulators and academics. Therefore, more work is needed to examine the impact of either conditional or unconditional conservatism on the performance of cash flow prediction models.

Examining the role of accounting conservatism also contributes to the ongoing debates regarding the benefits, costs and continuing role of accounting conservatism as a central tenet of financial accounting. The FASB and IASB removed conservatism from their Conceptual Framework because it contradicts with the principle of neutrality. Recently a significant number of studies in the literature offers a support for accounting conservatism (Barker and Mcgeachin, 2015), thus the IASB reintroduced it in its Conceptual Framework in 2018.

Moreover, the possible convergence from the GAAP (either the US GAAP or the domestic GAAP) to the IFRS would have a major impact on accounting conservatism. Many questions have not yet been addressed about the implications of this convergence. Currently, there has been little or no research on the differences in accounting conservatism between the GAAP and the IFRS. This would incorporate a future stream of literature documenting that reporting items likely to reflect conservative accounting under the IFRS (e.g., goodwill impairment) also reflect incentives by agents to bias reported amounts (e.g., McVay 2006; André *et al*., 2015). Therefore, it remains an open empirical question as to whether and how the new trend in accounting conservatism under the IFRS can impact the abilities of $EARN$ and ACC to predict the $FCFO$.

Finally, this thesis shows that the predictive ability of $EARN$ and its components is highly sensitive to earnings management, unintentional managerial errors, accounting conservatism and firm specific characteristics (e.g., cash flow volatility and operating cycle length). This thesis calls for additional research to identify other firm characteristics and institutional differences that may help explain the variability in the predictive ability of $EARN$ and its components such as industry membership and corporate governance.

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Appendix

Appendix A: The In-Sample Regression Analysis and Out-of-Sample Prediction Tests of GCC and Non-GCC Country Firms

Table A.1: Cash Flow Prediction Models: Pooled Regression Model Analysis of the GCC and Non-GCC Country Firms

	Model 1		**Model 2**		**Model 3**		**Model 4**		**Model 5**		**Model 6**	
	GCC	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**
Adjusted R-squared	0.33	0.24	0.36	0.16	0.42	0.26	0.46	0.30	0.39	0.20	0.47	0.31
F-statistics	925.78***	389.28***	893.67***	253.93***	717.83***	242.34***	338.03***	105.75***	206.92***	61.22***	208.54***	60.98***
AIC	-6616.59	-4034.76	-6754.28	--3863.05	-7000.46	-4090.791	-7224.35	-4181.41	-6866.71	-3933.65	-7273.68	-4185.58
BIC	-6604.77	-4023.75	-6742.45	-3852.03	-6982.72	-4074.265	-7182.96	-4142.85	-6825.32	-3895.09	-7202.73	-4150.47
Maximum VIF	1.0	1.0	1.0	1.0	1.41	1.46	1.46	1.70	30.72	30.69	43.08	44.09
Mean VIF	1.0	1.0	1.0	1.0	1.41	1.46	1.34	1.42	10.97	11.11	8.91	9.25
Predictors [expected sign of coefficient]	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**
$\boldsymbol{EARN_t}$ [+]	0.651*** (30.43)	0.570*** (19.73)										
$\boldsymbol{CFO_t}$ [+]			0.599*** (29.89)	0.418*** (15.94)	0.748*** (37.68)	0.639*** (22.00)	0.713*** (35.84)	0.602 (24.13)				
$\boldsymbol{ACC_t}$ [+/-]					0.355*** (12.01)	0.446*** (12.38)						
$\boldsymbol{\Delta A/R_t}$[+]							0.493*** (11.72)	0.473*** (13.12)			0.482*** (11.66)	0.454*** (9.61)
$\boldsymbol{\Delta INV_t}$[+]							0.510*** (8.89)	0.457*** (11.03)			0.458*** (8.08)	0.423*** (8.39)
$\boldsymbol{\Delta A/P_t}$[-]							-0.527*** (-9.25)	-0.656*** (-13.40)			-0.515*** (-9.26)	-0.633*** (-10.90)
$\boldsymbol{DEP_t}$[+]							0.371*** (6.42)	0.265*** (3.19)			0.324*** (5.52)	0.219*** (2.56)
$\boldsymbol{ACCOTHERS_t}$ [+/-]							0.319*** (8.21)	0.477*** (13.82)			0.301*** (7.96)	0.442*** (9.80)
$\boldsymbol{CSHRD_t}$[+]									0.642*** (30.89)	0.443*** (15.61)	0.747*** (35.83)	0.603*** (19.23)
$\boldsymbol{CSHPD_t}$ [-]									-0.626*** (-28.24)	-0.418*** (-14.14)	-0.742*** (34.11)	-0.595*** (-18.30)
$\boldsymbol{CSHTAX_t}$[-]									-0.411 (-1.23)	0.068 (0.23)	-0.761*** (-2.54)	-0.617*** (-2.24)
$\boldsymbol{CSHINTIN_t}$ [+]									1.384** (2.13)	3.093*** (2.94)	1.084* (1.78)	2.320** (2.48)

$\boldsymbol{CSHINTPD_t}$ **[-]**									-0.561*** (-3.00)	-0.680** (-2.13)	-0.588*** (-3.16)	-0.507*** (-1.61)
$\boldsymbol{CSHOTHERS_t}$ **[+/-]**									0.499*** (20.94)	0.323*** (10.55)	0.647*** (27.56)	0.560*** (16.31)
Constant	0.046*** 25.64	0.040*** (19.69)	0.032*** (13.75)	0.034*** (13.85)	0.029*** (13.45)	0.033*** (14.41)	0.004 (1.46)	0.014*** (4.47)	0.019*** (7.1)	0.014*** (4.05)	-0.001 (-0.2)	0.009*** (2.48)

This table presents regression summary statistics of estimation, using the PRM for the following six prediction models in the GCC and non-GCC country firms:

Model 1: $CFO_{it+1} = \beta_0 + \beta_1 EARN_{it} + \varepsilon_{it+1}$

Model 2: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it+1}$

Model 3: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 ACC_{it} + \varepsilon_{it+1}$

Model 4: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 \Delta A/R_{it} + \beta_3 \Delta INV_{it} + \beta_4 \Delta A/P_{it} + \beta_5 DEP_{it} + \beta_6 ACCOTHERS_{it} + \varepsilon_{it+1}$

Model 5: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4\, CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \varepsilon_{it+1}$

Model 6: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4\, CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \beta_7 \Delta A/R_{it} + \beta_8 \Delta INV_{it} + \beta_9 \Delta A/P_{it} + \beta_{10} DEP_{it}\ \beta_{11} ACCOTHERS_{it} + \varepsilon_{it+1}$

T-statistics for all slopes calculated using White (1980) robust standard errors. VIF is an indicator for multicollinearity where values exceed 10. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Variables definitions: CFO is net cash flows from operating activities as reported in the statement of cash flows. $EARN$ is net (after tax) earnings before extraordinary items and discontinued operations. ACC is difference between $EARN$ and CFO. $\Delta A/R$ is the change in accounts receivable during a year. ΔINV is the change in inventory during a year. $\Delta A/P$ is the change in accounts payable during a year. DEP is depreciation and amortization. $ACCOTHERS$ is other accruals calculated as follows $EARN - (CFO + \Delta A/R + \Delta INV - \Delta A/P - DEP)$. $CSHRD$ is estimated cash received from customers and calculated as follows $CSHRD = SALES - \Delta A/R$. $CSHPD$ is estimated cash paid to suppliers and employees and calculated as follows $CSHPD = COGS - DEP + Selling\ and\ Admin\ Expenses + \Delta INV - \Delta A/P + \Delta other\ CA - \Delta other\ CL$. $CSHTAX$ is disclosed cash related to tax payments. $CSHINTIN$ is disclosed cash related to interest income. $CSHINTPD$ is disclosed cash related to interest payments. $CSHOTHERS$ is other operating cash flows calculated as $CFO - (CSHRD - CSHPD - CSHTAX + CSHINTIN - CSHINTPD)$. All the variables are scaled by average total assets. The sample spans 14 years from 2005 to 2018. All variables are trimmed at the 1 percent and 99 percent levels. Number of observations of GCC country firms = 2,732. Number of observations of non-GCC country firms = 1,824. GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Non-GCC countries include Egypt, Jordan, Morocco, and Tunisia.

Table A.2: Bootstrap the difference of the Adjusted R-squared Statistics of the PRM for the GCC and Non-GCC Country Firms

	GCC Country Firms			Non-GCC Country Firms		
	Coefficient	**z-value**	**p-value**	**Coefficient**	**z-value**	**p-value**
Model 1 vs. Model 2	-0.033	-1.06	0.109	0.075***	3.71	0.000
Model 3 vs. Model 1	0.088***	6.91	0.806	0.023***	3.36	0.001
Model 3 vs. Model 2	0.055***	6.18	0.000	0.099***	6.56	0.000
Model 4 vs. Model 1	0.135***	10.30	0.000	0.061***	6.08	0.000
Model 4 vs. Model 3	0.047***	6.66	0.000	0.037***	4.58	0.000
Model 5 vs. Model 2	0.027***	4.21	0.000	0.034***	3.58	0.000
Model 6 vs. Model 1	0.145***	10.79	0.000	0.063***	6.11	0.000
Model 6 vs. Model 2	0.112***	9.26	0.000	0.145***	7.98	0.000
Model 6 vs. Model 3	0.057***	7.16	0.000	0.045***	4.59	0.000
Model 6 vs. Model 4	0.011***	2.78	0.000	0.005	0.71	0.476
Model 6 vs. Model 5	0.086***	8.22	0.000	0.105***	6.90	0.000

This table reports bootstrapping the difference of the adjusted R-squared statistics of the PRM for the GCC and non-GCC country firms. The table shows the difference between the adjusted R-squared statistic of a model versus another (coefficient) and the bootstrap z-values of this difference and p-values estimated from the empirical distribution of the bootstrapped z-values. The number of bootstrap replications is 1000. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.3: Cash Flow Prediction Models: Fixed Effect Model Analysis of the GCC and Non-GCC Country Firms

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	GCC	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**	**GCC**	**Non-GCC**
Adjusted R-squared	0.51	0.37	0.49	0.36	0.52	0.38	0.53	0.38	0.52	0.36%	0.54	0.39
Hausman Test	161***	122***	878***	908***	803***	655***	619***	515***	808***	1106***	935***	568***
F-statistics	85.95***	22.18***	25.39***	2.40	46.53***	17.53***	22.21***	7.28***	20.62***	2.49**	18.96***	5.24***
AIC	-7888.18	-4730.78	-7768.93	-4686.58	-7894.05	-4751.33	-7961.79	-4756.40	-7925.13	-4698.48	-8061.13	-4762.98
BIC	-7876.36	-4719.77	-7757.10	-4675.56	-7876.31	--4734.80	-7920.40	-4717.84	-7883.74	-4659.92	-7990.18	-4696.88
Predictors [expected Sign of coefficient]	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**	**Coeff. (t-statistics)**
$EARN_t$ [+]	0.309*** (9.27)	0.226*** (4.71)										
CFO_t [+]			0.150*** (5.04)	-0.054 (-1.55)	0.339*** 9.37	0.156*** (2.97)	0.348*** (9.81)	0.165*** (3.14)				
ACC_t [+/-]					0.281*** 7.55	0.278*** (5.54)						
$\Delta A/R_t$[+]							0.381*** (8.12)	0.295*** (5.11)			0.356*** (7.99)	0.300*** (5.08)
ΔINV_t[+]							0.339*** (5.41)	0.258*** (4.36)			0.211*** (3.47)	0.247*** (3.93)
$\Delta A/P_t$[-]							-0.353*** (-6.39)	-0.376*** (-5.60)			-0.287*** (-5.35)	-0.368*** (-5.22)
DEP_t[+]							0.381*** (2.48)	0.143 (0.71)			0.190 (1.20)	0.121 (0.6)
$ACCOTHERS_t$ [+/-]							0.204*** (4.90)	0.297*** (5.24)			0.145*** (3.66)	0.295*** (4.89)
$CSHRD_t$[+]									0.205*** (6.82)	-0.028 (-0.71)	0.366*** (10.6)	0.181*** (3.33)
$CSHPD_t$ [-]									-0.105*** (-3.12)	-0.065* (-1.68)	-0.289*** (-7.48)	-0.166*** (-2.83)
$CSHTAX_t$[-]									-1.223*** (-2.74)	-0.877 (-2.30)	-1.183*** (-2.74)	-1.213*** (-3.19)
$CSHINTIN_t$									0.035	2.964	-0.490	2.876

[+]									(0.03)	(1.57)	(-0.49)	(1.64)
$\boldsymbol{CSHINTPD_t}$ **[-]**									-0.149 (-0.54)	0.429 (1.05)	-0.182 (-0.66)	0.463 (1.11)
$\boldsymbol{CSHOTHERS_t}$ **[+/-]**									0.053* (1.66)	-0.076** (-2.07)	0.228*** (5.92)	0.150*** (2.61)
Constant	0.067*** (29.03)	0.051*** (22.66)	0.072*** (23.58)	0.061*** (22.42)	0.064*** (20.83)	0.056*** (20.12)	0.037*** (5.83)	0.043*** (6.60)	0.021*** (2.79)	0.039*** (4.01)	0.007 (0.85)	0.034*** (3.33)

This table presents regression summary statistics of the re-estimations of the following six prediction models, using the FEM in the GCC and non-GCC country firms, where FE variable is firm:

Model 1 : $CFO_{it+1} = \beta_0 + \beta_1 EARN_{it} + \varepsilon_{it+1}$

Model 2: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \varepsilon_{it+1}$

Model 3: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 ACC_{it} + \varepsilon_{it+1}$

Model 4: $CFO_{it+1} = \beta_0 + \beta_1 CFO_{it} + \beta_2 \Delta A/R_{it} + \beta_3 \Delta INV_{it} + \beta_4 \Delta A/P_{it} + \beta_5 DEP_{it} + \beta_6 ACCOTHERS_{it} + \varepsilon_{it+1}$

Model 5: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4\, CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \varepsilon_{it+1}$

Model 6: $CFO_{it+1} = \beta_0 + \beta_1 CSHRD_{it} + \beta_2 CSHPD_{it} + \beta_3 CSHTAX_{it} + \beta_4\, CSHINTIN_{it} + \beta_5 CSHINPD_{it} + \beta_6 CSHOTHERS_{it} + \beta_7 \Delta A/R_{it} + \beta_8 \Delta INV_{it} + \beta_9 \Delta A/P_{it} + \beta_{10} DEP_{it}\ \beta_{11} ACCOTHERS_{it} + \varepsilon_{it+1}$

T-statistics for all slopes calculated using White (1980) robust standard errors. VIF (variance inflation factor): an indicator for multicollinearity where values exceed 10. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Variables definitions: CFO is net cash flows from operating activities as reported in the statement of cash flows. $EARN$ is net (after tax) earnings before extraordinary items and discontinued operations. ACC is difference between $EARN$ and CFO. $\Delta A/R$ is the change in accounts receivable during a year. ΔINV is the change in inventory during a year. $\Delta A/P$ is the change in accounts payable during a year. DEP is depreciation and amortization. $ACCOTHERS$ is other accruals calculated as follows $EARN - (CFO + \Delta A/R + \Delta INV - \Delta A/P - DEP)$. $CSHRD$ is estimated cash received from customers and calculated as follows $CSHRD = SALES - \Delta A/R$. $CSHPD$ is estimated cash paid to suppliers and employees and calculated as follows $CSHPD = COGS - DEP + Selling\ and\ admin\ expenses + \Delta INV - \Delta A/P + \Delta other\ CA - \Delta other\ CL$. $CSHTAX$ is disclosed cash related to tax payments. $CSHINTIN$ is disclosed cash related to interest income. $CSHINTPD$ is disclosed cash related to interest payments. $CSHOTHERS$ is other operating cash flows calculated as $CFO - (CSHRD - CSHPD - CSHTAX + CSHINTIN - CSHINTPD)$. All the variables are scaled by average total assets. The sample spans 14 years from 2005 to 2018. All variables are trimmed at the 1 percent and 99 percent levels. Number of observations of GCC country firms = 2,732. Number of observations of non-GCC country firms = 1,824. GCC countries include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates. Non-GCC countries include Egypt, Jordan, Morocco, and Tunisia.

Table A.4: Bootstrap the difference of the Adjusted R-squared Statistics of the FEM for the GCC and Non-GCC Country Firms

	GCC Country Firms			Non-GCC Country Firms		
	Coefficient	**z-value**	**p-value**	**Coefficient**	**z-value**	**p-value**
Model 1 vs. Model 2	0.022***	3.43	0.001	0.015**	2.02	0.044
Model 3 vs. Model 1	0.001	0.77	0.442	0.007*	1.84	0.066
Model 3 vs. Model 2	0.023***	4.18	0.000	0.023***	3.02	0.003
Model 4 vs. Model 1	0.014***	3.27	0.001	0.010**	1.99	0.046
Model 4 vs. Model 3	0.012***	3.19	0.001	0.003	0.93	0.351
Model 5 vs. Model 2	0.029***	4.64	0.000	0.006	1.3	0.194
Model 6 vs. Model 1	0.031***	5.21	0.000	0.014**	2.24	0.025
Model 6 vs. Model 2	0.053***	6.23	0.000	0.029***	3.42	0.001
Model 6 vs. Model 3	0.030***	5.02	0.000	0.006	1.43	0.153
Model 6 vs. Model 4	0.018***	3.9	0.000	0.004	1.05	0.294
Model 6 vs. Model 5	0.024***	4.64	0.000	0.023***	2.95	0.003

This table reports bootstrapping the difference of the adjusted R-squared statistics of the FEM for the GCC and non-GCC country firms. The table shows the difference between the adjusted R-squared statistic of a model versus another (coefficient) and the bootstrap z-values of this difference and p-values estimated from the empirical distribution of the bootstrapped z-values. The number of bootstrap replications is 1000. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.5: The Mean and Median of the Firm-Specific Absolute Prediction Errors of the GCC Country Firms

	Mean						**Median**					
Prediction Models	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	0.055	**0.055**	**0.053**	**0.062**	**0.065**	**0.077**	**0.041**	**0.040**	**0.039**	**0.039**	**0.044**	**0.044**
Versus	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	z-value	z-value	z-value	z-value	z-value	z-value
Model 2	0.798 [0.80]						0.071					
Model 3	3.721*** [3.80***]	3.092*** [3.06***]					4.908***	5.287***				
Model 4	-3.184*** [-3.24***]	-3.460*** [-3.50***]	-4.235*** [-4.30***]				1.647*	0.876	-1.518			
Model 5	-5.033*** [-4.80***]	-5.623*** [-5.35***]	-6.349*** [-6.02***]	-0.983 [-0.95]			-4.449***	-6.492***	-8.753***	-5.273***		
Model 6	-7.536*** [-7.34***]	-7.634*** [-7.38***]	-8.245*** [-7.96***]	-4.485*** [-4.40***]	-4.669*** [-4.59***]	-	-5.434***	-6.110***	-8.341***	-8.936***	-2.004**	-
Number of Observations	**2,732**											

This table reports mean and median of the absolute prediction errors ($ABSE$) where CFO_{t+1} is predicted using six prediction models estimated using cross-sectional regression for firms in the GCC countries. In addition, the table reports the t-statistics and the z-values of the bootstrapping technique (in square brackets) that are employed to test whether there is a significance difference between the means of the $ABSE$ of the six models. Furthermore, the table shows the z-values of the Wilcoxon signed rank test that is employed to test if there is a significant difference between the medians of the $ABSE$ of the six models. A significance indicator next to t-statistics (z-values) means that mean (median) of $ABSE$ of a model in the vertical column is significantly lower (greater) than the mean of $ABSE$ of a model in the horizontal row. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table A.6: The Mean and Median of the Firm-Specific Absolute Prediction Errors of the Non-GCC Country Firms

	Mean						**Median**					
Prediction Models	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	0.062	**0.063**	**0.061**	**0.068**	**0.192**	**0.095**	**0.045**	**0.046**	**0.044**	**0.049**	**0.054**	**0.056**
Versus	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	t-statistics [z-value]	z-value	z-value	z-value	z-value	z-value	z-value
Model 2	-1.508 [-1.50]						-1.515					
Model 3	1.427 [1.38]	2.834*** [2.86***]					4.908***	4.660***				
Model 4	-4.579*** [-4.34***]	-3.711*** [-3.69***]	-5.766*** [-5.49***]				-3.158***	-1.712**	-4.841***			
Model 5	-1.581 [-1.59]	-1.562 [-1.57]	-1.591 [-1.60]	-1.504 [-1.52]			-7.186***	-6.361***	-8.254***	-4.011***		
Model 6	-7.318*** [-7.15***]	-6.993*** [-6.97***]	-7.533*** [-7.40***]	-6.055*** [-5.96***]	1.174 [1.19]	-	-9.671***	-8.986***	-11.122***	-8.565***	-3.592***	-
Number of Observations	**1,824**											

This table reports mean and median of the absolute prediction errors ($ABSE$) where CFO_{t+1} is predicted using six prediction models estimated using cross-sectional regression for firms in the non-GCC countries. In addition, the table reports the t-statistics and the z-values of the bootstrapping technique (in square brackets) that are employed to test whether there is a significance difference between the means of the $ABSE$ of the six models. Furthermore, the table shows the z-values of the Wilcoxon signed rank test that is employed to test if there is a significant difference between the medians of the $ABSE$ of the six models. A significance indicator next to t-statistics (z-values) means that mean (median) of $ABSE$ of a model in the vertical column is significantly lower (greater) than the mean of $ABSE$ of a model in the horizontal row. *, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix B: The Effect of Earnings Management, Unintentional Managerial Errors and Firm-Specific Characteristics on the Predictive Ability of Earnings and its Components in the GCC and Non-GCC Country Firms

Appendix B.1: The Effect of Earnings Management and Unintentional Managerial Errors on the Predictive Ability of Earnings and its Components in the GCC Country Firms

	Model 1c $ABSE_{t,EARN}$			Model 2c ACC_CONT_t			Model 3c $ABSE_{t,CFO}$		
Hausman Test	37.76***			15.14***			6.06**		
Adjusted R-squared	0.25			0.10			0.21		
F-statistics	11.71***			7.11***			4.67***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.177***	2.40	+	-0.074**	-1.93	-	-	-	-
$Innate\_ACC_{t-1}$	0.392***	3.55	+	-0.020*	-2.35	-	0.186*	1.75	+
RM_PROXY_{t-1}	0.069***	4.24	+	-0.022***	-3.10	-	0.039**	2.37	+
Constant	0.046***	15.15		0.002	1.42		0.049***	16.55	
Maximum VIF	1.04								
Mean VIF	1.03								
Number of Observations	1,482								

F-test of Coefficient Equality: Null Hypothesis	**F-statistics**	**p-value**
Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 1c	4.16**	0.016
Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 2c	1.03	0.356
Coefficients on $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 3c	1.83	0.177

This table presents regression results of three regression models using the FEM for the GCC country firms, where the FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; and unintentional managerial errors ($Innate\_ACC$) which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the modified Dechow and Dichev (2002) model, where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Appendix B.2: The Effect of Earnings Management and Unintentional Managerial Errors on the Predictive Ability of Earnings and its Components in the Non-GCC Country Firms

<table>
<tr><th rowspan="2"></th><th colspan="3">Model 1c</th><th colspan="3">Model 2c</th><th colspan="3">Model 3c</th></tr>
<tr><th colspan="3">$ABSE_{t,EARN}$</th><th colspan="3">ACC_CONT_t</th><th colspan="3">$ABSE_{t,CFO}$</th></tr>
<tr><td>Hausman Test</td><td colspan="3">13.14***</td><td colspan="3">8.10**</td><td colspan="3">3.80</td></tr>
<tr><td>Adjusted R-squared</td><td colspan="3">0.31</td><td colspan="3">0.09</td><td colspan="3">0.16</td></tr>
<tr><td>F-statistics</td><td colspan="3">7.81***</td><td colspan="3">5.56***</td><td colspan="3"></td></tr>
<tr><td>Wald chi square</td><td colspan="3"></td><td colspan="3"></td><td colspan="3">31.56***</td></tr>
<tr><td>Independent Variables</td><td>Coeff.</td><td>Robust t-statistics</td><td>Expected Sign</td><td>Coeff.</td><td>Robust t-statistics</td><td>Expected Sign</td><td>Coeff.</td><td>Robust z-statistics</td><td>Expected Sign</td></tr>
<tr><td>DIS_ACC_{t-1}</td><td>0.313***</td><td>2.61</td><td>+</td><td>-0.13**</td><td>-1.98</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>$Innate\_ACC_{t-1}$</td><td>0.570***</td><td>2.99</td><td>+</td><td>-0.07*</td><td>-2.60</td><td>-</td><td>0.810***</td><td>4.96</td><td>+</td></tr>
<tr><td>RM_PROXY_{t-1}</td><td>0.075***</td><td>3.13</td><td>+</td><td>-0.03***</td><td>-2.83</td><td>-</td><td>0.045***</td><td>2.60</td><td>+</td></tr>
<tr><td>Constant</td><td>0.043***</td><td>7.62</td><td></td><td>0.01</td><td>1.49</td><td></td><td>0.040***</td><td>8.17</td><td></td></tr>
<tr><td>Maximum VIF</td><td colspan="9">1.04</td></tr>
<tr><td>Mean VIF</td><td colspan="9">1.03</td></tr>
<tr><td>Number of Observations</td><td colspan="9">878</td></tr>
<tr><td colspan="5">F-test of Coefficient Equality:
Null Hypothesis</td><td colspan="3">F-statistics</td><td colspan="2">p-value</td></tr>
<tr><td colspan="5">Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 1c</td><td colspan="3">4.08</td><td colspan="2">0.017</td></tr>
<tr><td colspan="5">Coefficients on DIS_ACC_{t-1} = $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 2c</td><td colspan="3">6.80</td><td colspan="2">0.009</td></tr>
<tr><td colspan="5">Coefficients on $Innate\_ACC_{t-1}$ = RM_PROXY_{t-1} in Model 3c</td><td colspan="3">1.23</td><td colspan="2">0.294</td></tr>
<tr><td colspan="10">This table presents regression results of three regression models using the FEM for the non-GCC country firms, where the FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; and unintentional managerial errors ($Innate\_ACC$) which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the modified Dechow and Dichev (2002) model, where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.</td></tr>
</table>

Appendix B.3: Comprehensive Model for the GCC Country Firms

	Model 1d $ABSE_{t,EARN}$			Model 2d ACC_CONT_t			Model 3d $ABSE_{t,CFO}$		
Hausman Test	35.53***			19.19**			32.68***		
Adjusted R-squared	0.29			0.10			0.27		
F-statistics	15.08***			3.81***			15.67***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.170***	2.81	+	-0.066**	-2.07	-	-	-	-
$SIZE_{t-1}$	-0.004	-0.36	-	0.005	0.99	+	-0.006	-0.61	-
σCFO_{t-1}	0.250***	5.35	+	0.006	0.24	-	0.363***	7.79	+
$\sigma SAlES_{t-1}$	0.014	0.48	+	0.012	0.82	-	-0.005	-0.17	+
$OperCycle_{t-1}$	0.002*	1.87	+	0.001	0.95	-	0.003**	2.33	+
$NegEarn_{t-1}$	-0.021	-0.84	+	0.018***	3.09	-	-0.002	-0.18	+
AB_CFO	0.159***	7.36	+	-0.034***	-3.00	-	0.115***	5.31	+
AB_PROD	0.014	0.59	+	-0.027**	-2.15	-	-0.031	-1.33	+
AB_DISEXP	-0.037	-0.96	+	-0.003	-0.13	-	-0.008	-0.20	+
Constant	0.056	0.95		-0.034	-1.09		0.060	1.02	
Maximum VIF	1.90								
Mean VIF	1.28								
Number of Observations	1,482								

This table presents regression results of three regression models using the FEM for the GCC country firms, where the FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; $SIZE$ is natural logarithm of total assets; σCFO is the standard deviation of firm's CFO over the past five years scaled by average total assets; $\sigma SALES$ is the standard deviation of firm's sales over the past five years scaled by average total assets; $OperCycle$ is the natural logarithm of firm's operating cycle, where $OperCycle = 360(\frac{\Delta\ \text{A/R}}{\text{Sales}}) + 360(\frac{\Delta\ \text{INV}}{\text{COGS}})$; $NegEARN$ is the number of years out of the past five years, where firm reported $EARN$ < zero; AB_CFO refers to abnormal CFO scaled by lagged total assets; AB_PROD refers to abnormal production costs scaled by lagged total assets; AB_DISEXP refers to abnormal discretionary expenditures scaled by lagged total assets. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Appendix B.4: Comprehensive Model for the Non-GCC Country Firms

	Model 1d			Model 2d			Model 3d		
	$ABSE_{t,EARN}$			ACC_CONT_t			$ABSE_{t,CFO}$		
Hausman Test	26.73***			15.62*			20.35***		
Adjusted R-squared	0.36			0.08			0.33		
F-statistics	10.75***			2.37***			6.47***		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
DIS_ACC_{t-1}	0.267***	3.07	+	-0.124***	-2.59	-	-	-	-
$SIZE_{t-1}$	-0.030	-1.42	-	0.014	1.21	+	-0.015	-0.66	-
σCFO_{t-1}	0.255***	3.88	+	-0.035	-0.95	-	0.248***	3.56	+
$\sigma SAlES_{t-1}$	-0.030	-0.64	+	-0.023	-0.86	-	-0.046	-0.92	+
$OperCycle_{t-1}$	0.009***	4.82	+	-0.001	-0.75	-	0.007***	3.87	+
$NegEarn_{t-1}$	0.005	0.37	+	0.004	0.50	-	-0.005	-0.36	+
AB_CFO	0.145***	5.40	+	-0.041***	-2.77	-	0.107***	3.74	+
AB_PROD	-0.017	-0.57	+	-0.016	-1.00	-	-0.050	-1.63	+
AB_DISEXP	-0.035	-0.55	+	0.001	0.04	-	-0.041	-0.60	+
Constant	0.165	1.57		-0.062	-1.07		0.099	0.89	
Maximum VIF	1.90								
Mean VIF	1.28								
Number of Observations	878								

This table presents regression results of three regression models using the FEM for the non-GCC country firms, where the FE variable is firm. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the accruals contribution in predicting the one-year-ahead CFO (ACC_CONT), where ACC_CONT is the difference between the absolute prediction errors ($ABSE$) between two models: (i) CFO model and (ii) CFO and ACC model; the dependent variable in the third model is the absolute prediction error of CFO model ($ABSE_{CFO}$), where $ABSE_{it} = \left|\left(CFO_{i,t+1} - Predicted\ CFO_{i,t+1}\right)\right|$. The independent variables are discretionary accruals (DIS_ACC) computed from the modified Dechow and Dichev (2002) model; $SIZE$ is natural logarithm of total assets; σCFO is the standard deviation of firm's CFO over the past five years scaled by average total assets; $\sigma SALES$ is the standard deviation of firm's sales over the past five years scaled by average total assets; $OperCycle$ is the natural logarithm of firm's operating cycle, where $OperCycle = 360(\frac{\Delta\ A/R}{Sales}) + 360(\frac{\Delta\ INV}{COGS})$; $NegEARN$ is the number of years out of the past five years, where firm reported $EARN$ < zero; AB_CFO refers to abnormal CFO scaled by lagged total assets; AB_PROD refers to abnormal production costs scaled by lagged total assets; AB_DISEXP refers to abnormal discretionary expenditures scaled by lagged total assets. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Appendix C: The Effect of Conditional and Unconditional on the Predictive Ability of Earnings and Accruals in GCC and Non-GCC Country Firms

Appendix C.1: The Effect of Conditional Conservatism on the Predictive Ability of Earnings and Accruals in the GCC Country Firms

	Model 1a $ABSE_{t,EARN}$			**Model 2a** ACC_CONT_t		
Hausman Test	17.58***			33.23***		
Adjusted R-squared	0.25			0.15		
F-statistics	0.000			0.000		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$CONCOS_{t-1}$	0.002**	1.97	-	-0.001	-1.43	+
DIS_ACC_{t-1}	0.196**	2.19	+	-0.069*	-1.74	-
$Innate\_ACC_{t-1}$	0.402***	3.59	+	-0.166***	-2.66	-
RM_PROXY_{t-1}	0.048**	2.38	+	-0.038***	-5.02	-
Constant	0.047***	14.07		0.004**	1.99	
Maximum VIF	1.05					
Mean VIF	1.03					
Number of Observations	1,188					
F-test of Coefficient Equality: Null Hypothesis	F-statistics			p-value		
Coefficients on $CONCOS_{t-1}$,DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1}in Model (1a) are equal	6.15***					
Coefficients on DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1}in Model (2a) are equal				2.04		

This table presents regression summary statistics of estimation the regression models using the FEM for the GCC country firms. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $CONCOS$ refers to the firm-year conditional conservatism measured by Basu (1997) asymmetric earnings timeliness measure, as modified in Khan and Watts (2009); $CONCOS(C\_SCORE) = \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}$, where λ_1, λ_2, λ_3 and λ_4 are estimated from the following regression: $X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it}$;DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accrual quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEarn_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Appendix C.2: The Effect of Conditional Conservatism on the Predictive Ability of Earnings and Accruals in the Non-GCC Country Firms

	Model 1b $ABSE_{t,EARN}$			Model 2b ACC_CONT_t		
Hausman Test	8.35*			7.11*		
Adjusted R-squared	0.29			0.06		
F-statistics	0.000			0.4171		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$CONCOS_{t-1}$	-0.007**	-2.02	-	0.000	0.09	+
DIS_ACC_{t-1}	0.193	1.21	+	0.024	0.26	-
$Innate\_ACC_{t-1}$	0.562*	1.77	+	0.048	0.25	-
RM_PROXY_{t-1}	0.092***	3.35	+	-0.024**	-1.96	-
Constant	0.042	4.65		0.002	0.28	
Maximum VIF	1.10					
Mean VIF	1.06					
Number of Observations	627					
F-test of Coefficient Equality: Null Hypothesis	F-statistics			p-value		
Coefficients on $CONCOS_{t-1}$,DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1}in Model (1b) are equal	5.94***					

This table presents regression summary statistics of estimation the regression models using the FEM for the non-GCC country firms. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $CONCOS$ refers to the firm-year conditional conservatism measured by Basu (1997) asymmetric earnings timeliness measure, as modified in Khan and Watts (2009); $CONCOS(C\_SCORE)= \lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 Lev_{it}$, where λ_1, λ_2, λ_3 and λ_4 are estimated from the following regression: $X_{it} = \beta_0 + \beta_1 D_{it} + R_i(\mu_1 + \mu_2 SIZE2_{it} + \mu_3 M/B_{it} + \mu_4 LEV_{it}) + D_i * R_i(\lambda_1 + \lambda_2 SIZE2_{it} + \lambda_3 M/B_{it} + \lambda_4 LEV_{it}) + (\delta_1 SIZE2_{it} + \delta_2 M/B_{it} + \delta_3 LEV_{it} + \delta_4 D_{it} SIZE2_{it} + \delta_5 D_{it} M/B_{it} + \delta_6 D_{it} LEV_{it}) + \varepsilon_{it}$;DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accrual quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEarn_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Appendix C.3: The Effect of Unconditional Conservatism on the Predictive Ability of Earnings and Accruals in the GCC Country Firms

	Model 1c $ABSE_{t,EARN}$			Model 2c ACC_CONT_t		
Hausman Test	15.81***			32.18***		
Adjusted R-squared	0.25			0.15		
F-statistics	0.000			0.000		
Independent Variables	**Coeff.**	**Robust t-statistics**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$UNCONCOS_{t-1}$	-0.005	-0.41	-	0.014**	2.15	+
DIS_ACC_{t-1}	0.198**	2.24	+	-0.069*	-1.90	-
$Innate\_ACC_{t-1}$	0.437***	3.83	+	-0.193***	-2.82	-
RM_PROXY_{t-1}	0.046**	2.3	+	-0.036***	-4.83	-
Constant	0.046***	13.6		0.004**	1.99	
Maximum VIF	1.05					
Mean VIF	1.03					
Number of Observations	1,188					
F-test of Coefficient Equality: Null Hypothesis	F-statistics			p-value		
Coefficients on DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1} in Model (1c) are equal	6.10***					
Coefficients on $UNCONCOS_{t-1}$, DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1} in Model (2c) are equal				13.33***		

This table presents regression summary statistics of estimation the regression models using the FEM for the GCC country firms. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $UNCONCOS$ refers to the firm-year's unconditional conservatism calculated by the accumulation of non-operating accruals over the past five years deflated by beginning total assets multiplied by negative one following Givoly & Hayn (2000); DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accrual quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4\, OperCycle_{it} + \beta_5 NegEarn_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.

Appendix C.4:The Effect of Unconditional Conservatism on the Predictive Ability of Earnings and Accruals in the Non-GCC Country Firms

	Model 1d $ABSE_{t,EARN}$			**Model 2d** ACC_CONT_t		
Hausman Test	7.70			7.50		
Adjusted R-squared	0.13			0.02		
chi2	0.000			0.496		
Independent Variables	**Coeff.**	**Robust z-value**	**Expected Sign**	**Coeff.**	**Robust t-statistics**	**Expected Sign**
$UNCONCOS_{t-1}$	-0.025	-1.77	-	0.009	1.37	+
DIS_ACC_{t-1}	0.326***	2.73	+	-0.021	-0.24	-
$Innate\_ACC_{t-1}$	0.590***	2.61	+	0.074	0.62	-
RM_PROXY_{t-1}	0.061***	3.87	+	-0.006	-1.17	-
Constant	0.043***	6.51		0.000	0.03	
Maximum VIF	1.06					
Mean VIF	1.03					
Number of Observations	627					
F-test of Coefficient Equality: Null Hypothesis	F-statistics			p-value		
Coefficients on $UNCONCOS_{t-1}$,DIS_ACC_{t-1} , $Innate\_ACC_{t-1}$ and RM_PROXY_{t-1}in Model (1d) are equal	29.76***					

This table presents regression summary statistics of estimation the regression models using the FEM for the non-GCC country firms. The dependent variable in the first model is the absolute prediction error of $EARN$ model ($ABSE_{EARN}$); the dependent variable in the second model is the ACC contribution in predicting one-year-ahead CFO (ACC_CONT). The independent variables are $UNCONCOS$ refers to the firm-year's unconditional conservatism calculated by the accumulation of non-operating accruals over the past five years deflated by beginning total assets multiplied by negative one following Givoly & Hayn (2000); DIS_ACC refers to discretionary accruals computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005); $Innate\_ACC$ refers to the unintentional managerial errors which is the predicted values from regressing innate firm-specific characteristics on accruals quality computed from the Dechow and Dichev (2002) model, as modified in Francis *et al*. (2005), where $Innate\_ACC = \beta_0 + \beta_1 SIZE_{it} + \beta_2 \sigma CFO_{it} + \beta_3 \sigma SALES_{it} + \beta_4 OperCycle_{it} + \beta_5 NegEARN_{it}$; RM_PROXY refers to aggregate real earnings management proxy, where $RM\_PROXY = -AB\_CFO - AB\_DISEXP + AB\_PROD$. T-statistics for all slopes calculated using White (1980) robust standard errors. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. VIF is an indicator for multicollinearity where values exceed 10.